

# Oak-galls in Britain

## by Robin Williams



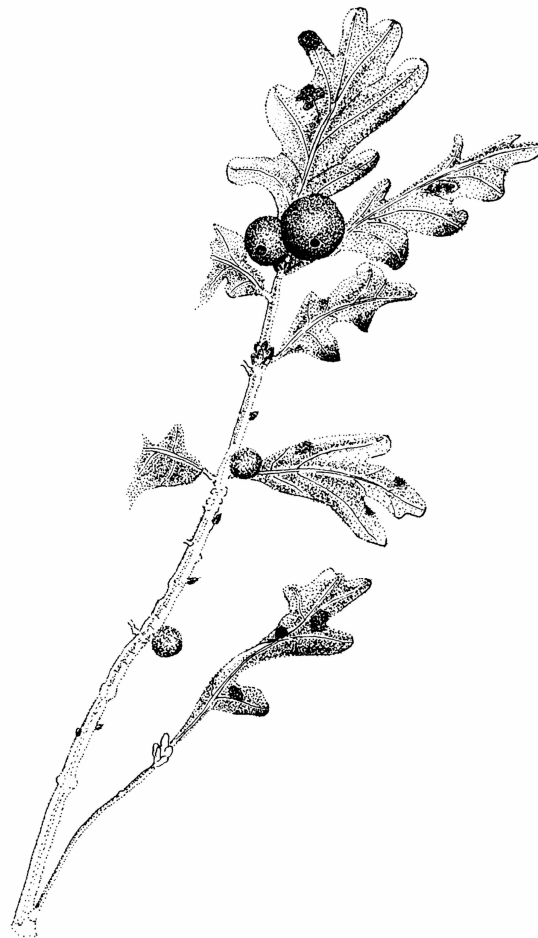
*Torymus auratus* ♀, reared from Marble-gall

photo: robin williams

## volume two - appendices

**Volume 2, 'section three'**  
**oak-galls in Britain**

**Appendices**  
**with full insect descriptions**



# Section three

## appendices

(revised 28/7/2010)

### Contents

	PAGE
A. FULL DESCRIPTIONS	
<b>Causers</b>	A3
Cynipids	A4
Mites	A83
Moths	A84
Bugs	A86
Flies	A88
<b>Inquilines</b>	A89
<b>Parasitoids</b>	A111
Chalcids	A112
Ichneumons	A169
Diapriids	A174
B. SUMMARY OF IDENTIFICATION POINTS	A176
RATIOS, MEASUREMENTS & SHORT DESCRIPTIONS	
Hymenopteran gall-causers	A177
Hymenopteran inquilines	A182
Hymenopteran gall-parasitoids	A184
C. GLOSSARY OF TECHNICAL TERMS	A190
Drawings showing insect structure	A190
Some important terms	A192
Behavioural terms	A199
Classification	A200
Some typical <b>microsculpture</b>	A202



	PAGE
D. SOURCES OF INFORMATION	A203
Some useful addresses	A203
Suppliers	A203
Societies	A204
People - thanks	A205
Support - thanks	A205
Papers/Articles	A206
Books	A209
CD Rom	A211
E. CONNOLD - NAMES FROM 'BRITISH OAK GALLS'	A212
F. NUMBERS OF INSECTS MEASURED	A214
G. FIRST DOCUMENTED RECORDS OF INSECTS IN GALLS	A218



*nb. Low-resolution digital microscopic photographs have been inserted in the descriptions on causers and inquilines – where I have specimens. They serve only as a guide to the shape of the various species; but should be helpful in seeking to become familiar with of these often-difficult insects. These pictures are not to scale; it was felt that it was more useful to show them at much the same size fro comparative detail and shape. Sizes are given under each description*



# Causers

SPECIES	PAGE
<b>Cynipids</b>	
Andricus	A4
Aphelonyx	A46
Biorhiza	A48
Callirhytis	A51
Cynips	A55
Neuroterus	A65
Trigonaspis	A80
<b>Acari (mites)</b>	<b>A83</b>
<b>Lepidoptera (moths)</b>	<b>A84</b>
<b>Hemiptera (bugs)</b>	<b>A86</b>
<b>Diptera (flies)</b>	<b>A88</b>



## **Andricus, Hartig 1840 (some common factors)**

SHORT PRONOTUM

RADIAL CELL OPEN

FACE WITH AT MOST A FEW RADIATING STRIAE

PROPODEUM WITH 2 LONGITUDINAL CARINAE ENCLOSING A 'DIFFERENT' AREA

FEMALES - VENTRAL GASTRAL SPINE SLENDER, SUB-BASAL HAIRS NOT REACHING  
END

MALES - TARSAL CLAW WITH BASAL LOBE

- SCUTELLAR FOVEAE CLEARLY SEPARATED

- NO SUB-OCULAR CARINAE



**Andricus albopunctatus** (Schlechtendal 1870) - Agamic generation only  
**♂ X 1 - Spotted-bud gall causer**

*Impression:* CHESTNUT & DARK HEAD, CHESTNUT & DARK-STRIPED THORAX; BLACK & GOLDEN GASTER; GOLDEN-BROWN LEGS; DARK ANTENNAE. FOURTEEN antennal segments.

*Length:* Body **2.9mm**

*Ratios:* Wings/Body **142%**

*Antennae:* dark with some gold at base of third; longish 3rd; slender with slight taper; whorls of silvery hair.

*Head:* bright chestnut with dark round mouth and between ocelli; inconspicuous short silvery hair; straw-coloured ocelli.

*Eyes:* deep brown, smallish.

*Mouthparts:* golden brown mandibles with dark tips; short, dark appendages.

*Thorax:* chestnut & dark brown with contrasting dark lines between plates; bright mesoscutum with dark brown patches fore and aft, glossy with some faint coriaceous sculpture, virtually glabrous above; ochre tegulae; full-length notaulices; no median line, or only one or two faint pits; contrasting black separated foveae; bright scutellum with rugose sculpture & short stiff hairs; mesepimeron glossy with faint longitudinal striae or folds at edges.

*Legs:* golden-brown, with short, stiff, silvery hair.

*Wings:* long, with neutral brown veins and hairs, neither of which are especially prominent.

*Gaster:* glossy rich chestnut above and on much of sides; translucent golden testaceous below; black on tip of final segment; long pointed ventral spine; clearly segmented.



*Andricus amenti* Giraud 1859 - Sexual generation only

♀ X 1 - **Hairy-catkin gall causer**

*Impression:* DARK YELLOW HEAD; YELLOW-BROWN THORAX; REDDISH-YELLOW GASTER; YELLOW-BROWN LEGS & ANTENNAE. THIRTEEN antennal segments.

*Length:* Body **2.4mm**

*Ratios:* Wings/Body **150%**

*Antennae:* yellow-brown; slender, not tapered; 3rd long and slender; scape & pedicel fattish, but not globular.

*Head:* dark yellow all over except for darker patch blending in round vertex; lightly granulated surface all over.

*Eyes:* smallish, dark brown in contrast to head.

*Mouthparts:* pale yellow appendages; tiny dark brown tips to yellow mandibles.

*Thorax:* yellow-brown; mesoscutum lightly longitudinally sculpted with few significant hairs; full-length notaulices; no median scutal line; scutellum sculpted but hairless; foveae clearly marked & separated; mesepimeron dull with pale hairs and light indeterminate sculpture.

*Legs:* darker than male, translucent yellow-brown at top, paler below; hairy.

*Wings:* pale yellow veins & hairs; clear.

*Gaster:* dark reddish-yellow, with darker tip; un-segmented; smooth, semi-translucent, hairless; long slender ovipositor sheath projection with tufts of hair at tip.

♂ X 1

*Impression:* YELLOW & BROWN HEAD; CHESTNUT-YELLOW & BROWN THORAX; DARK & PALER YELLOW-BROWN GASTER; TRANSLUCENT YELLOW LEGS & YELLOW ANTENNAE. FIFTEEN antennal segments.

*Length:* Body **2.8mm**

*Ratios:* Wings/Body **148%**

*Antennae:* dull yellow with pale hairs; 3rd short, quite fat and straight; not tapered; globular pedicel, short fat tapered scape.

*Head:* rich yellow with dark brown vertex fading round ocellar triangle; pale contrasting ocelli and pale hairs.

*Eyes:* dark brown, contrasting with head.

*Mouthparts:* small yellow appendages, yellow mandibles with tiny contrasting dark tips.

*Thorax:* reddish-yellow, with reddish-brown beneath; very lightly sculpted giving overall smooth effect to mesoscutum; full-length notaulices; short broad ½-length median scutal line at the front; mesopleuron dull, with indeterminate sculpture and pale hairs.

*Legs:* entirely translucent yellow, with pale hairs.

*Wings:* pale yellow veins and hairs; clear.

*Gaster:* dark yellow-brown above, paler beneath; blocky, glossy; un-segmented; pale hairs round the end, below.





**Andricus aries** (Giraud 1859) - agamic generation only

**♂ X 20 - Rams-horn gall causer**

*Impression:* GOLDEN-CHESTNUT HEAD; ORANGE-BROWN THORAX, GASTER, LEGS & ANTENNAE.

**THIRTEEN** antennal segments.

*Length:* Body **3.4mm** (2.2-4.5)

*Ratios:* Wings/Body **126%**.

*Antennae:* all orange-brown, no taper; fat scape; small, longer than wide, pedicel; straight, tapered 3rd; covered in inconspicuous hairs.

*Head:* small; pale chestnut-gold; reticulated vertex, hairy.

*Eyes:* black, medium.

*Mouthparts:* mandibles testaceous, with black tips; appendages pale testaceous.

*Thorax:* evenly orange-brown; mesoscutum granulate and very hairy; full length, narrow notaulices; tegulae pale translucent; median line short, wide & faint; scutellum coarsely rugulose; separated mid-brown foveae; conspicuous, dark brown propodeum with parallel horizontal carinae; mesopleuron smooth but very hairy, hairs from small punctuations.

*Legs:* all translucent orange, with much white hair.

*Wings:* clear; open radial cell; pale veins & hairs.

*Gaster:* glossy orange-brown; segmented; extensive bands of long pale hairs and tiny punctures on edges of segments; bulky; long, slender ventral spine with sparse hairs.



**Andricus callidoma** (Hartig 1841) - Agamic & sexual generations

♀ X 6 - **Tufted gall causer**

*Impression:* MID-BROWN HEAD & THORAX; YELLOW GASTER, LEGS & ANTENNAE. THIRTEEN antennal segments.

*Length:* Body **1.5mm** (1.2-2.1)

*Ratios:* Wings/Body **135%**

*Antennae:* yellow, not tapered, hairy.

*Head:* dark brown, smooth; pale hairs.

*Eyes:* large, dark brown.

*Mouthparts:*

*Thorax:* smooth, mid-brown to yellow; some pale hairs; full-length notaulices.

*Legs:* all yellow except for dark claws; little sculpting, pale hairs.

*Wings:* pale veins and hairs.

*Gaster:* dark yellow; one large segment but others strongly visible at back; glossy, smooth, unsculpted.

♂ X 6

*Impression:* YELLOW-BROWN BODY, WITH CONTRASTING DARK EYES; YELLOW LEGS & ANTENNAE. FIFTEEN antennal segments.

*Length:* Body **1.5mm** (1.4-1.5)

*Ratios:* Wings/Body **153%**

*Antennae:* pale yellow; slight taper, hairy.

*Head:* translucent yellow-brown; small with lots of pale hairs.

*Eyes:* medium-sized, dark brown, contrasting with head colour.

*Mouthparts:*

*Thorax:* translucent yellow-brown; smooth with pale hairs; full-length notaulices.

*Legs:* all yellow, except for dark claws; unsculpted.

*Wings:* pale veins, with mid-brown hairs.

*Gaster:* smooth; translucent mid yellow-brown; part segmented.



*oak-galls - volume two*

*descriptions/causers*

**Andricus callidoma**

**♂ - Stalked-spindle gall causer**

Impression:

Length: **Body mm.**

Ratios: **Wings/Body %.**

Antennae:

Head:

Eyes:

Mouthparts:

Thorax: **no median line.**

Legs:

Wings:

Gaster:



**Andricus corruptrix** (Schlechtendal 1870) - Agamic & sexual generations

♀ X 18

**Impression:** BLACK HEAD & THORAX; BLACK-BROWN GASTER; BROWN TO DIRTY YELLOW LEGS; DARK BROWN ANTENNAE. THIRTEEN antennal segments.

**Length:** Body 1.9mm (1.7-2.0)

**Ratios:** Wings/Body 157%

**Antennae:** black scape; long fat translucent brown pedicel, flagellum brown with pale hairs; but varies from dark to lighter in different insects; long, straight 3<sup>rd</sup>; slight taper.

**Head:** black; vertex heavily reticulated; temples same width as eyes; short, sparse hairs; ocelli mid-brown.

**Eyes:** black, mid-size.

**Mouthparts:** dark-brown appendages and very dark brown mandibles.

**Thorax:** black; mesoscutum reticulate, fading into some longitudinal striae in middle at back; full-length notaulices; no median line, or only slight dent at back; translucent dark brown tegulae; scutellum with deep reticulated-rugose sculpture, rounded; separated foveae; mesopleuron dull and fully longitudinally striated.

**Legs:** hairy dark brown coxae and femora; tapering to dirty yellow – but degree of colouring varies.

**Wings:** dark short brown hairs & dark brown veins; clear; open radial cell.

**Gaster:** shiny black-brown, with pale edges at back; segmented; deep; band of pale hairs at back; almost square, with long ovipositor sheath; no obvious ploughshare beneath.



♂ X 16

**Impression:** ALL BLACK BODY; DARK BROWN ANTENNAE; BROWN TO DIRTY YELLOW LEGS. FOURTEEN antennal segments.

**Length:** Body 1.8mm (1.4-2.1)

**Ratios:** Wings/Body 173%

**Antennae:** very dark brown scape, long mid-brown pedicel; flagellum dark brown; 3<sup>rd</sup> expanded at outer end; heavily-ridged sensillae; tear-shaped segments.

**Head:** black; heavily reticulated, including vertex; temples same width as eyes; short, sparse hairs; bright chestnut ocelli.

**Eyes:** black, large.

**Mouthparts:** dark-brown appendages and very dark brown mandibles

**Thorax:** black; mesoscutum reticulated, changing to longitudinal striae at back (view from side); full-length notaulices; no median line, or only slight trace at rear; black-brown tegulae; scutellum with deep black, coarse reticulation with coarser reticulation round side; separated foveae; mesopleuron longitudinally striate with bottom third much reduced.

**Legs:** dark brown coxae & femora, with pale joints; rest dirty yellow.

**Wings:** clear; short, coarse dark hairs and dark neutral veins; radial cell open.

**Gaster:** black and glossy; slender, pointed; single segment; few large hairs at front.



*Andricus corruptrix*

♂ X 15

*Impression:* BRIGHT ORANGE-BROWN BODY, LEGS & ANTENNAE; VARIABLE FROM LIGHT TO DARK. THIRTEEN antennal segments.

*Length:* Body 3.7mm (2.8-4.2)

*Ratios:* Wings/Body 123%

*Antennae:* large, clubbed scape; pedicel longer than wide; straight 3rd; all orange-brown, hairy, very slightly tapered and slender.

*Head:* small, orange-brown; granulate with pale hairs; small mid-brown ocelli.

*Eyes:* mid-size, black;.

*Mouthparts:* chestnut mandibles; orange-brown appendages.

*Thorax:* hunched, orange-brown, except for black propodeum; hairy at sides and on scutellum, less on top; mesoscutum coriaceous/granulate; narrow full-length notaulices; from inconspicuous short median line to none; dirty neutral brown heavily granulated scutellum; black, sharp, clearly separated glossy foveae; mesopleuron with longitudinal striae at top, glossy and punctate below.

*Legs:* orange-brown; hairy.

*Wings:* clear with dark brown veins; pale hairs.

*Gaster:* orange-brown except for small blended-in dark brown spot, on top at front; fat, segmented; separated by bands of pale hairs at back of each segment; glossy, translucent; faint punctuations on rear and beneath; thin ventral spine with sparse hairs.



***Andricus curvator*** Hartig 1840 - Agamic & sexual generations

♀ X 12 - **Curved-leaf gall causer**

Impression: BLACK BODY; YELLOW-BROWN LEGS; PALER & DARKER CHESTNUT ANTENNAE.

FOURTEEN antennal segments.

Length: Body 2.3mm (1.9-2.8)

Ratios: Wings/Body 131%

Antennae: pale chestnut, darkening after first few segments; short straight 3rd segment; tapered.

Head: black, shiny.

Eyes: dark neutral, large.

Mouthparts: pale small appendages; dark mandibles.

Thorax: glossy black; mesoscutum smooth, with line of hairs along line of full-length notaulices; no median line; tegulae dark brown; scutellum granular with large reticulation, glossy; foveae almost separated; propodeum with near parallel carinae; mesopleuron smooth & glossy.

Legs: black coxae, remainder yellow-brown, with much brown in middle of femur and tibia.

Wings: prominent neutral brown veins and hairs.

Gaster: black with some paler tinges on edges; segmented; fat and deep; glossy.



♂ X 14

Impression: BLACK BODY; LARGELY DIRTY YELLOW LEGS; DARK YELLOW ANTENNAE. FIFTEEN antennal segments.

Length: Body 2.0mm (2.0-2.3)

Ratios: Wings/Body 138%

Antennae: darker scape; the rest yellow/chestnut, darkening after initial few segments; slightly curved 3<sup>rd</sup> with sharp, flat top; not tapered.

Head: glossy black, with sparse pale hairs.

Eyes: very dark brown; large.

Mouthparts: dark mandibles & pale appendages.

Thorax: glossy black; mesoscutum smooth with line of hairs along line of full-length notaulices; no median line; tegulae dark brown; scutellum granular with large reticulation, glossy; foveae almost separated; propodeum with near parallel carinae; mesopleuron smooth & glossy.

Legs: dirty pale yellow, with slight brown tinges to middle of tibiae & femora; coxae darker.

Wings: strong brown to paler veins, with medium brown hairs.

Gaster: very glossy black, with short chestnut petiole; segmented but not obviously so.



*Andricus curvator*

**♂ X 1 - Collared-bud gall causer**

*Impression:* DARK BROWN HEAD; BLACK THORAX; CHESTNUT GASTER, LEGS & ANTENNAE.

**FOURTEEN** antennal segments.

*Length:* Body **2.8mm**

*Ratios:* Wings/Body **125%**

*Antennae:* chestnut, straight 3rd; not tapered.

*Head:* smallish, slight gloss; dark brown to black, moderately hairy; definite alutaceous micro-sculpture; small pale ocelli.

*Eyes:* smallish, dark brown.

*Mouthparts:* chestnut appendages and mandibles, contrasting with head.

*Thorax:* glossy, very dark brown-black to paler black-striped; mesoscutum hairy in parts; little micro-sculpture; full-length notaulices; no median line; tegulae pale chestnut; separated dark chestnut foveae; heavily rugose scutellum; mesopleuron glossy black.

*Legs:* all pale chestnut, with darkened coxae.

*Wings:* pale neutral veins and hairs.

*Gaster:* deep chestnut, with dark markings; segmented; diamond-shaped.



***Andricus fecundator*** (Hartig 1840) - agamic & sexual generations

♀ X 6 - **Hairy-catkin gall causer**

**Impression:** ALL BLACK or RED-BROWN BODY; BROWN & YELLOW LEGS; GOLDEN-BROWN ANTENNAE. THIRTEEN or FOURTEEN antennal segments.

**Length:** Body 1.6mm (1.4-1.8)

**Ratios:** Wings/Body 141%

**Antennae:** dark gold scape with darker base; gold flask-shaped pedicel; the rest gold darkening towards the tip; short, straight 3rd; tapered.

**Head:** black, lightly sculpted, shiny; translucent yellow ocelli.

**Eyes:** very dark brown, mid-sized.

**Mouthparts:** yellow appendages with dark tip, testaceous mandibles.

**Thorax:** black; mesoscutum smooth, semi-glossy, with light sculpture in parts & a few hairs towards the back; full-length notaulices; weak 3/4 length median line; black tegulae; granular, hairy scutellum; separated black foveae; mesopleuron smooth & shiny, with some longitudinal striae on sides.

**Legs:** femora brown, the rest dark yellow.

**Wings:** clear; mid-brown heavy veins; short brown hairs.

**Gaster:** black, with dark chestnut at rear and extreme front; blocky, segmented but not compressed sideways; semi-glossy with slight sculpture; longish testaceous ovipositor sheath.



♂ X 4

**Impression:** BLACK HEAD & THORAX; DARK BROWN GASTER; YELLOW-BROWN LEGS; BROWN ANTENNAE; OVERALL COLOUR CAN VARY TO PALER BROWN TINTS. FOURTEEN antennal segments.

**Length:** Body 1.6mm (1.3-1.8mm)

**Ratios:** Wings/Body 144%.

**Antennae:** mid-brown flagellum; very dark brown scape, long mid-brown pedicel; tear-shaped segments; slightly tapered.

**Head:** black; heavily reticulated, including vertex; pale hairs; ocelli chestnut.

**Eyes:** large, black.

**Mouthparts:** dark brown appendages, very dark brown mandibles.

**Thorax:** black; mesoscutum reticulated, changing to longitudinal striae at back (view from side), no hairs on top; full-length notaulices; faint median line, or none; black-brown tegulae; scutellum black with coarse reticulation, very coarse round edge; separated foveae; mesopleuron longitudinally striate, with lowest part reducing to smooth.

**Legs:** dark brown coxae & femora tapering to dirty yellow; pale joints.

**Wings:** clear; dark neutral brown veins; short, dark, coarse, can be paler.

**Gaster:** glossy dark brown; single main segment; slender, pointed & tiny; few large hairs at front.





*Andricus fecundator*

**♂ X 9 - Artichoke gall causer**

**Impression:** BLACK HEAD & THORAX; BRIGHT CHESTNUT GASTER; BROWN LEGS; DARK ANTENNAE. FOURTEEN antennal segments.

**Length:** Body 3.5mm (2.2-4.8)

**Ratios:** Wings/Body 127%

**Antennae:** dark brown-black; covered with short hairs; long 3rd; slight taper.

**Head:** black; lightly sculpted, with dark hairs; dark ocelli.

**Eyes:** mid-brown, small.

**Mouthparts:** pale appendages, dark mandibles.

**Thorax:** shiny black; lightly sculpted; very hairy; mesoscutum shiny with fanned longitudinal lines of hairs; full-length notaulices; no median line; chestnut tegulae; scutellum with rugose sculpture and much hair running lengthwise; separated black foveae; mesopleuron striate & hairy.

**Legs:** dark brown getting slightly paler lower down; hairy.

**Wings:** pale brown veins and hairs.

**Gaster:** bright chestnut, with diagonal darker stripes from half way down; semi-translucent.



*Andricus glandulae* (Hartig 1840) - agamic & sexual generations

♀ X 3

**Impression:** BROWN & YELLOW HEAD; MID-BROWN THORAX; TWO-TONE BROWN GASTER; BEIGE-YELLOW LEGS; YELLOW TO DARKER ANTENNAE. THIRTEEN antennal segments.

**Length:** Body 1.5mm (1.4-1.6)

**Ratios:** Wings/Body 139%

**Antennae:** yellow at base toning to darker tip; not tapered.

**Head:** mid-brown toning to deep yellow; smooth & slight sheen; mid-sized; ocelli pale yellow-chestnut.

**Eyes:** mid-size, dark brown.

**Mouthparts:** appendages and mandibles very pale.

**Thorax:** rich mid-brown; slight but hunched; mesoscutum smooth and virtually unsculpted; full-length notaulices; no median line; pale chestnut tegulae; separate self-coloured foveae; scutellum deeply rugose; smooth mesopleuron.

**Legs:** mid beige-yellow, semi-translucent.

**Wings:** yellow veins and hairs.

**Gaster:** pale and darker bright brown; huge, diamond-shaped; shining and un-segmented.



♂ X 10

**Impression:** TRANSLUCENT YELLOW-BROWN HEAD; DARK YELLOW-BROWN THORAX; MID-BROWN TO DARK GASTER; YELLOW LEGS & ANTENNAE. FIFTEEN antennal segments.

**Length:** Body 1.6mm (1.5-1.8mm)

**Ratios:** Wings/Body 150%

**Antennae:** dark bright yellow; not tapered.

**Head:** yellow with darker patch on vertex; fluffy; shiny with little sculpture, but granulated in part; ocelli match rest.

**Eyes:** dark brown, medium-sized.

**Mouthparts:** pale mandibles and appendages.

**Thorax:** dark yellow; shiny and smooth; mesoscutum lightly sculpted, translucent orange-yellow with longitudinal chestnut centre streak showing beneath the surface; full-length notaulices; no median line; tegulae dark yellow; separate self-coloured foveae; scutellum comparatively smooth & translucent, deep orange-yellow; smooth deep orange-yellow mesopleuron.

**Legs:** pale, rich yellow.

**Wings:** dark yellow veins and hairs.

**Gaster:** rich, mid-brown; quite large & diamond-shaped; glossy.



*Andricus glandulae*

**♂ X 4 - Thatched gall causer**

*Impression:* GOLDEN BROWN BODY & LEGS; BROWN ANTENNAE. FOURTEEN antennal segments.

*Length:* Body **3.3mm** (3.2-3.4)

*Ratios:* Wings/Body **132%**

*Antennae:* brown, with paler joints, long pedicel and flask-shaped scape; long, thin, straight 3rd segment; covered with short hairs; slight taper.

*Head:* translucent golden-brown, finely reticulated, hairy round edges; contrasting dark chestnut ocelli.

*Eyes:* dark, medium sized.

*Mouthparts:* pale appendages and mandibles.

*Thorax:* mainly translucent yellow-brown; mesoscutum surrounded by black rim; full-length contrasting brown notaulices; no median line (though mark under the surface of the cuticle may look like one); tegulae gold-brown; scutellum round, shiny, heavily sculpted, hairy; black foveae, shiny, with leathery microsculpture; shiny mesopleuron with slight microsculpture, hairy.

*Legs:* translucent golden-brown, hairy.

*Wings:* translucent; brown hairs and rich brown veins.

*Gaster:* translucent golden-brown, heavily segmented; glossy; flat end; thin and high; long ovipositor sheath.



***Andricus grossulariae*** Giraud 1859 - sexual & agamic generations

♀ X 9

**Impression:** BLACK HEAD & THORAX; BLACK/BROWN GASTER; DARK LEGS; GOLD-BROWN ANTENNAE WITH DARK TIPS. THIRTEEN antennal segments.

**Length:** Body 2.1mm (1.9-2.3)

**Ratios:** Wings/Body 114%

**Antennae:** translucent gold-brown, with last 2 to 3 segments dark; scape flask-shaped, pedicel a little longer than wide; third straight, tapered and short; pale hairs; tapered.

**Head:** black; roughly rugose, including vertex; ocelli translucent golden-brown; well-defined mouth.

**Eyes:** large, black.

**Mouthparts:** translucent golden-chestnut mandibles with deep chestnut tips; dirty straw-coloured appendages.

**Thorax:** black; mesoscutum with transverse rugae at front, turning into rugae running back at 45° on each side of median line at back (*view from side/above*); full-length notaulices; wide ¼ length median line; tegulae translucent pale brown; scutellum with very coarse rugae mainly running longitudinally, hairless; glossy, separated, obvious foveae; mesopleuron covered in longitudinal striae, with reticulation between at front.

**Legs:** front pair all translucent dirty gold-brown; other pairs much darker brown to dull black; paler tarsi.

**Wings:** clear; mid-brown veins; slender, dark, unobtrusive hairs in profusion.

**Gaster:** black/brown; one main segment; glossy with a few pale hairs at front; deep and bulky; ventral spine long, slender & pointed, with sparse hairs.



♂ X 16

**Impression:** BLACK HEAD & THORAX; BLACK/BROWN GASTER; LARGELY YELLOW LEGS; YELLOW ANTENNAE. FOURTEEN antennal segments.

**Length:** 1.9mm (1.6-2.0)

**Ratios:** Wings/Body 143%

**Antennae:** translucent yellow, with last couple of segments darkened; scape fat, short pedicel slightly longer than wide; 3rd fat and short, slightly bent and expanded at top; pale sensillae.

**Head:** black, short, pale hairs; all reticulated/rugose; pale brown ocelli; clearly defined mouth.

**Eyes:** large, dark.

**Mouthparts:** chestnut mandibles with dark tips; golden-brown appendages.

**Thorax:** black; mesoscutum with strongly defined transverse rugae at front, changing at rear first to semi-circular swirls, then longitudinal striae (*view from side/above*); full-length notaulices; wide ¼ length median line; translucent pale brown tegulae; scutellum with very coarse rugae mainly running longitudinally, hairless; glossy, separated, obvious foveae; mesopleuron covered in longitudinal striae, with some reticulation at front.

**Legs:** front and middle legs all translucent gold with dark claws; back legs with top half of coxae dark brown, darker tibiae.

**Wings:** clear; dark brown veins; short & coarse dark hairs.

**Gaster:** dark brown/black; glossy, un-segmented; small; pointed or with open end.



*Andricus grossulariae*

♂ X 68

*Impression:* DARK & CHESTNUT HEAD; DARK CHESTNUT & BLACK THORAX; CHESTNUT GASTER; DARK & CHESTNUT LEGS; CHESTNUT WITH DARK ANTENNAE; VARIABLE IN INTENSITY OF COLOUR. THIRTEEN antennal segments.

*Length:* **Body 3.1mm** (2.5-4.3)

*Ratios:* Wings/Body **130%**

*Antennae:* first half of segments dark with more or less pale ends; final seven or so segments all dark; scape & pedicel dark; antennae vary in colour intensity; modest taper.

*Head:* chestnut with black clypeus, round mouth and up face, or much darker all over; masses of silver pubescence over long striae radiating out from mouth up to eyes and on first part of cheeks (*difficult to see beneath the pubescence - persist*); translucent chestnut ocelli.

*Eyes:* dark, medium-sized.

*Mouthparts:* mandibles chestnut with dark tips; appendages translucent pale chestnut.

*Thorax:* black with some chestnut, plus prolific silver pubescence; pronotum mainly chestnut; mesoscutum dark with more or less chestnut blended in longitudinal stripes, masses of pubescence; full-length notaulices; indistinct but broad median line at back, half-length or less; tegulae translucent chestnut; foveae black, glossy, separated; scutellum circular, mainly dark chestnut, rugose with long pubescence; propodeum black, heavily sculpted; mesopleuron black top, rich brown below, with heavy pubescence.

*Legs:* heavy pubescence; variable colouring, from pale chestnut to dark coxae; femora from black striped with chestnut to pale chestnut; dark tibiae with darker or paler tarsi.

*Wings:* clear, with dark veins & hairs; open radial cell.

*Gaster:* chestnut; smooth & segmented; pale hairs on first and last segments only; short, blunt, pale ventral spine, with short, sparse hairs; no puncturation.



*Andricus inflator* Hartig 1840 - agamic & sexual generations

♀ X 5 - **Twig gall causer**

**Impression:** DARK BROWN HEAD & THORAX; TRANSLUCENT RED-BROWN GASTER; TESTACEOUS LEGS; YELLOW ANTENNAE. FOURTEEN antennal segments.

**Length:** Body 3.6mm (3.1-4.4)

**Ratios:** Wings/Body 145%

**Antennae:** deep yellow, with short-pale hairs; fat rounded pedicel & short, fat scape; 3rd slender, straight & shortish; long & thin; not tapered.

**Head:** dark brown all over; largely unsculpted and shiny; chestnut ocelli.

**Eyes:** dark brown, mid-size.

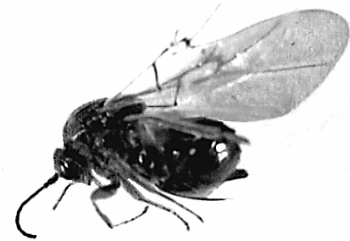
**Mouthparts:** yellow appendages; yellow mandibles with dark tips.

**Thorax:** dark brown; mesoscutum semi-glossy with light sculpture and some hair round sides; full-length notaulices; no obvious median line; black tegulae; black separate foveae; heavily granulated hairy scutellum; mesopleuron semi-glossy, with sculpture in middle.

**Legs:** testaceous, with dark internals showing; lightly hairy.

**Wings:** pale beige veins and hairs; clear.

**Gaster:** dark, translucent red-brown with darker tip; blocky; segmented, but not obviously so.



♂ X 1

segments.

**Length Impression:** DARK BROWN BODY; YELLOW-BROWN LEGS & ANTENNAE. FIFTEEN or SIXTEEN antennal: Body 2.8mm

**Ratios:** Wings/Body 150%

**Antennae:** deep yellow-brown, with lines of white sensillae and close pale hairs; fat rounded pedicel & short, fat scape; whole very long and slender; 3rd straight, tubular and fattish.

**Head:** dark brown, mid neutral-brown round mouth; shiny, largely unsculpted

**Eyes:** dark brown.

**Mouthparts:** very pale beige appendages, beige mandibles with tiny dark tips.

**Thorax:** dark brown; sculpted, semi-glossy mesoscutum with hairs at edge; full-length notaulices; remains of very short median scutal line at back; hairy granulated scutellum; mesopleuron high-gloss, with hairs at bottom only.

**Legs:** rich yellow-brown, with dark coxae and dark claws.

**Wings:** pale neutral veins and hairs; clear.

**Gaster:** dark brown; heavily segmented, with toothed edges; very deep & short; glossy un-sculpted; hairless.



**Andricus inflator**

**♂ X 4 - Globular gall causer**

**Impression:** VARIABLE COLOURING; BLACK TO DARK BROWN HEAD & THORAX; CHESTNUT OR DARKER GASTER; CHESTNUT-TINGED YELLOW LEGS; PALER OR DARKER ANTENNAE. FOURTEEN or FIFTEEN antennal segments.

**Length:** Body **1.9mm**

**Ratios:** Wings/Body **143%**

**Antennae:** yellow-chestnut or darker; slender; third segment thin & long; tapered.

**Head:** black to dark brown; semi-glossy with coriaceous sculpture; pale hairs; ocelli translucent pale chestnut.

**Eyes:** very dark brown; mid-sized.

**Mouthparts:** pale chestnut appendages and mandibles.

**Thorax:** black to brown with paler patches; lightly coriaceous mesoscutum with sparse lines of pale hairs; full-length notaulices; no median line; dirty testaceous tegulae; separated shallow foveae; well-sculpted hairy scutellum; out-bowed carinae on propodeum; mesopleuron high-gloss and slightly sculpted.

**Legs:** dark chestnut; hairy.

**Wings:** clear; dark chestnut veins with pale hairs; colour of veins tends to bleed into surround; brown cloud at the bottom of forewing.

**Gaster:** chestnut or more uniformly dark; glossy; segmented; slender but blunt-ended ventral spine with light fringe of hairs up sides.



***Andricus kollari*** (Hartig 1843) - agamic & sexual generations

♀ X 5

**Impression:** BLACK HEAD & THORAX; MAINLY DARK BROWN GASTER; TAPERED BROWN/YELLOW LEGS; DIRTY YELLOW ANTENNAE. THIRTEEN antennal segments.

**Length:** Body 1.8mm (1.5-1.9)

**Ratios:** Wings/Body 158%

**Antennae:** dirty yellow-brown; dark brown scape; club-shaped, straight 3rd segment; hairy.

**Head:** black; with heavy reticulation, including the vertex; pale chestnut ocelli.

**Eyes:** medium-sized, black.

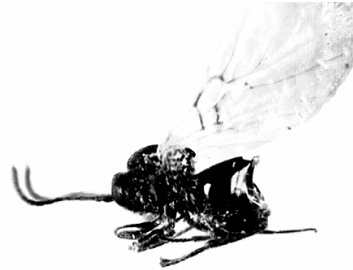
**Mouthparts:** - appendages; - mandibles.

**Thorax:** black, hunched; mesoscutum reticulated; full length notaulices; up to half-length median line; yellow tegulae; scutellum coarsely reticulated, with microsculpture between, edged with coarse reticulation; separated black foveae with faint signs of sculpture; mesopleuron with longitudinal striae reduced towards the bottom.

**Legs:** short, dark brown coxae; tapering to dirty brown-yellow.

**Wings:** clear; mid yellow-brown veins and inconspicuous yellow-brown hairs; radial cell open.

**Gaster:** dark brown with yellow lower edges; short, deep, glossy, hairless; no ploughshare.



♂ X 12

**Impression:** BLACK to VERY DARK BROWN HEAD & THORAX; BLACK GASTER; DARK TO DIRTY YELLOW-BROWN LEGS; TRANSLUCENT YELLOW OR PALE BROWN ANTENNAE. FOURTEEN antennal segments.

**Length:** Body 1.7mm (1.4-2.1)

**Ratios:** Wings/Body 167%

**Antennae:** translucent yellow, or very pale brown; scape mid neutral-brown, long pedicel; 3rd slightly curved and club-shaped; the rest like string of beads; grooved sensillae; not tapered; long & heavy.

**Head:** black; reticulated, including vertex; pale chestnut ocelli.

**Eyes:** black, large.

**Mouthparts:** mandibles dirty yellow with chestnut tips; dirty yellow appendages.

**Thorax:** black, hunched; mesoscutum all reticulated; full-length shallow, wide notaulices; short median line; yellow tegulae; scutellum reticulated with coarsely reticulated edges; separated black foveae with faint signs of sculpture; mesopleuron longitudinally striate all over.

**Legs:** coxae and rear femur dark; rest dirty pale yellow-brown.

**Wings:** clear; veins from yellow to darker brown; dark hairs; open radial cell.

**Gaster:** black, with a few white hairs; some segments show; glossy.





*Andricus kollari*

♂ X 48 - **Marble-gall causer**

*Impression:* YELLOW-BROWN HEAD, THORAX, LEGS & ANTENNAE; DARK YELLOW GASTER. THIRTEEN antennal segments.

*Length:* Body **5.1mm** (3.0-6.5)

*Ratios:* Wings/Body **117%**

*Antennae:* yellow-brown; slightly tapered; medium-long 3rd.

*Head:* yellow-brown, with darker vertex and round mouth; small; small dark brown ocelli.

*Eyes:* deep neutral brown, mid-sized.

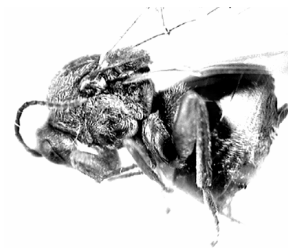
*Mouthparts:* dark mandibles and paler yellow-brown appendages.

*Thorax:* yellow-brown with black patches on sides; mesoscutum rugose, with fans of hairs lengthwise; full-length notaulices; shallow full-length median line; pale tegulae; small rugose scutellum; foveae separated, from near black to dark chestnut; mesopleuron lightly sculpted, very hairy.

*Legs:* yellow-brown, semi-translucent.

*Wings:* dark brown veins and hairs.

*Gaster:* more yellow than brown, segmented, swollen, deep; bands of hairs edging segments.



*Andricus legitimus*, Wiebes-Rijks 1980 - only agamic is known, though sexual may exist

**♂ - Stunted-acorn gall causer**

*Impression:* CHESTNUT & BLACK HEAD; DARK-STRIPED CHESTNUT THORAX; DARK LEGS & ANTENNAE. (taken from paper). FIFTEEN antennal segments.

*Length:* Body 4.5mm approx.

*Ratios:* Wings/Body .%

*Antennae:* dark except for reddish pedicel and scape.

*head:* reddish, with black round mouth and antennal sockets; temples dilated behind the eyes.

*eyes:*

*mouthparts:*

*thorax:* reddish with black; mesoscutum smooth and shiny with two longitudinal black patches; full-length notaulices; no median line, though sometimes a couple of faint pits show; weakly sculpted scutellum with sparse hairs; shiny red foveae.

*legs:* dark brown. to black coxae, trochanter and tarsi, rest reddish.

*wings:* dark brown veins and hairs; conspicuous projection in the radial cell of the 1st abscissa of the radius.

*gaster:* reddish; bulky, partly segmented; 1.5 x length of thorax; the first gastral tergite is 2.5 x as long as the next one and is hairy at the side; hypopygium with ventral spine 4.5 to 5 x as long as wide.



**Andricus lignicola** (Hartig 1840) - agamic & sexual generations

♀ X 32

**Impression:** BLACK HEAD & THORAX, BLACK/BROWN GASTER; TAPERED BROWN /YELLOW LEGS; DARK BROWN ANTENNAE. THIRTEEN antennal segments.

**Length:** Body 1.8mm (1.6-2.1)

**Ratios:** Wings/Body 154%

**Antennae:** mid-brown variable to much paler; dark brown scape, long mid-brown pedicel; 3rd segment straight, stout and clubbed; hairy flagellum.

**Head:** black; heavy reticulation, including vertex; ocelli mid-brown.

**Eyes:** black, mid-sized.

**Mouthparts:** dark brown appendages; very dark brown mandibles.

**Thorax:** black; mesoscutum reticulated, with longitudinal striae at rear (*look from side*); full length notaulices; faint trace of median line; tegulae glossy, neutral mid-brown; scutellum coarsely reticulated with row of very coarse reticulation at back; separated black foveae; mesopleuron with longitudinal striae, reduced towards bottom.

**Legs:** dark brown coxae & femora tapering to dirty yellow, but colour varies from darker to lighter.

**Wings:** clear; dark brown veins; short, dark hairs; radial cell open.

**Gaster:** black-brown with pale edges at back; segmented, glossy; almost square, with long ventral spine; no ploughshare; band of pale hairs at top and back of sides.



♂ X 18

**Impression:** BLACK BODY; TAPERED BROWN/DIRTY YELLOW LEGS; BROWN ANTENNAE; COLOURING MAY VARY IN INTENSITY. FOURTEEN antennal segments.

**Length:** Body 1.9mm (1.4-2.0)

**Ratios:** Wings/Body 161%

**Antennae:** mid-brown (variable); dark brown scape and brown longer pedicel; 3rd bent and swollen at top; grooved sensillae.

**Head:** black; heavy reticulation, including vertex; pale chestnut ocelli.

**Eyes:** black, large.

**Mouthparts:** very dark brown mandibles, dark brown appendages.

**Thorax:** black; mesoscutum reticulated, with longitudinal striae at rear (*look from side*); full-length notaulices; without, or only a faint median line; tegulae dark brown; scutellum with coarse reticulation & very coarse reticulation at side and back; smooth, separated foveae; mesopleuron longitudinally striate, reducing to none at bottom.

**Legs:** dark brown coxae & femora, paler joints; the rest dirty yellow.

**Wings:** clear; dark neutral brown veins; short, dark, coarse hairs which can be paler in some insects; radial cell open.

**Gaster:** black; with one main segment; small, glossy, pointed; a few large hairs at front.



*Andricus lignicola*

♂ X 58 - **Cola nut causer**

Impression: YELLOW-BROWN BODY, LEGS & ANTENNAE. THIRTEEN antennal segments.

Length: Body **4.7mm** (3.3-5.5)

Ratios: Wings/Body **114%**

Antennae: pale yellow-brown; normal 3rd; thin and long; slight taper at tip.

Head: small, yellow-brown, with a definite sheen; much pale pubescence; small pale ocelli.

Eyes: mid-brown, small.

Mouthparts: brown-yellow appendages; dark mandibles.

Thorax: brown-yellow, with mass of pale pubescence; mesoscutum with small granular sculpture and fans of pale hairs; full-length notaulices; short to no median line; dirty yellow tegulae; scutellum small & rugose; separated black foveae; yellow-brown mesopleuron with whorls of sculpture.

Legs: brown-yellow, semi-translucent; fringe of short hairs.

Wings: pale brown hairs and veins.

Gaster: brown-yellow, shiny & bulky; segmented, but one major segment; much pubescence towards rear and on sides.



**Andricus lucidus** (Hartig 1843) - agamic & sexual generations

♀ X 7

**Impression:** BLACK HEAD & THORAX; TRANSLUCENT DARK & CHESTNUT-GOLD GASTER; CHESTNUT-BUFF LEGS; GOLDEN ANTENNAE WITH DARK TIPS. THIRTEEN antennal segments.

**Length:** Body **2.8mm** (2.6-3.0)

**Ratios:** Wings/Body **119%**

**Antennae:** translucent gold blending into black for the last four segments; slight taper.

**Head:** black, granulated, hairy.

**Eyes:** dark, mid-sized.

**Mouthparts:** dark chestnut-brown mandibles; pale chestnut-yellow appendages.

**Thorax:** all black & hairy; granulated mesoscutum; full-length notaulices; very short or no median line; translucent chestnut-buff tegulae; scutellum rugose; mesopleuron rugose, covered in long white hairs; long propodeum.

**Legs:** all translucent chestnut-buff.

**Wings:** clear; dark main veins with pale yellow tinges and edges; pale hairs.

**Gaster:** smooth, segmented; dark base and top, blending into translucent golden-chestnut; very faint tiny punctures on 3<sup>rd</sup> segment; long, slender ventral spine with short, sparse hairs.



♂ x 71

**Impression:** BLACK HEAD & THORAX; TRANSLUCENT CHESTNUT GASTER; TRANSLUCENT GOLD LEGS & ANTENNAE. FOURTEEN antennal segments.

**Length:** Body **2.5mm**. (1.9-2.6)

**Ratios:** Wings/Body **125%**

**Antennae:** translucent gold-brown; fat flask-shaped scape, smaller short pedicel; 3<sup>rd</sup> expanded and bent at top; not tapered, indeed top few are thinner than middle.

**Head:** black, strongly sculpted and hairy; large, brown ocelli.

**Eyes:** mid-sized, dark.

**Mouthparts:** chestnut mandibles with dark tips.

**Thorax:** black, heavily sculpted; mesoscutum rugose-reticulate; glossy, full-length notaulices; very short or no median line; tegulae gold; scutellum heavily rugose; separated black foveae; mesopleuron heavily sculpted.

**Legs:** translucent gold, with dark claws.

**Wings:** clear, with very dark brown veins and inconspicuous dark hairs.

**Gaster:** translucent chestnut at front, lightening to gold at rear; one main segment, glossy without punctuations.



at rear; one



**Andricus lucidus**

♂ X 94 - **Hedgehog/Bristle gall causer**

**Impression:** BLACK HEAD & THORAX; DARK GASTER WITH CHESTNUT END; BROWN LEGS; DARK ANTENNAE. THIRTEEN antennal segments.

**Length:** Body 2.9mm (1.9-3.6)

**Ratios:** Wings/Body 132%

**Antennae:** mid-brown to dark; dark scape with pale base; pedicel long & clubbed; 3rd longish, straight & clubbed; hairy; strong taper.

**head:** black; rugose, including vertex; long, pale hair; ocelli dull neutral-brown; light striae from corner of mouth to bottom of eyes.

**eyes:** black, medium-small.

**mouthparts:** paler appendages; large chestnut mandibles with dark tips.

**thorax:** black, with long pale hairs; mesoscutum heavily rugose; slender full-length notaulices; no median line; tegulae pale translucent gold-brown; scutellum coarsely rugose, width 114% of length; wide, shallow but separated foveae with light rugose sculpture; mesopleuron dull, with heavily branched longitudinal striae, hairy.

**legs:** coxae part chestnut; rest dark dull brown with final couple of tarsal segments paler.

**wings:** clear; dark brown veins, inconspicuous mid-brown hairs; radial cell open.

**gaster:** dark & glossy with paler chestnut lights; segmented; segments all pale behind, giving a banded appearance; the final segments hairy, with light punctuation; ventral spine long, thin, with blunt tip and sparse hairs which are short at tip but long & coarse further back.



*Andricus nudus* Adler 1881 - agamic & sexual generations

♀ X 2 - **Bald-seed gall causer**

Impression: RICH DARK BROWN BODY; YELLOW LEGS & ANTENNAE. THIRTEEN antennal segments.

Length: Body **1.5mm**

Ratios: Wings/Body **145%**

Antennae: pale yellow, slender, slightly tapered; hairy; short segments with fat scape & pedicel.

Head: dark brown; comparatively unsculpted with some pale hairs.

Eyes: dark brown blending into head; quite large.

Mouthparts: yellow mandibles and pale appendages.

Thorax: rich dark brown; full-length notaulices; smooth except for heavily sculpted scutellum.

Legs: all yellow except for tapered brown at top of coxae.

Wings: pale brown veins, with very pale hairs.

Gaster: polished dark brown with sparse, pale hairs; one large segment but others strongly visible.

♂

Impression: ALL BLACK BODY. FIFTEEN antennal segments.

Length: Body mm.

Ratios: Wings/Body %.

Antennae: .

Head: BLACK

Eyes:

Mouthparts:

Thorax: BLACK; scutellum smooth & shiny in the middle.

Legs:

Wings:

Gaster: BLACK



*Andricus nudus*

♂ X 4 **Malpighi's gall causer**

*Impression:* BLACK HEAD; CHESTNUT-YELLOW & DARK THORAX; DARK & CHESTNUT-YELLOW GASTER; DIRTY PALE CHESTNUT LEGS; DARK YELLOW-CHESTNUT ANTENNAE. FOURTEEN antennal segments.

*Length:* Body **2.9mm** (2.7-3.0)

*Ratios:* Wings/Body **145%**

*Antennae:* deep yellow-chestnut; long, slender; tapered.

*Head:* black; small pale chestnut ocelli.

*Eyes:* medium-sized; dark brown.

*Mouthparts:* deep yellow mandibles & appendages.

*Thorax:* rich chestnut-yellow with dark patches; mesoscutum unsculpted, with some darker brown shading; full-length notaulices; broken 1/4 length median line; chestnut tegulae; black separated foveae; hairy scutellum with light leathery microsculpture; glossy mesopleuron.

*Legs:* dirty pale chestnut; darker at top; dark claws; hairy.

*Wings:* clear; rich brown veins & hairs; long thin radial cell.

*Gaster:* dark above, with rich yellow-chestnut below; yellow, segmented; unsculpted; deep from side view.





*Andricus quadrilineatus* Hartig 1840 - agamic generation only

♂ X 2 - **Furrowed-catkin gall causer**

*Impression:* ORANGE-BROWN HEAD; ORANGE & DARK-STRIPED THORAX; GOLDEN-CHESTNUT & DARK GASTER; ORANGE-BROWN LEGS & ANTENNAE. FOURTEEN antennal segments.

*Length:* Body **2.6mm**

*Ratios:* Wings/Body **147%**

*Antennae:* mid orange-brown; slightly tapered, fat scape.

*Head:* small, orange-brown, covered with fuzz; dark round mouth and on vertex; small chestnut ocelli.

*Eyes:* small; mid-brown neutral.

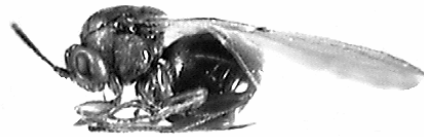
*Mouthparts:* chestnut mandibles, pale appendages.

*Thorax:* orange & dark; glossy unsculpted mesoscutum with three dark chestnut stripes on top and patches of dark chestnut on sides; full-length notaulices; 1/4 length median line; chestnut tegulae; lightly hairy rugose orange scutellum; separated black foveae; glossy, unsculpted mesopleuron.

*Legs:* tapering gently from dark femora to bright pale orange-brown.

*Wings:* dark veins and hairs.

*Gaster:* pale golden-chestnut below, darker at top and rear; very full from side; shining, segmented.



***Andricus quercuscalicis*** (Burgsdorf 1783) - agamic & sexual generations

♀ X 28

**Impression:** BLACK BODY; LARGELY GOLDEN LEGS; TRANSLUCENT GOLD ANTENNAE WITH DARK TIP. THIRTEEN antennal segments.

**Length:** Body 1.4mm (1.2-1.5)

**Ratios:** Wings/Body 153%

**Antennae:** all translucent gold except for darker 4 segments at tip; not tapered.

**Head:** black, heavily reticulated, including vertex; chestnut brown ocelli.

**Eyes:** dark brown; mid-sized.

**Mouthparts:** neutral mandibles; translucent gold appendages.

**Thorax:** black, hunched; mesoscutum reticulated, with longitudinal striae at rear – though sometimes sculpture is much reduced (*view from side*); full-length notaulices; short wide median line foveae separated and glossy; tegulae yellow-brown; scutellum very coarsely reticulated; mesopleuron longitudinally grooved, with lighter sculpture at bottom.

**Legs:** all translucent gold except for darker tip to coxae and for dark tarsi.

**Wings:** clear; yellow-brown hairs and veins; radial cell open.

**Gaster:** black, glossy, with faint yellow surround to ventral spine; no ploughshare; segmented; rounded & fat.



♂ X 34

**Impression:** BLACK BODY; GOLDEN-BROWN LEGS; TRANSLUCENT GOLD ANTENNAE WITH DARKER TIP. FOURTEEN antennal segments.

**Length:** Body 1.3mm (1.0-1.5)

**Ratios:** Wings/Body 160%

**Antennae:** clear translucent gold, with last 3/4 segments darker neutral brown; darker scape; 3rd segment clubbed and slightly bent, with swollen top; not tapered.

**Head:** black; heavily reticulated, including vertex; ocelli straw-coloured.

**Eyes:** black, mid-sized.

**Mouthparts:** dark neutral brown appendages & mandibles.

**Thorax:** black; mesoscutum reticulated, with longitudinal striae at rear (*view from side*); full-length notaulices; short, wide median line; tegulae dirty gold; scutellum with fine reticulation at very front, the rest coarsely reticulate; separated glossy foveae; mesopleuron longitudinally striate.

**Legs:** dark coxae, the rest dirty yellow.

**Wings:** yellow-brown hairs & veins; clear; radial cell open.

**Gaster:** black, semi-glossy; single main segment; small; pointed; hairless.



*Andricus quercuscalicis*

**♂ X 50 - Knopper gall causer**

*Impression:* BLACK & ORANGE HEAD & STRIPED THORAX; MAINLY BLACK GASTER; BLACK & ORANGE STRIPED LEGS; DARK ANTENNAE. FOURTEEN antennal segments.

*Length:* Body 4.8mm (4.5-5.4)

*Ratios:* Wings/Body 130%

*Antennae:* black, with pale hairs; long, swollen black scape with orange base, long thin pedicel; long straight 3rd with orange base; only slightly tapered.

*Head:* orange with black vertex and back, as well as round mouth; temples dilated behind eyes, masses of pale hairs; deep chestnut ocelli.

*Eyes:* small, neutral brown.

*Mouthparts:* shiny black mandibles with touches of orange at base; orange appendages.

*Thorax:* black & orange; mesoscutum striped black & orange, densely hairy, sparsely punctate & shiny; hairy and shiny; shallow, full-length notaulices; ultra-short median line; tegulae orange with dark back; black separated foveae; scutellum round, hairy with rugose sculpture, the top dark, fading into chestnut sides; mesopleuron orange, with black edges at back and below.

*Legs:* dark coxae fading to orange; distinctive longitudinally-striped femora, dark on top and orange below.

*Wings:* dark brown veins and hairs; translucent except for brown of veins bleeding around areolet; open radial cell.

*Gaster:* black with some orange at bottom of segments; bulky, segmented, shiny; long, slender hypopygium with short sparse hairs; masses of pale hairs in bands on edge of segments.



*Andricus quercuscorticis* (Linnaeus 1761) - agamic & sexual generations

♀ X 1 - **Bud gall causer**

Impression: THIRTEEN antennal segments.

Length: **Body 2.8mm**

Ratios: **Wings/Body 123%**.

Antennae: .

Head:

Eyes:

Mouthparts:

Thorax:

Legs:

Wings:

Gaster:

♂

Impression: FIFTEEN antennal segments.

Length: **Body mm.**

Ratios: **Wings/Body %.**

Antennae: .

Head:

Eyes: **Large.**

Mouthparts:

Thorax:

Legs:

Wings:

Gaster:



*Andricus quercuscorticis*

♂ X 5 - **Bark gall causer**

*Impression:* DARK BROWN HEAD; BROWN THORAX WITH BLACK; BRIGHT CHESTNUT GASTER; LIGHT CHESTNUT LEGS; PALER & DARK ANTENNAE. FOURTEEN antennal segments.

*Length:* Body **3.7mm**

*Ratios:* Wings/Body **117%**

*Antennae:* pale chestnut ends, dark brown middle segments; fat scape; small pedicel; 3rd long & straight; the rest longer than wide; tapering.

*Head:* dark brown, darker round mouth; many pale hairs, faint coriaceous sculpture; bright dark ocelli.

*Eyes:* mid-sized; dark.

*Mouthparts:* beige-brown appendages, darker mandibles.

*Thorax:* hunched, dark brown & black; lightly granulated mesoscutum with lines of hairs running lengthways; full-length notaulices; 1/4 length median line from front; brown tegulae; separated sculpted foveae; scutellum lightly granulated with long pubescence; glossy, dark, lightly sculpted mesopleuron.

*Legs:* light chestnut with some dark neutral shading.

*Wings:* dark veins and hairs.

*Gaster:* bright chestnut, some specimens with near black first segment, segmented; semi-translucent; smooth, glossy; short blunt ventral spine.



*Andricus quercusradicis* (Fabricius 1798) - agamic & sexual generations

♀ X 2 - **Knot gall causer**

*Impression:* YELLOW HEAD WITH CONTRASTING DARK EYES; STRIPED YELLOW/BLACK THORAX & TESTACEOUS/CHESTNUT GASTER; YELLOW LEGS & ANTENNAE. THIRTEEN antennal segments.

*Length:* Body **3.0mm**

*Ratios:* Wings/Body **131%**

*Antennae:* colour tapering from pale yellow to darker; the whole slightly tapered.

*Head:* rich yellow, with some darker beneath; chestnut-red ocelli.

*Eyes:* small, dark brown, contrasting with head.

*Mouthparts:* pale yellow appendages & mandibles.

*Thorax:* black & yellow; mesoscutum yellow, with hairy black patch at front and black shoulder-stripes; full-length notaulices; no median line; dark & chestnut tegulae; hairy sculpted black scutellum; mesopleuron horizontally striate.

*Legs:* testaceous, translucent; not obvious light hairs.

*Wings:* mid neutral-brown veins and pale hairs; hyaline.

*Gaster:* testaceous, light translucent chestnut; bulky; segmented, semi-glossy.

♂ X 3

*Impression:* DARK BROWN BODY; YELLOW LEGS & ANTENNAE. FIFTEEN antennal segments.

*Length:* Body **2.5mm** (2.3-2.6)

*Ratios:* Wings/Body **159%**

*Antennae:* first three segments yellow, the rest darker with clear sensillae; 3rd slightly curved and flattened.

*Head:* dark brown; lightly sculpted; hairy round mouth and beneath.

*Eyes:* very dark and large.

*Mouthparts:* dark chestnut mandibles; pale yellow appendages.

*Thorax:* dark brown; mesoscutum glossy with light cross-sculpture; weak full-length notaulices; no median line; hairy, rough scutellum; top half of mesopleuron glossy, lower part with longitudinal striae.

*Legs:* yellow, with brown coxae and dark claws; hairy.

*Wings:* dark yellow veins & hairs; hyaline

*Gaster:* dark brown, segmented, glossy, hairless; deep but pointed.



*Andricus quercusradicis*

**8 X 9 - Truffle gall causer**

*Impression:* RED-BROWN HEAD & ANTENNAE; BLACK-STRIPED RED-BROWN THORAX; ORANGE GASTER & LEGS. FOURTEEN antennal segments.

*Length:* Body **3.8mm** (3.1-4.4)

*Ratios:* Wings/Body **131%**

*Antennae:* mid red-brown; slightly tapered.

*Head:* small, mid red-brown, covered with fuzz; pale chestnut ocelli.

*Eyes:* small; mid-brown neutral.

*Mouthparts:* dark chestnut mandibles, pale yellow appendages.

*Thorax:* mid red-brown, hairy with patches of black on sides; hairy mesoscutum with three black stripes; narrow full-length notaulices; short wide median line, not fully impressed; pale chestnut tegulae; black-rimmed, separated chestnut foveae; hairy chestnut scutellum with unobtrusive microsculpture; mesopleuron brown and lightly sculpted..

*Legs:* all bright pale orange-brown.

*Wings:* dark veins and hairs.

*Gaster:* pale orange-brown; very full from side; shining, segmented.



***Andricus quercusramuli*** (Linnaeus 1761) - agamic & sexual generations

♀ X 24 - **Cotton-wool gall causer**

*Impression:* PALE TO DARKER ORANGE-YELLOW AND BROWN HEAD, THORAX & GASTER., WITH LOWER HALF PALE TRANSLUCENT; YELLOW LEGS & ANTENNAE. THIRTEEN antennal segments.

*Length:* Body 1.7mm (1.4-2.8)

*Ratios:* Wings/Body 135%

*Antennae:* orange-yellow; long, with shortish segments; 3rd long & fat.

*Head:* from translucent orange-yellow to yellow-marked brown; smooth; yellow ocelli.

*Eyes:* medium-small, dark; contrasting with head.

*Mouthparts:* appendages & mandibles orange-yellow.

*Thorax:* orange-yellow to brown; segmented but smooth, with dull sheen; mesoscutum smooth, semi-glossy, with central darker panel, faint microsculpture; full-length notaulices; faint trace of short median line; translucent pale yellow tegulae; granular scutellum; glossy pale foveae outlined with dark brown; mesopleuron smooth & semi-glossy with obvious darker, contrasting, carina on front edge.

*Legs:* pale yellow to orange-yellow, with short, unobtrusive hairs.

*Wings:* mid-chestnut veins and hairs.

*Gaster:* shining, pointed; rich dark chestnut, with lower half pale translucent chestnut, varying in extent; single main segment; ventral spine long, hairs do not really protrude beyond tip.



♂ X 69

*Impression:* HEAD & THORAX ORANGE-YELLOW; DARK CHESTNUT GASTER; TRANSLUCENT YELLOW LEGS & ANTENNAE (May be confused with similar *Biorhiza pallida*). FIFTEEN antennal segments.

*Length:* Body 2.1mm (1.6-2.4)

*Ratios:* Wings/Body 130%

*Antennae:* all orange-yellow; 3rd fat & banana-shaped; not tapered.

*Head:* small; translucent orange-yellow; smooth & shining; ruby ocelli.

*Eyes:* small, dark brown, in strong contrast to rest of head.

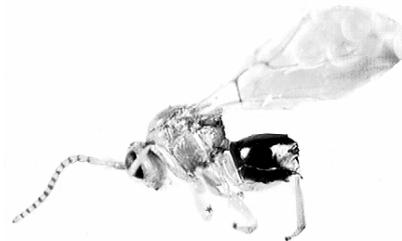
*Mouthparts:* mandibles and appendages orange-yellow.

*Thorax:* orange-yellow with more or less red-brown markings in panels; mesoscutum semi-glossy with very faint microsculpture; full-length notaulices; short & faint median line; translucent pale chestnut tegulae; scutellum granular; foveae separated by brown line; mesopleuron smooth & semi-glossy with obvious, contrasting, darker carina on front edge.

*Legs:* orange-yellow, with dark claws.

*Wings:* clear, with golden veins and hairs.

*Gaster:* semi-glossy dark chestnut, sometimes with traces of translucent pale chestnut below; one main segment.





*oak-galls - volume two*

*descriptions/causers*

*Andricus quercusramuli*

**♂ - The Autumn gall causer**

Impression:

Length: **Body** mm.

Ratios: **Wings/Body** %.

Antennae:

Head:

Eyes:

Mouthparts:

Thorax:

Legs:

Wings:

Gaster:



*Andricus rhizomae* (Hartig 1843) - agamic generation only

♂ X 1

*Impression:* HUNCHED & BULKY; MOSTLY DIRTY CHESTNUT HEAD; DARK THORAX; CHESTNUT GASTER; DARK ANTENNAE; MAINLY DARK LEGS; FOURTEEN antennal segments.

*Length:* Body 4.1mm

*Ratios:* Wings/Body 139%.

*Antennae:* dark, with faint chestnut at base of scape & pedicel; third & fourth segments around the same length; tapered.

*Head:* dirty chestnut; black behind vertex on the occiput and around the edge of the mouth; pubescent.

*Eyes:* small; dark.

*Mouthparts:* dark brown mandibles; mid neutral-brown appendages.

*Thorax:* mesoscutum largely dark with some faint longitudinal chestnut markings, scattered large punctuations, alutaceous, long pubescence in longitudinal lines, shiny; full-length notaulices; median line just over half-length from back; dark brown tegulae; closely punctate dark scutellum with long pubescence; shiny separated foveae; black propodeum; mesopleuron largely smooth with patch of punctuations at back; partly pubescent round edges.

*Legs:* dark chestnut coxae; chestnut femora with conspicuous dark upper edge; dark tibiae & tarsi.

*Wings:* clear; dark rich brown veins with slight bleed into clear area below radial cell.

*Gaster:* all chestnut; segmented; smooth; heavily pubescent below and at rear; long slender largely hairless ventral spine.



**Andricus seminationis** (Giraud 1859) - agamic generation only

**♂ X 6 - Spindle-gall causer**

**Impression:** HUNCHED; GOLD HEAD; TRANSLUCENT RED-GOLD THORAX; TESTACEOUS GASTER; GOLD-BROWN LEGS; BROWN ANTENNAE. FOURTEEN antennal segments.

**Length:** Body **3.0mm**

**Ratios:** Wings/Body **139%**

**Antennae:** mid brown, with red tint; slightly tapered, with long segments.

**Head:** translucent gold; dark round mouth edge; small; smooth with faint coriaceous microsculpture; inconspicuously hairy; large dark ocelli.

**Eyes:** black, contrasting with head; medium-sized; bulging.

**Mouthparts:** testaceous mandibles and appendages.

**Thorax:** translucent pale chestnut; mesoscutum smooth with faint coriaceous microsculpture and four longitudinal darker panels; full-length dark notaulices; 1/4 length median line; pale chestnut tegulae; dark separate foveae; smooth scutellum with faint coriaceous microsculpture; smooth mesopleuron.

**Legs:** mid gold-brown with dark claws; hairy.

**Wings:** Translucent; mid-brown main veins, with conspicuous gap before radial cell..

**Gaster:** translucent testaceous; large, smooth & bulky; deep & triangular; long slender ventral spine.



**Andricus solitarius** (Fonscolombe 1832) - agamic & sexual generations

♀ X 4

**Impression:** HUNCHED; DARK BROWN HEAD & THORAX; CHESTNUT GASTER; YELLOW LEGS & ANTENNAE. THIRTEEN antennal segments.

**Length:** Body **2.8mm** (1.9-3.2)

**Ratios:** Wings/Body **131%**

**Antennae:** yellow darkening slightly towards the tip; 3rd straight and longer than rest; slightly tapered; pale sensillae & hairs.

**Head:** very dark brown/black, granular, slight gloss.

**Eyes:** very dark brown, mid-sized.

**Mouthparts:** pale appendages; dark-pointed yellow mandibles.

**Thorax:** very dark brown; mesoscutum semi-glossy, with sculpture; full-length notaulices; no median line; glossy reticulated scutellum, with coarse hairs; deep, clear foveae; glossy mesopleuron with some longitudinal sculpture.

**Legs:** translucent deep yellow, lightly hairy.

**Wings:** clear; pale brown hairs and veins.

**Gaster:** deep translucent chestnut; not segmented, glossy; deep and bulky; few hairs on edge of front segment; long, thin ovipositor sheath with tuft of hairs at tip

♂ X 2

**Impression:** HUNCHED; BLACK HEAD & THORAX; VERY DARK BROWN GASTER; DARK YELLOW LEGS; BROWN ANTENNAE. FIFTEEN antennal segments.

**Length:** Body **3.3mm**

**Ratios:** Wings/Body **146%**

**Antennae:** dark yellow, darkening towards the tip; fat scape but normal pedicel; 3rd bent & expanded at top; not tapered.

**Head:** black & granular; rugulose vertex.

**Eyes:** very dark brown/black; mid-sized.

**Mouthparts:** pale appendages, dark mandibles.

**Thorax:** black; mesoscutum granular, semi-glossy; full-length notaulices; no median line; scutellum heavily sculpted, with hairs; mesopleuron glossy but front half with longitudinal sculpture.

**Legs:** deep yellow, with darker coxae; hairy.

**Wings:** clear; pale yellow veins and hairs.

**Gaster:** chestnut, high gloss; not segmented; unsculpted, pointed.



*Andricus solitarius*

♂ X 1 - **Hairy-spindle gall causer**

Impression: YELLOW-BROWN HEAD, GASTER, LEGS & ANTENNAE; DARK THORAX; FOURTEEN antennal segments.

Length: Body 3.0mm

Ratios: Wings/Body ?%

Antennae: all yellow-brown; not tapered.

Head: yellow-brown; granulate; pubescent; dirty-yellow ocelli.

Eyes: yellow-brown; mid-sized.

Mouthparts:

Thorax: dark & chestnut; lightly granulate, chestnut mesoscutum with largely dark top, some pubescence; narrow full-length notaulices; no median line; separated black foveae; scutellum distinctly rugose, yellow-brown; mesopleuron.

Legs: dirty yellow-brown.

Wings: clear.

Gaster: yellow-brown, paler beneath; smooth; segmented.



***Andricus testaceipes*** Hartig 1840 - agamic & sexual generations

♀ X 3 - **Leaf-vein gall causer**

**Impression:** HUNCHED; BLACK HEAD & THORAX; CHESTNUT GASTER, LEGS AND ANTENNAE; LARGE PLOUGHSHARE. THIRTEEN antennal segments.

**Length:** Body 1.5mm (1.5-1.6)

**Ratios:** Wings/Body 149%

**Antennae:** chestnut-brown darkening towards tip; long, yellow scape, fat yellow scape; straight 3rd segment; tapered gradually to club; hairy.

**Head:** black, with leathery sculpture, hairy.

**Eyes:** mid-sized, dark.

**Mouthparts:** pale appendages; dark-tipped, pale chestnut mandibles.

**Thorax:** black; mesoscutum semi-glossy with small cross-rugae, sparsely hairy; full-length notaulices; no median line; testaceous tegulae; scutellum heavily sculpted and hairy; mesopleuron glossy, with a few longitudinal striae.

**Legs:** deep yellow-chestnut, hairy.

**Wings:** translucent, dark hairs and pale veins.

**Gaster:** translucent chestnut with paler, large ploughshare beneath; segmented, smooth, glossy; sparsely hairy at front; long, thin ovipositor sheath.

♂

**Impression:** ALL REDDISH-YELLOW, WITH YELLOW LEGS & ANTENNAE. FIFTEEN antennal segments.

**Length:** Body mm

**Ratios:** Wings/Body %

**Antennae:** yellow.

**Head:** reddish-yellow.

**Eyes:**

**Mouthparts:**

**Thorax:** reddish-yellow.

**Legs:** yellow

**Wings:**

**Gaster:** reddish-yellow.



*Andricus testaceipes*

**♂ X 7 - Red-barnacle gall causer**

**Impression:** ORANGE-BROWN HEAD & LEGS; CHESTNUT & DARK THORAX; ORANGE-BROWN & CHESTNUT GASTER; TESTACEOUS ANTENNAE. FOURTEEN antennal segments.

**Length:** Body **4.0mm** (3.4-4.5)

**Ratios:** Wings/Body **124%**

**Antennae:** testaceous, darkening at last few segments; long 3rd; long, thin & slightly tapering.

**Head:** small, orange-brown; small dark ocelli.

**Eyes:** small, dark brown.

**Mouthparts:** mandibles and appendages testaceous.

**Thorax:** chestnut; steeply hunched; mesoscutum lightly sculpted and hairy with dark longitudinal patches; full-length notaulices; faint median line; chestnut tegulae; separate black foveae; scutellum rugose with longitudinal; lines of hairs; mesopleuron unsculpted, glossy and hairy.

**Legs:** orange-brown.

**Wings:** mid-brown veins and hairs.

**Gaster:** orange-brown tapering to translucent chestnut for final third; shiny; segmented.



*oak-falls - volume two*

*descriptions/causers*

# **Aphelonyx, - some common factors**

STEEPLY HUNCHED

SEGMENTED GASTER

PLOUGHSHARE BENEATH GASTER





*Aphelonyx cerricola* Giraud 1859 - agamic generation only

♂ X 48

**Impression:** BRIGHT ORANGE-CHESTNUT HEAD & THORAX; CHESTNUT & DARK GASTER; PALE CHESTNUT LEGS; DARK ANTENNAE. FOURTEEN antennal segments.

**Length:** Body 5.5mm (3.9-6.0)

**Ratios:** Wings/Body 126%

**Antennae:** the first 6 funicular segments dark brown, the rest mid-brown; fat brown scape with black base, round brown pedicel; the first 4 funicular segments with trumpet-shaped ends.

**Head:** small, orange-chestnut; rugose with dense hair covering the sculpture..

**Eyes:** small, elongate & black.

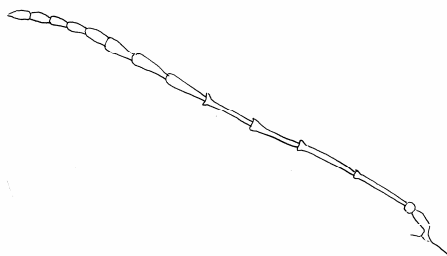
**Mouthparts:** black-tipped brown mandibles, translucent brown appendages.

**Thorax:** orange-chestnut; mesoscutum with mass of small rugae covered in pale hairs; full-length notaulices; no median line; testaceous-brown tegulae; scutellum round, hairy and sculpted; no foveae; mesopleuron hairy, hiding rugose sculpture.

**Legs:** translucent chestnut; hairy, with densely hairy coxae.

**Wings:** clear; dark & chestnut veins, chestnut tinted hairs.

**Gaster:** bright chestnut with dark bands following the segmentation; bands of pale hair; mass of pale hairs on sides, smooth above; black stubby final segment.



# **Biorhiza, Westwood 1840**

## **- some common factors**

SHORT PRONOTUM

RADIAL CELL OPEN

MESOPLEURON WITHOUT LONGITUDINAL FURROWS

TARSAL CLAWS WITHOUT BASAL LOBE

FEMALES - VENTRAL SPINE SHORT, WITH SUB-APICAL HAIRS PROTRUDING BEYOND TIP, IN BROAD TUFT

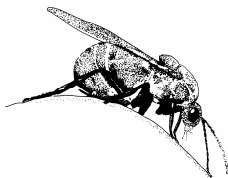
SEXUAL - WINGED

AGAMIC - WINGLESS

SUB-OCULAR CARINAE PRESENT (VERY DIFFICULT TO SEE, ESPECIALLY IN PALE SPECIMENS)

WINGLESS FEMALES WITH FLATTENED THORAX

MALES - WINGED



***Biorhiza pallida*** (Olivier 1791) - agamic & sexual generations

♀ X 64 - **Oak-apple causer**

Impression: **GOLDEN TO BROWN BODY, LEGS & ANTENNAE** (may be confused with similar but smaller *Andricus quercusramuli*). **FOURTEEN** antennal segments.

Length: **Body 3.0mm** (2.1-3.4)

Ratios: **Wings/Body 104%**

Antennae: **golden-brown; not tapered; straight third segment; long, slender; hairy; short.**

Head: **translucent, from dark brown to paler translucent gold-brown, pale hairs; ocelli chestnut.**

Eyes: **dark brown, prominent & quite large.**

Mouthparts: **red-gold appendages; chestnut-tipped mandibles.**

Thorax: **semi-translucent yellow-chestnut with darker panelling; mesoscutum smooth & shining; full-length notaulices; no median line; tegulae testaceous; scutellum clearly sculpted; foveae separated, dull and shallow; mesopleuron semi-glossy.**

Legs: **translucent chestnut-gold, hairy.**

Wings: **clear; gold to dark-brown veins and pale brown short hairs.**

Gaster: **golden-brown to dark chestnut, swollen & smooth; not obviously segmented; ventral spine short, with hairs protruding beyond tip; ovipositor sheath does not protrude.**



♂ X 24

Impression: **CHESTNUT-YELLOW HEAD & THORAX; CHESTNUT GASTER; YELLOW-BROWN LEGS & ANTENNAE** (may be confused with similar but smaller *Andricus quercusramuli*). **FIFTEEN** antennal segments.

Length: **Body 2.9mm** (2.1-3.5)

Ratios: **Wings/Body 123%**

Antennae: **from mid-brown to paler chestnut-yellow; not tapered; short third segment; sharply curved.**

Head: **dark chestnut-yellow, lightly granulated; ocelli chestnut.**

Eyes: **large, pale.**

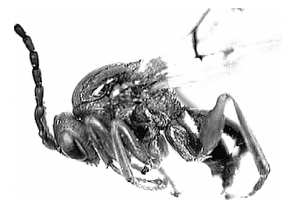
Mouthparts: **translucent pale appendages; chestnut-tipped mandibles.**

Thorax: **semi-translucent yellow-chestnut with darker panelling; mesoscutum smooth & shining; full-length notaulices; no median line; tegulae testaceous; scutellum clearly sculpted & broad; dull and shallow separated foveae; mesopleuron semi-glossy.**

Legs: **all translucent pale chestnut- yellow, hairy.**

Wings: **clear; prominent dark chestnut veins and hairs.**

Gaster: **shiny chestnut-yellow to rich chestnut; narrow, deep, triangular.**



*Biorhiza pallida*

**♂ X 3 - Root gall causer**

Impression: WINGLESS; YELLOW-BROWN TO ORANGE BODY & LEGS; MID-BROWN & ORANGE ANTENNAE. FIFTEEN antennal segments.

Length: Body **5.3mm** (4.8-6.3)

Ratios: Wings/Body **0%**

Antennae: bright mid-brown with orange tint; short 3rd; thin & slightly tapered.

Head: small, yellow-brown; slight sculpture; small pale orange ocelli.

Eyes: long, medium-sized; mid brown-yellow.

Mouthparts: yellow-brown appendages and mandibles.

Thorax: yellow-brown to orange; mesoscutum segmented but smooth; faint full-length notaulices; no median line; no foveae; scutellum smooth and virtually undifferentiated; mesopleuron smooth.

Legs: all yellow-brown.

Wings: not present.

Gaster: yellow-brown; large and fat; shining and segmented.



*oak-galls - volume two*

*descriptions/causers*

## **Callirhytis, Foerster 1869**

**- some common factors**

SHORT PRONOTUM

RADIAL CELL OPEN

FACE COVERED WITH STRIAE, FANNING OUT FROM CLYPEUS



*Callirhytis bella* (Dettmer 1930) - sexual generation only

♀ X 5

**Impression:** ALL BROWN TO BROWN & ORANGE HEAD; BLACK OR BROWN THORAX & CHESTNUT GASTER; GOLDEN-BROWN LEGS & ANTENNAE. FOURTEEN antennal segments.

**Length:** Body 1.9mm (1.1-2.3).

**Ratios:** Wings/Body 120%.

**Antennae:** golden-brown.

**Head:** brown with or without orange around mouth and outside the eyes; pale ocelli.

**Eyes:** medium large, neutral.

**Mouthparts:** all golden brown..

**Thorax:** from more or less uniform neutral brown to black top with golden-brown patches on sides which merge in; mesoscutum with transverse striae, largely hairless;  $\frac{3}{4}$  length notaulices; no median line; tegulae translucent gold; scutellum with heavy rugulose sculpture; separate foveae; mesopleuron dark, glossy with light transverse striae.

**Legs:** translucent golden-brown, any hairs inconspicuous..

**Wings:** transparent, pale translucent gold veins and short, pale hairs; cell rs2 open.

**Gaster:** translucent chestnut with dark bands on edges; segmented; hairless; short; pointed, hairless ventral spine.



♂ X 2

**Impression:** BLACK HEAD & THORAX; DARK BROWN GASTER; CHESTNUT-YELLOW LEGS & ANTENNAE. FIFTEEN antennal segments.

**Length:** Body 1.6mm.

**Ratios:** Wings/Body 126%.

**Antennae:** chestnut-yellow with slightly darker scape; third segment expanded at top; short hairs; slight taper.

**Head:** black; granulated; masses of pale hairs; pale chestnut ocelli.

**Eyes:** Large; pale.

**Mouthparts:** pale neutral brown mandibles & appendages.

**Thorax:** black; mesoscutum leathery, largely hairless; full-length notaulices; quarter-length median line; chestnut tegulae; separate & heavily sculpted foveae; heavily sculpted leathery scutellum; shiny mesopleuron, hairless with longitudinal striae.

**Legs:** dark brown coxae; dark tinted femora; tibiae & tarsi chestnut-yellow; dark claws.

**Wings:** Clear; pale yellow-chestnut veins; dense dark hairs.

**Gaster:** dark brown with translucent pale below; glossy; single main segment; sparse upright pale hairs round front.



***Callirhytis erythrocephala*** (Giraud 1859) – sexual & agamic generations

♀ X 4

**Impression:** YELLOW-BROWN HEAD; CHESTNUT-BROWN THORAX; GLOSSY PALE CHESTNUT GASTER; PALE LEGS & ANTENNAE. FOURTEEN antennal segments.

**Length:** Body **1.9mm** (1.6-2.4)

**Ratios:** Wings/Body **120%**

**Antennae:** translucent beige; spherical pedicel; short, fat scape; straight 3<sup>rd</sup> segment; tapered.

**Head:** bright yellow-brown with chestnut frons merging in; granulated sculpture but highly glossy; appearing hairless.

**Eyes:** mid-sized, neutral.

**Mouthparts:** pale yellow appendages & chestnut mandibles.

**Thorax:** rich chestnut, glossy & granulated; mesoscutum with transverse striae and no obvious hairs; very short notaulices; no median line; tegulae pale; scutellum lightly rugose; no foveae; mesopleuron with upper part glossy and rest heavily granulated.

**Legs:** pale chestnut coxae, the remainder very pale and translucent.

**Wings:** clear; pale veins and very pale small hairs.

**Gaster:** pale chestnut; glossy and segmented; translucent.

♂ X 1

**Impression:** BLACK HEAD & THORAX; CHESTNUT GASTER; TRANSLUCENT PALE LEGS; MID-BROWN ANTENNAE. SIXTEEN antennal segments.

**Length:** Body **1.7mm**

**Ratios:** Wings/Body **135%**

**Antennae:** 16 segments; constant pale translucent yellow-brown; pale scape & large, fat pedicel; distinctive lobed segments (*see picture*); not tapered.

**head:** black, with inconspicuous pale hairs; lightly sculpted; conspicuous pale gold ocelli.

**eyes:** large & neutral.

**mouthparts:** pale beige appendages.

**thorax:** black; mesoscutum with heavy transverse striae; very short notaulices; no median line; tegulae mid dirty brown; scutellum heavily sculpted; mesopleuron glossy with some striae in the middle;

**legs:** all dirty golden-brown, translucent.

**wings:** clear; short, dark hairs; golden-brown translucent veins.

**gaster:** dark golden-brown to chestnut, translucent, unsculpted; segmented.



*Callirhytis erythrocephala*

8 X 8

**Impression:** HEAD ORANGE-BROWN; THORAX BLACK; GASTER BROWN; GOLD LEGS, BLACK & GOLD-BROWN ANTENNAE. FIFTEEN antennal segments.

**Length:** Body **2.9mm** (2.8-3.2)

**Ratios:** Wings/Body **121%**

**Antennae:** translucent gold-brown; last 10 segments from dark to black; long pedicel & fat scape.

**Head:** dirty orange, rugose; reticulated brown vertex; long radiating striae from clypeus to corner of eyes; pale orange-yellow ocelli.

**Eyes:** medium-large; dark neutral brown, with paler orange edges, contrasting with head colour.

**Mouthparts:** pale gold appendages; dark-brown, heavy mandibles.

**Thorax:** black, mesoscutum with curved, transverse, heavy striae;  $\frac{3}{4}$  length notaulices; no median line; translucent gold tegulae with darker centre; glossy sculpted and separated foveae; reticulate/rugose scutellum; mesopleuron longitudinally striate, semi-glossy.

**Legs:** rich gold, with darker coxae.

**Wings:** dark veins, with very pale, short hairs.

**Gaster:** dark brown, with translucent paler edges; segmented with jagged edges at back, though one larger than rest; semi-glossy; short hypopygium.





**Cynips, Linnaeus 1758**  
**- some common factors**

SHORT PRONOTUM

RADIAL CELL OPEN

FACE HAVING AT MOST A FEW RADIATING STRIAE

PROPODEUM WITH 2 LONGITUDINAL CARINAE ENCLOSING 'DIFFERENT' AREA

FEMALES - VENTRAL SPINE SHORT, HAIRS PROJECT IN WIDE TUFT

SEXUAL - NOT PUBESCENT

AGAMIC - PUBESCENT

MALES - CLAW WITH BASAL LOBE

SCUTELLAR FOVEAE JOINED TO FORM SHALLOW DEPRESSION

SEMI-CIRCULAR CARINA AT FRONT OF SCUTELLUM



*Cynips agama* Hartig 1840 - agamic generation only

♂ X 2 - **Yellow-pea gall causer**

Impression: CHESTNUT BODY & LEGS, DARK BROWN ANTENNAE. THIRTEEN antennal segments.

Length: **Body: 3.0mm**

Ratios: **Wings/Body 154%**

Antennae: dark brown; long pedicel, fat scape; long thin, straight 3rd segment; hairy.

Head: translucent pale chestnut, hairy with much small reticulation; small chestnut ocelli.

Eyes: mid-size, dark.

Mouthparts: dark appendages, very dark hairy mandibles.

Thorax: light chestnut; mesoscutum glossy, with faint transverse sculpture in middle, hairy in parts; black semicircular carina between this and scutellum; strong full-length notaulices; no median line; scutellum small, rounded, with bumpy surface and hairs; mesopleuron glossy, unsculpted and hairy.

Legs: dark coxae tapering to chestnut; very hairy.

Wings: clear; pale hairs and darker neutral brown veins.

Gaster: translucent chestnut, deeply segmented, smooth and glossy with hairs at front and beneath.



***Cynips disticha*** Hartig 1840 - agamic & sexual generations

♀ X 1

Impression: **BLACK HEAD & THORAX; DARK BROWN GASTER; YELLOW LEGS; YELLOW-GREY ANTENNAE. FOURTEEN** antennal segments.

Length: **Body 2.9mm**

Ratios: **Wings/Body 121%**

Antennae: **dirty yellow** at base, becoming grey-yellow; long 3rd and 4th segments, not tapered; hairy.

Head: **black**; lightly sculpted.

Eyes: **medium-sized, very dark.**

Mouthparts: **pale** appendages & mandibles.

Thorax: **black**; smooth and glossy mesoscutum; full-length notaulices; sculpted scutellum.

Legs: **tapering** from translucent gold to darker towards top; hairy.

Wings: **clear**; medium-brown veins and paler hairs.

Gaster: **dark-brown, glossy**; half one big segment, with obvious segments in rear half, with pointed edges; triangular and deep but smallish.

♂ X 1

Impression: **BLACK HEAD & THORAX; DARK BROWN GASTER; BROWN & YELLOW LEGS; DARK ANTENNAE; PETIOLATE. FIFTEEN** antennal segments.

Length: **Body 2.7mm**

Ratios: **Wings/Body 145%**

Antennae: **darker than above**; lightly sculpted, hairy.

head: **black**

eyes: **sizable, very dark.**

mouthparts: **pale** appendages & mandibles.

thorax: **glossy black**; glossy clear mesoscutum; full-length notaulices; heavily sculpted hairy scutellum.

legs: **glossy brown** coxae tapering to yellow-brown tibiae; hairy.

wings: **clear**; pale brown veins and hairs.

gaster: **semi-translucent dark brown** with short petiole; one large segment, the rest show strongly at rear, with sharp pointed edges; glossy, smooth, long and slender, with square end.



*Cynips disticha*

**8 X 5 - 2-cell gall causer**

*Impression:* HEAD & THORAX CHESTNUT & BLACK; RED-GOLD LEGS; DARK ANTENNAE. THIRTEEN antennal segments.

*Length:* Body **3.3mm** (2.9-3.5)

*Ratios:* Wings/Body **144%**

*Antennae:* dark & hairy; long segments, not tapered.

*Head:* chestnut, with dark stripe over front; long hairs; small dark brown ocelli.

*Eyes:* medium-sized; dark brown and conspicuous.

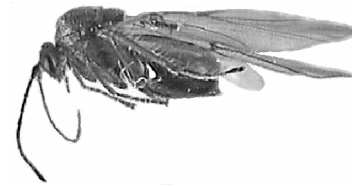
*Mouthparts:* chestnut mandibles with neutral, pale appendages.

*Thorax:* chestnut & black, semi-glossy, with little sculpture; smooth hairy mesoscutum with longitudinal black stripes; full length notaulices; no median line; hairy, lightly sculpted scutellum; no foveae; very lightly sculpted mesopleuron.

*Legs:* translucent red-gold; smooth & hairy.

*Wings:* clear; mid-brown veins and hairs.

*Gaster:* translucent chestnut with darker patches; smooth, glossy with hairs on line on join beneath.



***Cynips divisa*** Hartig 1840 - agamic & sexual generations

♀ X 2 - **Red-wart gall causer**

Impression: **DARK BROWN HEAD & GASTER; BLACK THORAX; YELLOW LEGS; PALE & DARK ANTENNAE. FOURTEEN** antennal segments.

Length: **Body 2.7mm**

Ratios: **Wings/Body 140%**

Antennae: **going from pale to dark brown at tip; tapering, long.**

Head: **dark brown; small; largely smooth; brown ocelli.**

Eyes: **mid-sized, dark brown.**

Mouthparts:

Thorax: **black; smooth mesoscutum; full-length notaulices; no median line; lightly granulated, hairy scutellum; no foveae; glossy mesopleuron.**

Legs: **bright yellow.**

Wings: **clear; long; dark veins and hairs**

Gaster: **dark brown tapering to pale tip; not segmented; slightly hairy and dull;.**

♂ X 1

Impression: **DARK BROWN HEAD & GASTER; DARK NEUTRAL-BROWN THORAX; DEEP YELLOW LEGS; BROWN ANTENNAE. FIFTEEN** antennal segments.

Length: **Body 2.2mm**

Ratios: **Wings/Body 158%**

Antennae: **brown; 3rd slightly bent; long & not tapered.**

head: **very dark brown & wide.**

eyes: **mid-sized, dark brown.**

mouthparts:

thorax: **dark neutral brown; dull, smooth but some light sculpturing; complete notaulices; no median line.**

legs: **deep yellow.**

wings: **clear; conspicuous dark yellow-brown veins and hairs; longish.**

gaster: **dark brown; short, square from side; segmented.**



*Cynips divisa*

♂ X 29 - **Red-pea gall causer**

*Impression:* VARIES FROM BRIGHT ORANGE-BROWN TO ALL DARK CHESTNUT BODY; BLACK BENEATH THORAX; DARK CHESTNUT LEGS; DARK ANTENNAE. THIRTEEN antennal segments.

*Length:* Body **3.4mm** (2.2-4.0)

*Ratios:* Wings/Body **140%**

*Antennae:* dark brown; long 3rd; hairy; slender; long.

*Head:* bright orange-brown to dark brown; with long, pale hairs; small; translucent pale chestnut ocelli.

*Eyes:* neutral brown, contrasting with rest of head.

*Mouthparts:* chestnut-tipped orange mandibles; small, dark appendages.

*Thorax:* from bright orange-brown to all dark brown, with pale hairs; black beneath; smooth mesoscutum; full-length notaulices; no median line; chestnut tegulae; small rugose scutellum; separate black foveae; glossy mesopleuron with hairy top.

*Legs:* dark chestnut; long, with pale hairs; parts of coxae darker.

*Wings:* clear; pale yellow to neutral brown veins; brown hairs.

*Gaster:* pale to darker chestnut with diagonal streaks of darker from top and bottom along the segments; tuft of long pale hairs at end of ventral spine.



***Cynips longiventris*** Hartig 1840 - agamic & sexual generations

♀ X 1 - **Green velvet-bud gall causer**

**Impression:** DEEP BROWN HEAD & THORAX; BROWN GASTER; YELLOW LEGS; CHESTNUT ANTENNAE. **FOURTEEN** antennal segments.

**Length:** Body **2.5mm**

**Ratios:** Wings/Body **140%**

**Antennae:** chestnut/mid-brown, round, fat pedicel & fat scape; 3rd segment long & straight; tapering slightly.

**Head:** small, black/brown, with pale hairs.

**Eyes:** mid-size, dark.

**Mouthparts:** dirty yellow appendages & yellow mandibles.

**Thorax:** deep brown; unsculpted, shiny mesoscutum; hairy at front; full-length notaulices; no median line; **granular** dark scutellum; glossy, unsculpted mesopleuron.

**Legs:** deep translucent yellow, with dark brown coxae; covered in pale hairs.

**Wings:** clear; strong, mid-brown veins & hairs.

**Gaster:** glossy brown; impunctate; not obviously segmented.

♂ X 2

**Impression:** DEEP BROWN HEAD & THORAX; DARK BROWN GASTER; YELLOW LEGS; DARK ANTENNAE. **FIFTEEN** antennal segments.

**Length:** Body **2.5mm**

**Ratios:** Wings/Body **145%**

**Antennae:** dark black-brown; fat dark chestnut scape & pedicel; 3rd long; slight taper,.

**Head:** deep brown, semi-glossy with dark hairs.

**Eyes:** large, dark; large chestnut ocelli.

**Mouthparts:** yellow mandibles & dirty yellow appendages.

**Thorax:** deep brown, largely unsculpted and glossy; hairy at back and front; glossy, unsculpted mesoscutum; full-length notaulices; very short median line; heavily sculpted scutellum; glossy unsculpted mesopleuron,.

**Legs:** deep yellow, with dark, hairy coxae

**Wings:** clear; strong, mid-brown veins & hairs.

**Gaster:** dark brown, glossy; pointed, round, small; single large segment.



*Cynips longiventris*

**♂ X 8 - Striped-pea gall causer**

*Impression:* CHESTNUT HEAD; CHESTNUT & BLACK THORAX; DARK BROWN GASTER; VARIABLE FROM LIGHT TO DARKER; DARK CHESTNUT LEGS; DARK ANTENNAE. THIRTEEN antennal segments.

*Length:* Body **3.2mm** (2.6-3.8)

*Ratios:* Wings/Body **143%**

*Antennae:* dark & hairy; bulbous scape; long 3rd; distinctly tapered; long segments.

*Head:* rich golden-brown; hairy.

*Eyes:* very dark, medium-sized.

*Mouthparts:* dark appendages and mandibles.

*Thorax:* black & chestnut-brown; very hairy; smooth mesoscutum striped black & chestnut; full-length notaulices; no median line; neutral-brown tegulae; small orange-chestnut rugose scutellum; dark separate foveae; mesopleuron dark smooth & hairy.

*Legs:* golden-brown, very hairy.

*Wings:* clear; pale hairs, with conspicuous dark brown veins, the colour bleeding off the edge of much of the length.

*Gaster:* glossy, dark brown with some paler beneath and along the area of the ventral spine; conspicuous tuft of pale hairs at end of spine.





***Cynips quercusfolii*** Linnaeus 1758 - agamic & sexual generations

♀ X 4 - **Violet-egg gall causer**

Impression: **VARIABLE; TRANSLUCENT YELLOW-BROWN TO DARK BROWN BODY; YELLOW LEGS & ANTENNAE. FOURTEEN** antennal segments.

Length: Body **2.3mm** (1.9-2.7)

Ratios: **Wings/Body 134%**

Antennae: **pale yellow, tapered slightly; hairy.**

Head: **smooth, translucent yellow-brown; ocelli chestnut-yellow.**

Eyes: **large, brown.**

Mouthparts: **bright chestnut-yellow mandibles & appendages.**

Thorax: **translucent yellow-brown; hairless mesoscutum, smooth with faint leathery microsculpture; full-length notaulices; no median line; pale chestnut-straw tegulae; foveae not visible; leathery scutellum with few hairs; mesopleuron with the top heavily sculpted, smooth below.**

Legs: **all yellow but slight brown tinges at top.**

Wings: **clear; brown veins and hairs.**

Gaster: **yellow-brown; segmented; smooth, translucent.**



♂ X 5

Impression: **DARK BROWN BODY; YELLOW-BROWN LEGS; DARK ANTENNAE. FIFTEEN** antennal segments.

Length: Body **2.5mm** (2.2-2.7)

Ratios: **Wings/Body 150%**

Antennae: **medium grey-brown; fat pedicel; long segments; not tapered; hairy.**

Head: **small, dark brown; slight sculpture and neutral hairs; large red-brown ocelli.**

Eyes: **medium-large, dark neutral-brown; chestnut-red ocelli.**

Mouthparts: **bright chestnut-yellow mandibles & appendages.**

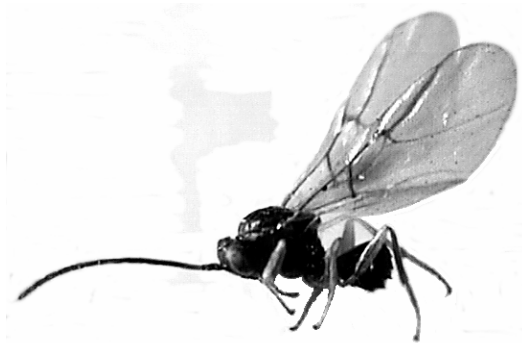
Thorax: **dark brown & glossy; hairless mesoscutum, smooth with faint leathery microsculpture; full-length notaulices; no median line; pale chestnut-straw tegulae; shallow separated foveae; leathery, very hairy scutellum; mesopleuron with the top heavily sculpted, smooth below..**

Legs: **dull yellow to yellow-brown at top;**

**glossy with sparse hairs.**

Wings: **clear; mid-brown veins and hairs.**

Gaster: **dark brown, slender and long, pointed; un-segmented; no sculpture, glossy.**



A63

*-Robin Williams-*



*Cynips quercusfolii*

♂ X 14 - **Cherry gall causer**

*Impression:* HEAD BLACK WITH SOME BROWN; BLACK THORAX; BROWN-TINGED BLACK GASTER; BLACK & DARK BROWN LEGS; DARK ANTENNAE. THIRTEEN antennal segments.

*Length:* Body **3.7mm** (3.5-4.4)

*Ratios:* Wings/Body **135%**

*Antennae:* black; slender; tapered; hairy.

*Head:* black vertex and face; brown around edge of eyes; thickly covered with long pale hairs; ocelli large & dark.

*Eyes:* dark; mid-sized.

*Mouthparts:* dark mandibles and neutral brown appendages.

*Thorax:* black, covered in long pale hairs; mesoscutum only lightly sculpted, long lines of hairs with bare between, giving appearance of stripes; full-length notaulices; no median line; obvious brown tegulae; black granular scutellum tinged with dark brown; large heavily sculpted glossy foveae; mesopleuron hairy & smooth.

*Legs:* black with dark brown tints in parts.

*Wings:* clear; long and wide with many dark hairs; dark rich brown veins, some of which bleed colour into surrounding membrane.

*Gaster:* largely black, sometimes with some brown beneath; the basal part with dense pale hairs; shiny; segmented.



*oak-galls - volume two*

*descriptions/causers*

## **Neuroterus, Hartig 1840**

**- some common factors**

SHORT PRONOTUM

RADIAL CELL OPEN

FACE AT MOST WITH A FEW RADIATING STRIAE

NOTAULICES WEAK, INCOMPLETE OR ABSENT

MESOS CUTUM DEEPLY EMARGINATE, JOINED TO SCUTELLUM WITH A CARINA, BUT NO SUTURE



*Neuroterus albipes* (Schenck 1863) - agamic & sexual generations

♀ X 5 - **Schenk's gall causer**

**Impression:** BLACK HEAD & THORAX; BLACK-BROWN GASTER; LEGS LARGELY DARK YELLOW; GOLDEN ANTENNAE WITH DARK ENDS. FOURTEEN or FIFTEEN antennal segments.

**Length:** Body 1.7mm (1.1-2.5)

**Ratios:** wings/body 147%

**Antennae:** yellow tapering to dark last half; globular yellow pedicel & scape; long 3rd; slightly tapered; with short hairs.

**Head:** small; black; ocelli almost white.

**Eyes:** large, dark brown.

**Mouthparts:** dark appendages and mandibles.

**Thorax:** dark brown; mesoscutum with transverse sculpture; full-length notaulices; very short median line; straw-coloured tegulae; scutellum sculpted and black; no foveae; shiny mesopleuron with minimal longitudinal striae.

**Legs:** hairy, the top of coxae brown, the rest dark yellow with darker claws.

**Wings:** clear; pale brown veins and pale hairs.

**Gaster:** dark brown to black; glossy; segmented; part-testaceous ploughshare.



♂ X 4

**Impression:** BROWN BODY, ANTENNAE & LEGS; PETIOLE. FIFTEEN antennal segments.

**Length:** Body 1.6mm (1.6-1.8)

**Ratios:** Wings/Body 145%

**Antennae:** brown.

**Head:** dark brown; leathery sculpture with hairs behind.

**Eyes:** large, dark.

**Mouthparts:** brown appendages, yellowish mandibles.

**Thorax:** brown; mesoscutum glossy, with some light leathery sculpture, heavy carina round back and sides, hairless; indistinct full-length notaulices; short, faint median line; scutellum with leathery sculpture, some long hairs, heavy carina on sides joining at rear; mesopleuron semi-glossy & sculpted.

**Legs:** brown, with paler joints and yellow-tinged tibiae.

**Wings:** clear; mid brown veins and hairs.

**Gaster:** glossy, dark brown; slender, virtually hairless; some pale 'zigzag' edges at back; segmented; mid-length petiole.



*Neuroterus albipes*

♂ X 11 - **Smooth spangle causer**

*Impression:* YELLOW-BROWN HEAD; DARK BROWN THORAX & GASTER; BROWN LEGS; DARK ANTENNAE. FIFTEEN antennal segments.

*Length:* Body **2.5mm** (1.7-3.0)

*Ratios:* Wings/Body **128%**

*Antennae:* mid-brown, with pale joints, straight 3rd; hairy; gradually tapering.

*Head:* rich yellow-brown, mainly hairless.

*Eyes:* pale neutral; mid-sized.

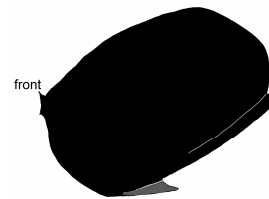
*Mouthparts:* small dark appendages and mandibles.

*Thorax:* dark brown; hairless & largely unsculpted; mesoscutum smooth with faint sculpture; indistinct impression of part-notaulices; no median line; translucent pale brown tegulae; narrow lightly sculpted, sparsely-haired scutellum; merged single fovea; mesopleuron smooth, with sparse hairs at back;

*Legs:* dark brown glossy coxae and femora; pale femur end & trochanter; dark yellow-brown tibia and paler tarsus; all hairy.

*Wings:* clear; dark brown veins and hairs.

*Gaster:* dark brown, shiny; segmented but appearing smooth; large from side with quite distinctive shape.



*Neuroterus anthracinus* (= *Andricus anthracina*) (Curtis

1838) - agamic & sexual generations.

♀ X 5

**Impression:** BLACK BODY; YELLOW LEGS; DARK ANTENNAE. FIFTEEN antennal segments.

**Length:** Body 2.2mm (2.0-2.3)

**Ratios:** Wings/Body 144%

**Antennae:** dark; first three funicular segments chestnut; fat scape and swollen pedicel; pale hairs and sensillae; slender; tapered.

**head:** black; lightly sculpted; with sparse, pale hair.

**eyes:** dark, mid-size.

**mouthparts:** chestnut bifurcate mandibles with black tips; mid-brown hairy appendages.

**thorax:** black; mesoscutum, with faintly leathery surface, semi-glossy; full-length notaulices; no median line; yellow tegulae; lightly leathery, hairy scutellum; faint part-separated fovea; mesopleuron sculpted.

**legs:** all clear yellow, except for dark top to coxae and claws; hairy.

**wings:** pale hairs; dark neutral-brown veins that tend to bleed into surrounds; small brown cloud at middle/bottom of wing.

**gaster:** black; multi-segmented, with large paler ploughshare at rear; pale hairs on first segment; no pubescence or puncturation.



♂ X 1

**Impression:** DARK BROWN BODY; YELLOW-BROWN LEGS; NEUTRAL-BROWN ANTENNAE. FIFTEEN or SIXTEEN antennal segments.

**Length:** Body 3.3mm

**Ratios:** Wings/Body 131%

**Antennae:** neutral-brown, thin scape and long pedicel; 3rd longish, straight; not tapered; slender; quite long;

**Head:** very dark brown, lightly sculpted & semi-glossy; hairy.

**Eyes:** large, very dark brown.

**Mouthparts:** pale appendages, yellow mandibles with heavy dark chestnut tips.

**Thorax:** glossy dark brown; mesoscutum with little obvious sculpture & no hairs on top; full-length notaulices; no median line; lightly sculpted scutellum; no obvious foveae; mesopleuron semi-glossy, with faint, indeterminate sculpture.

**Legs:** translucent yellow-brown, darker on coxae and femora; pale hairs.

**Wings:** heavy, yellow-brown veins, dark hairs; clear.

**Gaster:** dark brown, semi-glossy; small petiole, tapered to thick end; segmented, with toothed edges; some hairs.



*Neuroterus anthracinus*

**♂ X 2 - Oyster gall causer**

**Impression:** CHESTNUT AND DARK HEAD; CHESTNUT THORAX WITH BLACK MARKINGS; YELLOW-BROWN GASTER; YELLOW LEGS; YELLOW-BROWN ANTENNAE. THIRTEEN antennal segments.

**Length:** Body **2.2mm**

**Ratios:** Wings/Body **133%**

**Antennae:** rich yellow-brown, with final eight darker neutral-brown; fat scape and pedicel; short 3rd; tapered.

**Head:** small; chestnut with black between ocelli; faintly coriaceous; hairy face; ocelli dirty yellow.

**Eyes:** large, dark-neutral.

**Mouthparts:** translucent yellow-brown appendages and darker mandibles.

**Thorax:** chestnut with black joints to plates; largely hairless shiny mesoscutum with faint coriaceous sculpture; full-length notaulices; no median line; testaceous tegulae; round hairy coriaceous scutellum; glossy brown separated foveae; glossy mesopleuron.

**Legs:** translucent yellow.

**Wings:** clear; long yellow-brown veins and hairs.

**Gaster:** yellow-brown with paler segment edges; heavily segmented; angular; deep; semi-translucent; shiny.



***Neuroterus aprilinus*** (Giraud 1859) - agamic & sexual generations

♀ X 2 - **April-bud gall causer**

**Impression:** BLACK HEAD; DARK THORAX & GASTER; BROWN TO YELLOW LEGS; NEUTRAL-BROWN ANTENNAE. FOURTEEN antennal segments.

**Length:** Body 2.2mm

**Ratios:** Wings/Body 138%

**Antennae:** neutral-brown, long thin straight 3<sup>rd</sup>; silvery flattened hairs; not tapered.

**Head:** black; dull shine, with light sculpture.

**Eyes:** very large, dark brown.

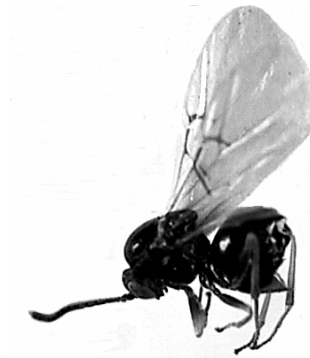
**Mouthparts:** black appendages & mandibles.

**Thorax:** very dark brown, with chestnut tinge; lightly sculpted & semi-glossy; hunched; no notaulices; no median line.

**Legs:** pale, dull yellow; tapering from mid-femur to brown coxae.

**Wings:** clear; yellow-brown veins, with pale yellow hairs.

**Gaster:** very dark, with paler round the area of the ovipositor; deep; segmented with serrated edges; mostly glossy.



♂ X 1

**Impression:** DARK BROWN BODY, LEGS & ANTENNAE; PETIOLE. FOURTEEN antennal segments.

**Length:** Body 2.6 mm

**Ratios:** Wings/Body 156%

**Antennae:** dark brown; small round pedicel and short, conical scape; straight, short 3<sup>rd</sup>; hairy; quite sturdy; not tapered.

**Head:** very dark brown; hairy and reticulated.

**Eyes:** large, brown.

**Mouthparts:** gold-brown mandibles; small mid-brown appendages.

**Thorax:** all rich dark brown; mesoscutum shining, with light reticulation in centre; no notaulices; no median line; scutellum with leathery sculpture & some hairs; single foveal pit; mesopleuron shiny but lightly reticulated.

**Legs:** dark brown coxae tapering down to paler tarsi; hairy.

**Wings:** clear; pale hairs and dark veins.

**Gaster:** rich dark brown; tall, thin and short, segmented; glossy, with double band of hairs at the back; short but definite petiole.





*Neuroterus apralinus*

♂ X 1

**Impression:** BROWN HEAD; TRANSLUCENT GOLDEN-BROWN THORAX & GASTER; GOLDEN-BROWN LEGS & ANTENNAE; PETIOLE. THIRTEEN antennal segments.

**Length:** Body **1.3mm**

**Ratios:** Wings/Body **150%**

**Antennae:** golden-brown with darker tip; tapered; long pedicel; fattish scape; straight 3<sup>rd</sup>; hairy.

**Head:** brown, glossy with some minute sculpture.

**Eyes:** small, dark.

**Mouthparts:** dark appendages and mandibles.

**Thorax:** translucent golden-brown; mesoscutum glossy, no hairs or microsculpture; no notaulices; no median line; scutellum with some hairs and sculpture; mesopleuron glossy, unsculpted.

**Legs:** golden-brown, very hairy.

**Wings:** clear; pale hairs and pale brown veins.

**Gaster:** translucent golden-brown, with a brown band around the front; tall and thin; segmented, though not obviously so; short petiole.



*Neuroterus numismalis* (Geoffroy in Fourcroy 1785) - agamic & sexual generations

♀ X 4 - **Blister gall causer**

*Impression:* BROWN BODY & LEGS; YELLOW-BROWN ANTENNAE. FOURTEEN antennal segments.

*Length:* Body: **2.1mm** (1.8-2.4)

*Ratios:* Wings/Body: **162%**

*Antennae:* mid yellow-brown; fat, hairy pedicel, conical scape; long, thin 3rd, slightly clavate; small hairs.

*Head:* dark brown; shiny, lightly reticulated.

*Eyes:* dark neutral brown, large.

*Mouthparts:* brown mandibles with yellow streaks; dark appendages.

*Thorax:* brown, shiny; mesoscutum smooth, nearly hairless; no notaulices; no median line; scutellum small, rounded, lightly sculpted and sparsely hairy; very shallow single foveal pit; mesopleuron shiny but longitudinally striate.

*Legs:* mid-brown, tapering to paler tarsi; pale joints; hairy.

*Wings:* clear; pale brown hairs and dark veins.

*Gaster:* mid-brown; smooth with much fine microsculpture; band of hairs at back; short, upright and not obviously segmented; large 'ploughshare' beneath.



♂ X 3

*Impression:* DARK BROWN HEAD; MID-BROWN THORAX & GASTER; LEGS TESTACEOUS; ANTENNAE PALE STRAW. FIFTEEN antennal segments.

*Length:* Body **1.9mm** (1.4-2.2)

*Ratios:* Wings/Body **141%**

*Antennae:* pale straw-coloured; fat, short, brown scape.

*Head:* dark neutral-brown, lightly sculpted only.

*Eyes:* large, dark.

*Mouthparts:* testaceous appendages, brown mandibles.

*Thorax:* mid neutral-brown sides, darker above; mesoscutum largely unsculpted; no notaulices; no median line; tegulae pale; scutellum with little sculpture; separated foveae; dull mesopleuron.

*Legs:* back coxae brown; the remainder pale testaceous.

*Wings:* clear; heavy brown hairs; brown veins; open radial cell.

*Gaster:* mid-brown, darker beneath; distinct long, thin petiole; blocky, segmented; unsculpted.



*Neuroterus numismalis*

♂ X 5 - **Silk button causer**

**Impression:** BLACK HEAD & THORAX, NEUTRAL-BROWN GASTER; DARK & YELLOW LEGS; DARK BROWN ANTENNAE. FIFTEEN antennal segments.

**Length:** Body **2.5mm** (2.4-2.6)

**Ratios:** Wings/Body **137%**

**Antennae:** dark brown; short scape; large rounded pedicel; very long 3rd.

**Head:** black, granulated; small, pointed; ocelli pale straw.

**Eyes:** medium-sized, pale brown.

**Mouthparts:** mid-brown appendages and mandibles.

**Thorax:** black, with pale hairs; mesoscutum shiny, with some light leathery sculpture, mainly hairless short notaulices at back; no median line; pale tegulae; rugose scutellum with hairs; merged single fovea; mesopleuron rugose with hairs only on top edge.

**Legs:** dark coxae and femora gradually lightening over rest; pale joints.

**Wings:** clear; dark brown veins and hairs; long.

**Gaster:** dark neutral-brown with paler beneath & along ploughshare; shiny; trapezoid and bulky from side; segmented, with hairy back end.



*Neuroterus quercusbaccarum* (Linnaeus 1758) - agamic & sexual

generations

♀ X 12 - **Currant gall causer**

**Impression:** DARK NEUTRAL BROWN BODY; YELLOW LEGS; YELLOW-BROWN ANTENNAE. FIFTEEN antennal segments.

**Length:** Body 2.7mm (2.5-2.9)

**Ratios:** Wings/Body 130%

**Antennae:** yellow-brown; yellow scape & pedicel; long 3rd segment; tapered lightly; hairy.

**Head:** very dark neutral brown; shiny; some light sculpture.

**Eyes:** bright pale brown, quite large and long.

**Mouthparts:** small pale appendages and chestnut mandibles.

**Thorax:** very dark neutral-brown, shiny; mesothorax with faint sculpture; no notaulices; no median line; straw-coloured tegulae; merged single fovea; scutellum faintly sculpted; mesopleuron smooth.

**Legs:** glowing, semi-translucent yellow, with sparse, pale, pubescence.

**Wings:** clear; prominent dark brown veins; neutral hairs; long.

**Gaster:** very dark neutral-brown; blocky but with only tiny, short petiole; segmented, with conspicuously jagged appearance to edge.



♂ X 21

**Impression:** DARK BROWN BODY; PALE STRAW LEGS; BRASSY ANTENNAE; PETIOLE. FIFTEEN antennal segments.

**Length:** Body 2.9mm (2.3-3.2)

**Ratios:** Wings/Body 127%

**Antennae:** pale brassy; long, straight 3rd; slender; short hairs.

**Head:** dark brown, small, with short decumbent hairs facing forward.

**Eyes:** dark brown, with conspicuous pale circumference, large.

**Mouthparts:** dark and do not show up, though quite heavy.

**Thorax:** very dark brown, hairless and shiny; mesoscutum smooth; no notaulices; no median line; straw-coloured tegulae; merged single fovea; scutellum smooth with sparse hairs; mesopleuron smooth with indistinct angled striae at top.

**Legs:** brown top to coxae, otherwise pale translucent straw; slender & long.

**Wings:** clear; pale hairs; veins dark brown & conspicuous; long,.

**Gaster:** dark brown, with long, thin petiole; thin & glossy; sparse hairs round rear only.



*Neuroterus quercusbaccarum*

♂ X 95 - **Common spangle causer**

*Impression:* BLACK HEAD & THORAX; BLACK TO VERY DARK BROWN GASTER; LARGELY DARK BROWN LEGS; DARK BRASSY ANTENNAE. FIFTEEN or SIXTEEN antennal segments.

*Length:* **2.5mm** (2.1-3.1)

*Ratios:* Wings/Body **137%**

*Antennae:* dark to dark-brassy; dirty-yellow scape & pedicel; normal 3rd; long; slender; lightly hairy; **tapering.**

*Head:* **black;** small and bent down sharply, hairless; lightly sculpted; ocelli .

*Eyes:* mid-sized, **black.**

*Mouthparts:* rich brown mandibles; dark neutral-brown appendages.

*Thorax:* **black;** smooth, mainly hairless; faintly striate mesoscutum striate; full-length notaulices; no median line; brown & gold tegulae; merged single fovea; smooth but hairy scutellum; mesopleuron heavily longitudinally striate.

*Legs:* dark brown, blending into yellow joints; hairy.

*Wings:* clear; thick brown veins; brown fairly dense hairs; project well beyond body;.

*Gaster:* mainly black, blending into a yellow-brown ventral spine; moderately glossy; evenly segmented.



*Neuroterus saliens* (Kollar 1857) sexual & agamic generations

♀ X 1 - **gall causer**

**Impression:** BLACK BODY; MAINLY TESTACEOUS LEGS; BLACK & TESTACEOUS ANTENNAE. FIFTEEN antennal segments.

**Length:** Body 2.3mm

**Ratios:** Wings/Body 122%.

**Antennae:** black except for testaceous first three segments.

**Head:** black; faintly micro-sculpted only; chestnut ocelli.

**Eyes:** mid-sized; black.

**Mouthparts:** dark mandibles; testaceous appendages.

**Thorax:** black; pronotum lightly micro-sculpted; glossy mesoscutum; no notaulices; no median line; testaceous tegulae; no obvious fovea; micro-sculpted scutellum; mesopleuron with leathery micro-sculpture.

**Legs:** front two pairs of legs all translucent testaceous; the rear coxae testaceous-brown with black base; brown tinted femora; tibiae brown-translucent, the rest testaceous; all claws dark.

**Wings:** clear; dark veins in upper half; basal veins largely clear; long slender open radial cell.

**Gaster:** black; glossy; segmented; slender ventral spine with sparse hairs on side and extending past tip.



♂ X 2

**Impression:** BLACK BODY; MAINLY TESTACEOUS LEGS; BLACK & TESTACEOUS ANTENNAE. FIFTEEN antennal segments.

**Length:** Body 2.0mm.

**Ratios:** Wings/Body 134%.

**Antennae:** black except for testaceous first three segments; slender; long.

**Head:** black; faintly micro-sculpted only; chestnut ocelli.

**Eyes:** Large.

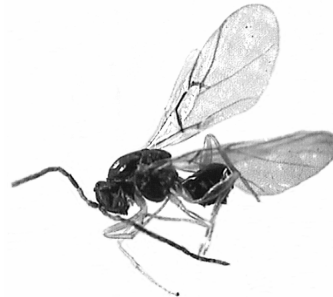
**Mouthparts:** dark mandibles; testaceous appendages

**Thorax:** black; pronotum lightly micro-sculpted; glossy mesoscutum; no notaulices; no median line; testaceous tegulae; no obvious fovea; micro-sculpted scutellum; mesopleuron with leathery micro-sculpture

**Legs:** front two pairs of legs all translucent testaceous; the rear coxae testaceous-brown with black base; brown tinted femora; tibiae brown-translucent, the rest testaceous; all claws dark

**Wings:** clear; dark veins in upper half; basal veins largely clear; long slender open radial cell

**Gaster:** black with short narrow dirty testaceous petiole; glossy; segmented; blocky.



*Neuroterus saliens*

**♂ - gall causer**

Impression:.

Length: **Body mm**

Ratios: **Wings/Body %**.

Antennae:.

Head: ; **ocelli**.

Eyes:.

Mouthparts: **mandibles; appendages**.

Thorax: ; **pronotum; mesoscutum; notaulices; median line; tegulae; foveae; scutellum; mesopleuron**.

Legs:.

Wings:.

Gaster:.



**Neuroterus tricolor** (Hartig 1841) - agamic & sexual generations

♀ X 6 - **Hairy-pea gall causer**

**Impression:** DARK NEUTRAL-BROWN HEAD & THORAX; GOLD & BROWN GASTER; GOLD LEGS; DARK ANTENNAE. FIFTEEN antennal segments.

**Length:** Body **2.2mm.** (2.0-2.4)

**Ratios:** Wings/Body **121%**

**Antennae:** dark; golden scape, pedicel & base of 3<sup>rd</sup> segment; tapered.

**Head:** dark neutral-brown; reticulated; pale chestnut ocelli.

**Eyes:** large & dark.

**Mouthparts:** pale appendages & mandibles.

**Thorax:** dark neutral-brown; mesoscutum with small reticulations; full-length notaulices; no median line; **tegulae** straw-coloured; scutellum granulated; shiny but sculpted mesopleuron;.

**Legs:** all translucent gold.

**Wings:** clear; plentiful chestnut hairs; chestnut veins with colour bleeding into parts of surround.

**Gaster:** brown at back; more or less translucent gold on rest; shiny; unsegmented

♂ X 4

**Impression:** SLENDER; BROWN BODY, YELLOW LEGS; BROWN ANTENNAE; PETIOLE. FIFTEEN antennal segments.

**Length:** Body **2.5mm** (2.4-2.5)

**Ratios:** Wings/Body **140%**

**Antennae:** slender brown, pedicel long; scape flask-shaped; 3rd segment long and straight; hairy; not tapered.

**Head:** dark brown; shiny, but with sizeable sculpting, hairy at back.

**Eyes:** large & dark.

**Mouthparts:** yellow mandibles and darker appendages.

**Thorax:** brown & translucent; mesoscutum glossy, faintly sculpted and hairless, with distinct carina at back and on sides; very faint  $\frac{3}{4}$  length notaulices; no median line; scutellum blunt-ended, semi-shiny with a surrounding carina and others on top; mesopleuron hairless, shiny and with longitudinal striae.

**Legs:** yellow, with dark claws; pale hairs.

**Wings:** clear; pale hairs & brown veins.

**Gaster:** brown with long yellow petiole; yellow basal half of 2nd segment.





*Neuroterus tricolor*

**♂ X 1 - Cupped spangle causer**

**Impression:** BLACK HEAD & THORAX; BLACK GASTER WITH TRANSLUCENT CHESTNUT BENEATH;  
**DARK LEGS WITH YELLOW; BROWN ANTENNAE;** FIFTEEN antennal segments.

**Length:** Body **2.2mm**

**Ratios:** Wings/Body **140%**

**Antennae:** glossy dark brown flagellum; large, long chestnut pedicel and fat scape.

**Head:** black; finely rugose with pale chestnut ocelli; distinct genal furrow.

**Eyes:** black; quite large.

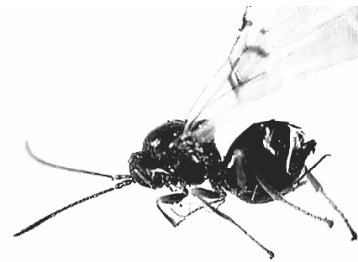
**Mouthparts:** dark chestnut mandibles and brown appendages.

**Thorax:** black; semi-glossy mesoscutum very lightly sculpted; full-length notaulices, weak at front; no median line; tegulae testaceous; scutellum semi-glossy, lightly sculpted; semi-circular joined foveae; mesopleuron semi-glossy with longitudinal striae.

**Legs:** dark brown coxae with yellow-tinted ends; brown femora with yellow-brown joints; brown tibiae with yellow tarsi; dark claws; hairy.

**Wings:** clear; veins rich brown, with the colour bleeding off into clear wings around the first abscissa of the radius; pale, neutral hairs; open radial cell.

**Gaster:** black with lower edge translucent chestnut; glossy with distinct segments and saw-edged appearance; almost circular from the side; thin.



*oak-falls - volume two*

*descriptions/causers*

## **Trigonaspis, Hartig 1840**

**- Some common factors**

SHORT PRONOTUM

FACE AT MOST WITH A FEW RADIATING STRIAE

VENTRAL SPINE SHORT, WITH TUFT PROJECTING BEYOND TIP



*Trigonaspis megaptera* (Panzer 1801) - agamic & sexual generations

♀ X 4 - **Pink-wax gall causer**

**Impression:** DARK BROWN HEAD & THORAX; TRANSLUCENT GOLDEN-BROWN GASTER; YELLOW LEGS; DARK BROWN ANTENNAE. THIRTEEN or FOURTEEN antennal segments.

**Length:** Body **3.6mm** (3.4-3.9)

**Ratios:** Wings/Body **136%**

**Antennae:** dark brown; slight taper; long segments; hairy.

**Head:** dull dark brown; slight sculpture.

**Eyes:** large; dark neutral brown.

**Mouthparts:** pale yellow appendages; chestnut-tipped yellow mandibles.

**Thorax:** black; high-gloss mesoscutum; full-length notaulices; dull, sculpted scutellum.

**Legs:** all yellow, hairy.

**Wings:** clear; mid-brown veins and hairs.

**Gaster:** translucent yellow-brown; largely un-segmented; glossy.

♂ X 3

**Impression:** DARK BROWN HEAD; BLACK THORAX; YELLOW-BROWN GASTER; YELLOW LEGS; DARK BROWN ANTENNAE. FIFTEEN antennal segments.

**Length:** Body **2.8mm** (2.3-3.1)

**Ratios:** Wings/Body **158%**

**Antennae:** dark brown; slight taper; long segments; hairy.

**Head:** dull dark brown; some slight sculpture.

**Eyes:** large; dark neutral brown.

**Mouthparts:** pale yellow appendages; chestnut-tipped yellow mandibles.

**Thorax:** black; high-gloss mesoscutum; full-length notaulices; dull, sculpted scutellum.

**Legs:** all yellow, hairy.

**Wings:** clear; mid-brown veins and hairs.

**Gaster:** translucent yellow-brown; glossy; segmented.



*Trigonaspis megaptera*

♂ X 1 - **Kidney gall causer**

Impression: WINGLESS; MID-BROWN HEAD; YELLOW-BROWN THORAX, GASTER, LEGS & ANTENNAE. THIRTEEN antennal segments.

Length: Body **1.8mm**

Ratios: Wings/Body **0%**

Antennae: yellow-brown; tapering, with short square segments.

Head: mid brown; small chestnut ocelli.

Eyes: smallish, dark brown.

Mouthparts: yellow-brown mandibles and appendages.

Thorax: dark yellow-brown, shining; mesoscutum glossy, unsculpted; no notaulices; no median line; no tegulae; broad single fovea; scutellum lightly sculpted and shiny; mesopleuron dark & sculpted irregularly.

Legs: yellow-brown; translucent; fat thighs,.

Wings: none present.

Gaster: yellow-brown, deep & bulky; only faint traces of segments; shiny.



## **Other causers - Acari**

*Epitrimerus cristatus* (Nalepa) - sexual generation

♀ X 1 **The Bud gall causer**

Impression: antennal segments.

Length: **Body mm**

Ratios: **Wings/Body %**

Antennae: .

Head:

Eyes:

Mouthparts:

Thorax:

Legs:

Wings:

Abdomen:

♂

Impression: antennal segments.

Length: **Body mm.**

Ratios: **Wings/Body %.**

Antennae: .

Head:

Eyes: .

Mouthparts:

Thorax:

Legs:

Wings:

Abdomen:



## **Lepidoptera**

*Heliozela sericiella* (Haworth) - sexual generation

♀ X 0

**Impression:** HEAD, THORAX & ANTENNAE SHINING BRONZE-GREY; BANDED PALE BROWN ABDOMEN; FOREWING SHINING GREY WITH A PALE SPOT IN MIDDLE; HIND WING GREY.

**Length:** Wingspan **6-8mm**

**Antennae:** shining bronze-grey

**Head:** shining bronze-grey

**Eyes:** small; dark.

**Thorax:** shining bronze-grey

**Legs:**

**Wings:** forewing grey, with one or two indistinct pale spots; hind wing grey; both wings with fans of long hairs edging them at tips and behind.

**Abdomen:** banded pale brown.



Based on Harley Books illustration

♂ X 0

**Impression:** HEAD, THORAX & ANTENNAE SHINING BRONZE-GREY; BANDED PALE BROWN ABDOMEN; FOREWING SHINING GREY WITH A PALE SPOT IN MIDDLE; HIND WING GREY.

**Length:** Wingspan **6-8mm**

**Antennae:** shining bronze-grey

**Head:** shining bronze-grey

**Eyes:** small; dark.

**Thorax:** shining bronze-grey

**Legs:**

**Wings:** forewing grey, with one or two indistinct pale spots; hind wing grey; both wings with fans of long hairs edging them at tips and behind.

**Abdomen:** banded pale brown.



# Lepidoptera

*Stenolechia gemella* (Linnaeus) - sexual generation

♀ X 0

Impression: PALE BODY; DELICATELY MARKED, HEAVILY-FRINGED WINGS; DARK BANDED ANTENNAE & LEGS.

Length: Wingspan 10/11mm

Ratios: Wings/Body %

Antennae: dark with lighter bands.

Head: white

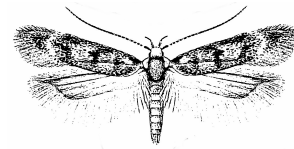
Eyes: small; dark.

Thorax: white mixed with defined dark edges; white tegulae.

Legs: hind pair pale ochre; other two pairs dark with banded tarsi.

Wings: forewing very pale straw with more or less dark, pale and ochre-tipped scales; hindwing pale, darker at tip; characteristic long fringes to end of forewing and behind the hindwing.

Abdomen: light grey-brown.



Based on Harley Books illustration

♂

Impression: PALE BODY; DELICATELY MARKED, HEAVILY-FRINGED WINGS; DARK BANDED ANTENNAE & LEGS.

Length: Wingspan 10/11mm

Ratios: Wings/Body %

Antennae: dark with lighter bands.

Head: white.

Eyes: small; dark.

Thorax: white mixed with defined dark edges; white tegulae.

Legs: hind pair pale ochre; other two pairs dark with banded tarsi.

Wings: forewing very pale straw with more or less dark, pale and ochre-tipped scales; hindwing pale, darker at tip; characteristic long fringes to end of forewing and behind the hindwing.

Abdomen: light grey-brown.



# Hemiptera

*Asterodiaspis variolosa* (Ratzeburg 1870) - sexual generation

♀ X 0

Impression: antennal segments.

Length: **Body mm**

Ratios: **Wings/Body %**

Antennae: .

Head:

Eyes:

Mouthparts:

Thorax:

Legs:

Wings:

Abdomen:

♂

Impression: antennal segments.

Length: **Body mm**

Ratios: **Wings/Body %**

Antennae: .

Head:

Eyes: .

Mouthparts:

Thorax:

Legs:

Wings:

Abdomen:





## Hemiptera

*Trioza remota*, Förster 1848 - sexual generation

♀ X 0

Impression: **SHORT, PALE BODY; LONG, WIDE WINGS WITH PROMINENT NETWORK OF VEINS. TEN antennal segments.**

Length: **Body 2.5mm**

Ratios: **Wings/Body 132%**

Antennae: **yellow, darkening towards tip, little taper; round segments with stalk between.**

Head: **yellow, marked unevenly with brown; small.**

Eyes: **brown, button-like.**

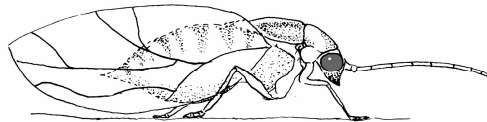
Mouthparts: **prominent, long, sharp dark appendages**

Thorax: **yellow, marked with wide brown lines; hunched.**

Legs: **yellow, with 4 tarsal segments.**

Wings: **clear with yellow veins in prominent, netted form; arched over back and side.**

Abdomen: **yellow with brown barring.**



♂

Impression: **SHORT, PALE BODY; LONG, WIDE WINGS WITH PROMINENT NETWORK OF VEINS. TEN antennal segments.**

Length: **Body 2.5mm**

Ratios: **Wings/Body 132%**

Antennae: .

Head: **yellow, marked unevenly with brown; small.**

Eyes: **brown, button-like.**

Mouthparts: **prominent, long, sharp dark appendages**

Thorax: **yellow, marked with wide brown lines; hunched**

Legs: **yellow, with 4 tarsal segments.**

Wings: **clear with yellow veins in prominent, netted form; arched over back and side.**

Abdomen: **yellow with brown barring.**



## **Diptera**

Gall-midges

*Arnoldia libera* (Kieffer 1909) - sexual generation

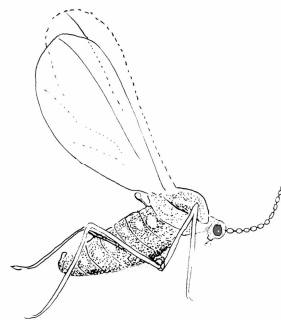
*Macrodiplosis pustularis (=dryobia)* (Bremi 1847) - sexual generation

*Macrodiplosis roboris (=volvans)* (Hardy 1854) - sexual generation

*Polystepha malpighii* (Kieffer 1909) - sexual generation

Although the galls, and to some extent the larvae, are well known, the adults are not; a general description is as follows (kindly supplied by Keith Harris):

Small non-biting midges, often with red or orange body colour, clothed in hairs and/or scales. Body length about 2-3 mm; antennae long, with 12 or more bead-like flagellomeres; eyes relatively large, holoptic; mouth-parts reduced but with short maxillary palps; wing venation reduced, with only three obvious longitudinal veins; legs long (Fig. use your fig.). Larvae are about 2-3 mm long when fully grown, with a median sclerotized sternal spatula ventrally on the first thoracic segment, and are white, pale orange or yellow, with no obvious setation.



# Cynipid descriptions - inquilines

SPECIES	PAGE
Ceroptres	A90
Saphonecrus	A92
Synergus	A94



*oak-falls - volume two*

*descriptions/inquilines*

**Ceroptres, Hartig 1840**  
**- common factors**

LONG PRONOTUM

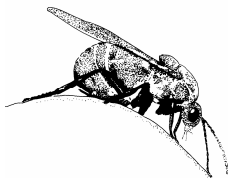
TERGITES 2-7 FREE (NOT FUSED)

1st GASTRAL SEGMENT (PETIOLE) SMOOTH & SHINING)

VENTRAL SPINE OF ♀ SHORT

FACIAL STRIAE FEW AND SHORT

VERTICAL FACIAL CARINAE FORMING CANYON



*Ceroptres arator* Hartig 1841

♀ X 14

**Impression:** VERY DARK BROWN BODY; YELLOW-BROWN LEGS & ANTENNAE. THIRTEEN antennal segments.

**Length:** Body 1.7mm (1.2-2.2)

**Ratios:** Head+Thorax/Body 56%; Antenna/Body 67%; Wing/Body 116%.

**Antennae:** yellow-brown, uniform; long but tapering to clubbed end; dark scape; large, globular pedicel.

**Head:** black, lightly granular; wide; distinctive sunken canyon between carinae on face; short, pale hairs; small chestnut ocelli.

**Eyes:** medium-sized; dark, but not obvious.

**Mouthparts:** pale brown mandibles; small yellow appendages.

**Thorax:** black; dull mesoscutum with close transverse rugulae; full-length notaulices; short median line; dark tegulae; rugose scutellum; small dull separated foveae; smooth glossy mesopleuron with light sculpture at extreme top.

**Legs:** tapering from brownish coxae to rich yellow, with dark claws.

**Wings:** clear; very pale veins and hairs.

**Gaster:** dark brown; glossy; segmented; not punctate.



♂ X 6

**Impression:** VERY DARK BROWN HEAD; DARK BROWN THORAX & GASTER; YELLOW LEGS AND ANTENNAE. FOURTEEN or FIFTEEN antennal segments.

**Length:** Body 1.3mm (1.2-1.5)

**Ratios:** Head+Thorax/Body 56%; Antenna/Body 73%; Wing/Body 118%.

**Antennae:** all yellow except dark brown scape; globular pedicel; tapered to club.

**Head:** very dark brown, lightly granular; wide; distinctive canyon between carinae on face; short, pale hairs

**Eyes:** medium-sized, neutral.

**Mouthparts:** small yellow appendages; chestnut-tipped pale mandibles.

**Thorax:** dark brown; sculpted with many white hairs; full-length notaulices; short median line; dark tegulae.

**Legs:** all yellow except for top of coxae, which taper into mid-brown.

**Wings:** clear; pale hairs and veins; rounded.

**Gaster:** dark brown, multi-segmented; glossy; not punctate.



## **Saphonecrus, Dalla Torre & Kieffer 1910**

**- some common factors**

LONG PRONOTUM

TERGITE 2-3 FUSED INTO ONE MAJOR SEGMENT

1st GASTRAL SEGMENT (PETIOLE) LONGITUDINALLY GROOVED

NOTAULICES ABSENT AT FRONT, INDISTINCT

RADIAL CELL OPEN

FEMALE - ANTENNAL SEGMENTS 13

MALE - USUALLY 14, SOMETIMES 15 SEGMENTS

RADIATING FACIAL STRIAE



*Saphonecrus connatus* (Hartig 1840)

♀ X 8

**Impression:** BLACK HEAD & THORAX; DARK BROWN GASTER; YELLOW LEGS & ANTENNAE. THIRTEEN antennal segments.

**Length:** Body 1.5mm (1.3-1.6)

**Ratios:** Head+Thorax/Body 55%; Antenna/Body 62%; Wing/Body 114%.

**Antennae:** rich chestnut-yellow, with darker brown scape; long pedicel like a normal segment; straight, short 3rd; significant degree of taper.

**Head:** black to dark neutral-brown; short pale hairs; lightly coriaceous; pale translucent ocelli.

**Eyes:** large, neutral.

**Mouthparts:** dark-tipped rich yellow contrasting mandibles; small yellow appendages.

**Thorax:** black with slight sheen; slightly hairy mesoscutum with cross-striae & faint microsculpture between; half-length notaulices; no median line pale neutral-brown tegulae; separated foveae; lightly hairy rugose scutellum; mesepimeron with longitudinal striae or folds.

**Legs:** pale, bright yellow, with darker brown, glossy coxae.

**Wings:** clear; pale yellow hairs and veins; open radial cell.

**Gaster:** dark neutral-brown; one main segment; glossy; deep; not punctate; long slender ventral spine; long testaceous ploughshare.



♂ X 9

**Impression:** BLACK HEAD & THORAX; VERY DARK BROWN GASTER; YELLOW LEGS & ANTENNAE. FIFTEEN antennal segments.

**Length:** Body 1.4mm (1.1-1.8)

**Ratios:** Head+Thorax/Body 58%; Antenna/Body 72%; Wing/Body 121%.

**Antennae:** yellow, merging into slightly darker end; long, dark brown scape; pedicel shorter than that of female; sharply bent short third segment; slender; strongly tapering.

**Head:** dark, neutral brown with short, pale hairs; lightly sculpted; small pale ocelli.

**Eyes:** large, neutral.

**Mouthparts:** contrasting rich yellow mandibles with dark tips; small yellow appendages.

**Thorax:** dark neutral brown with slight sheen; mesoscutum lightly granulated with short cross-striae; hairy but not obviously so; notaulices less than half-length; no median line; dark straw tegulae; long separated foveae; granulated hairless scutellum; shiny mesopleuron with longitudinal striae curving at top and bottom.

**Legs:** pale, bright yellow, with darker brown, glossy coxae.

**Wings:** clear; pale yellow hairs & veins; open radial cell.

**Gaster:** dark neutral-brown; glossy; translucent below; open-ended sheath, with one main segment; not punctate.



## **Synergus, Hartig 1840**

### **- some common factors**

LONG PRONOTUM

PRONOTAL CARINA PRESENT IN ALL SPECIES EXCEPT S. VARIABILIS

RADIAL CELL CLOSED - WITH THE EXCEPTION OF S. APICALIS & S. ROTUNDIVENTRIS

TERGITES 2-3 FUSED INTO ONE MAJOR SEGMENT

1st GASTRAL SEGMENT (PETIOLE) LONGITUDINALLY GROOVED

HEAD WIDENED BEHIND

FEMALE - ANTENNAL SEGMENTS 14

MALE - ANTENNAL SEGMENTS 15

DENSE, RADIATING FACIAL STRIAE





*Synergus albipes* Hartig 1841

♀ X 21

**Impression:** VARIABLE FROM DARK TO PALER BROWN; BLACK HEAD & THORAX; DARK GASTER FRINGED WITH CHESTNUT; BROWN & DIRTY-GOLD LEGS; YELLOW ANTENNAE. FOURTEEN antennal segments.

**Length:** Body **1.8mm** (1.1-2.9)

**Ratios:** Head+Thorax/Body 52%; Antenna/Body 74%; Wing/Body **113%**.

**Antennae:** yellow; globular pedicel and darker brown scape; long straight 3rd; slight taper.

**Head:** black; large brown ocelli.

**Eyes:** largish, neutral.

**Mouthparts:** small pale appendages; yellow mandibles.

**Thorax:** black with pale hairs; pronotal carina present; mesoscutum semi-shiny with cross rugulae; strong full-length notaulices; short median line; dark tegulae; small rugose scutellum; dull, separated foveae; shiny, longitudinally striate mesopleuron.

**Legs:** variable from much pale yellow to dark; tapering from dark coxae; dark dusted femora and tibiae, with gold joints; to pale yellow tarsi.

**Wings:** clear; very pale veins and hairs; closed radial cell.

**Gaster:** from near black to dark chestnut-brown, larger insects may tend towards a yellower brown; large, pale chestnut ploughshare; dull, oily gloss; not punctate.



♂ X 32

**Impression:** VARIABLE FROM DARK TO PALER BROWN; BLACK HEAD & THORAX; BLACK TO BROWN GASTER, FRINGED WITH CHESTNUT; DARK TO YELLOW LEGS; YELLOW ANTENNAE. FIFTEEN antennal segments.

**Length:** Body **1.5mm** (1.2-2.7)

**Ratios:** Head+Thorax/Body 55%; Antenna/Body 84%; Wing/Body **121%**.

**Antennae:** pale yellow; darker brown-yellow pedicel; slightly darker scape; steeply bent 3rd segment; slight taper.

**Head:** very dark neutral brown; with masses of short white hairs; small silvery-chestnut ocelli.

**Eyes:** largish, neutral.

**Mouthparts:** bright yellow mandibles; small yellow appendages.

**Thorax:** black with pale hairs; pronotal carina present; mesoscutum semi-shiny with transverse rugulae; median line half length or less; dark tegulae; small rugose scutellum; dull, separated foveae; shiny longitudinally striate mesopleuron; full-length notaulices.

**Legs:** variable from much pale yellow to dark; tapering from dark coxae; dark dusted femora and tibiae, with gold joints; to pale yellow tarsi.

**Wings:** clear; very pale hairs and veins; closed radial cell.

**Gaster:** chestnut-brown to dark; slender from above; dull, oily gloss; not punctate.



***Synergus apicalis*** Hartig 1841

♀ X 3

**Impression:** VARIABLE, FROM CHESTNUT TO BLACK HEAD; BLACK THORAX; DARK BROWN GASTER WITH PALE CHESTNUT EDGE; DEEP YELLOW-BROWN LEGS; DARK YELLOW-GREY ANTENNAE. FOURTEEN antennal segments.

**Length:** Body 1.9mm (1.4-2.7)

**Ratios:** Head + Thorax/Body 53%; Antenna/Body -%; Wing/Body 108%.

**Antennae:** all yellow, with outer segments slightly darker; fat, flask-shaped scape; long pedicel; tapered.

**Head:** black, with brown bleeding out from mouth; small straw-coloured ocelli.

**Eyes:** mid-size, dark brown.

**Mouthparts:** deep chestnut mandibles with black tips; dirty straw appendages.

**Thorax:** black; pronotal carina present; shining mesoscutum lightly sculpted transversely; three-quarter length notaulices, or less; no median line; pale chestnut tegulae; scutellum weakly rugulose; very shallow near-separated foveae; glossy, lightly striate translucent golden mesopleuron.

**Legs:** dark coxae & femora; brown-tinged yellow tibiae & yellow tarsi.

**Wings:** clear; large, pale veins and hairs; radial cell indistinctly closed.

**Gaster:** shining rich dark-brown, with darker band at back; no visible segments; band of adpressed hairs across top of apex; large pale ploughshare; not punctate.



♂ X 18

**Impression:** YELLOW TO RED-BROWN HEAD; BLACK THORAX; DARK BROWN GASTER; TESTACEOUS LEGS; CHESTNUT ANTENNAE. FIFTEEN antennal segments.

**Length:** Body 1.4mm (1.1-1.8)

**Ratios:** Head + Thorax/Body 57%; Antenna/Body 80%; Wing/Body 122%.

**Antennae:** all yellow; pedicel longer than wide; unusual 3<sup>rd</sup>, very like female with no enlargement and minimal excavation; tapering to slight club.

**Head:** rich yellow to red-brown, little sculpture, short pale hairs especially round mouth; small pale ocelli.

**Eyes:** dark brown, mid-sized.

**Mouthparts:** small yellow appendages; mandibles yellow with dark chestnut tips.

**Thorax:** dark brown, with paler chestnut sides; pronotal carina present; shiny mesoscutum with transverse rugulae; three-quarter length notaulices or less; no median line; dark tegulae; separate indistinct foveae; scutellum heavily sculpted; glossy translucent chestnut mesopleuron, lightly longitudinally striate, unobtrusive hairs.

**Legs:** clear yellow-testaceous, with darker, hairy coxae; back legs slightly darker.

**Wings:** clear; yellowish hairs & dark neutral veins; long thin wings; radial cell indistinctly closed.

**Gaster:** dark brown, glossy single main segment; not punctate.



*Synergus clandestinus* Eady 1952

♀ X 8

**Impression:** BLACK HEAD & THORAX; BLACK GASTER WITH CHESTNUT EDGING; DARK & PALER LEGS; GOLDEN & DARK ANTENNAE. FOURTEEN antennal segments.

**Length:** Body 2.2mm (1.7-2.5)

**Ratios:** Head+Thorax/Body 55%; Antenna/Body 70%; Wing/Body 111%.

**Antennae:** rich gold darkening towards tip; long scape, long pedicel; third segment slender; only slight taper.

**Head:** black, punctate, with fine microsculpture; semi-glossy.

**Eyes:** medium-sized, dark.

**Mouthparts:** gold mandibles with dark tips, gold appendages.

**Thorax:** black; pronotal carina present; mesoscutum with fine cross-marked microsculpture; full-length notaulices; no median line; glossy dark brown tegulae; scutellum rugose; glossy black separated foveae, with some sculpture; mesopleuron glossy middle with longitudinal striation top & bottom;.

**Legs:** dark brown coxae tapering down to dirty yellow tarsi, with yellow round joints.

**Wings:** clear; pale yellow veins and short brown hairs; closed radial cell.

**Gaster:** black, with chestnut edging at back and below; glossy; a single line of hairs towards base; long, thin spine with short, sparse hairs; clearly punctate.

♂ X 7

**Impression:** BLACK HEAD & THORAX; BLACK GASTER WITH CHESTNUT EDGING; DARK & PALER LEGS; GOLDEN & DARK ANTENNAE. FOURTEEN antennal segments.

**Length:** Body 1.9mm (1.6-2.4)

**Ratios:** Head+Thorax/Body 58%; Antenna/Body 85%; Wing/Body 118%.

**Antennae:** rich gold darkening towards tip; long scape, long pedicel; third segment little distorted but similar to that of a normal female *Synergus*; only slight taper.

**Head:** black, punctate, with fine microsculpture; semi-glossy.

**Eyes:** medium-sized, dark.

**Mouthparts:** gold mandibles with dark tips, gold appendages.

**Thorax:** black; pronotal carina present; mesoscutum with fine cross-marked microsculpture; full-length notaulices, no median line; tegulae glossy dark brown; scutellum rugose; glossy black separated foveae, with some sculpture; mesopleuron with glossy top & bottom and longitudinal striae over rest;.

**Legs:** dark brown coxae tapering down to dirty yellow tarsi, with yellow round joints.

**Wings:** clear; pale yellow veins and short brown hairs; closed radial cell.

**Gaster:** black, with chestnut edges at back and below; glossy; a single line of hairs towards base; clearly punctate.



*Synergus crassicornis (=evanescens)* (Curtis 1838)

♀ X 6

*Impression:* BLACK HEAD; DARK BROWN THORAX; DARK GASTER; BROWN LEGS & ANTENNAE.

**FOURTEEN** antennal segments.

*Length:* **Body 2.3mm** (1.9-2.8)

*Ratios:* Head + Thorax/Body 51%; Antenna/Body 72%; Wing/Body **101%**.

*Antennae:* brown.

*Head:* black; heavily sculpted and hairy.

*Eyes:* small & dark.

*Mouthparts:* dirty golden mandibles and appendages.

*Thorax:* very dark brown; pronotal carina present; mesoscutum with heavy transverse sculpture; three-quarter length notaulices; no median line; chestnut tegulae; hairy scutellum with heavy sculpture; mesopleuron with heavy longitudinal striation, not very obvious carina round sides and back.

*Legs:* mid-brown, with paler joints; hairy.

*Wings:* clear; golden veins and hairs; closed radial cell.

*Gaster:* dark; clearly punctate.



♂ X 6

*Impression:* BLACK HEAD; DARK BROWN THORAX; DARK CHESTNUT GASTER; GOLD LEGS; DARK GOLD ANTENNAE. FIFTEEN antennal segments.

*Length:* **Body 1.8mm** (1.1-2.2)

*Ratios:* Head + Thorax/Body 57%; Antenna/Body 88%; Wing/Body **117%**.

*Antennae:* dark gold, darkening towards tip; long pedicel & smallish scape; 3rd segment swollen and lightly bent; clavate; hairy.

*Head:* black; heavily sculpted and hairy.

*Eyes:* mid-size, dark.

*Mouthparts:* dirty golden mandibles and appendages.

*Thorax:* very dark brown; pronotal carina present; mesoscutum with heavy cross sculpture; three-quarter length notaulices; no median line; chestnut tegulae; scutellum with heavy sculpture and hairy; mesopleuron with heavy longitudinal striation prominent carina round sides and back.

*Legs:* hairy, golden-yellow, with slightly darker coxae.

*Wings:* clear; mid-brown veins and hairs; closed radial cell.

*Gaster:* dark chestnut, with pale front, above; one main segment, glossy; hairless except for very back; square back with projecting V; clearly punctate.



***Synergus gallaepomiformis*** (Boyer de Fonscolombe 1832)

♀ X 107 (both forms) - FORM A, 1st Summer

**Impression:** MAINLY DARK YELLOW-BROWN HEAD; BLACK THORAX; DARK BROWN GASTER; BROWN & YELLOW LEGS; ANTENNAE VARIABLE. FOURTEEN antennal segments.

**Length:** Body **2.3mm** (1.4-2.9)

**Ratios:** Head+Thorax/Body 55%; Antenna/Body 82%; Wing/Body **108%**.

**Antennae:** deep yellow throughout; pedicel short; 3rd straight.

**Head:** dark yellow to brown, always with brown vertex; leathery top and frons; small chestnut ocelli.

**Eyes:** large; brown, edged with yellow.

**Mouthparts:** mandibles deep gold, with dark tips. appendages pale.

**Thorax:** black; pronotal carina present; mesoscutum dull with cross-rugulae; full-length notaulices; three-quarter length median line; straw-coloured tegulae; scutellum dull, with whorls of strong rugulae; separate but indistinct foveae; shiny mesopleuron with longitudinal striae.

**Legs:** yellow-brown, with dark high-gloss coxae and browner femora.

**Wings:** clear; hairy with pale yellow veins; closed radial cell.

**Gaster:** dark brown, tapering down to yellow/brown; not punctate.



♂ X 149 (both forms)

**Impression:** MAINLY YELLOW HEAD; BLACK THORAX; DARK BROWN GASTER; BROWN & YELLOW LEGS; ANTENNAE VARIABLE. FIFTEEN antennal segments.

**Length:** Body **1.8 mm** (1.1-2.4)

**Ratios:** Head+Thorax/Body 55%; Antenna/Body 87%; Wing/Body **114%**.

**Antennae:** deep yellow throughout; pedicel short; 3rd bent; light taper.

**Head:** rich, deep yellow, with brown vertex; strong contrast with dark eyes; small chestnut ocelli.

**Eyes:** dark; mid-sized.

**Mouthparts:** mandibles deep gold with dark tips; appendages pale.

**Thorax:** black; pronotal carina present; mesoscutum dull with cross-rugulae; full-length notaulices; three-quarter length median line; straw-coloured tegulae; scutellum dull, with whorls of strong rugulae; separate but indistinct foveae; shiny mesopleuron with longitudinal striae.

**Legs:** brown and yellow. darker, high-gloss rear coxae, with some brown on front ones, otherwise largely rich, deep yellow, shading into rich brown.

**Wings:** transparent but with mid-grey/brown hairs and pale yellowy veins; closed radial cell.

**Gaster:** dark brown, with paler beneath; glossy; not punctate.



***Synergus gallaepomiformis***

♀ X 107 (both forms) - FORM B, 2nd spring.

**Impression:** DARK HEAD; BLACK THORAX; DARK BROWN GASTER; BROWN & YELLOW LEGS; YELLOW ANTENNAE. FOURTEEN antennal segments.

**Length:** Body 2.3 mm (1.1-2.4)

**Ratios:** Head + Thorax/Body 55%; Antenna/Body 82%; Wing/Body 108%.

**Antennae:** variable, from deep yellow throughout to dark, with more or less yellow on scape ; pedicel short; 3rd bent; light taper.

**Head:** dark; small chestnut ocelli.

**Eyes:** dark; mid-sized.

**Mouthparts:** mandibles deep gold with dark tips; appendages pale.

**Thorax:** black; pronotal carina present; mesoscutum dull with cross-rugulae; full-length notaulices; three-quarter length median line; straw-coloured tegulae; scutellum dull, with whorls of strong rugulae; separate but indistinct foveae; shiny mesopleuron with longitudinal striae.

**Legs:** brown and yellow. darker, high-gloss rear coxae, with some brown on front ones, otherwise largely rich, deep yellow, shading into rich brown.

**Wings:** clear; mid-grey/brown hairs and pale yellow veins; closed radial cell.

**Gaster:** dark brown, with paler beneath; glossy; not punctate.



♂ X 149 (both forms)

**Impression:** DARK HEAD; BLACK THORAX; DARK BROWN GASTER; BROWN & YELLOW LEGS; YELLOW ANTENNAE. FIFTEEN antennal segments.

**Length:** Body 1.8 mm (1.1-2.4)

**Ratios:** Head + Thorax/Body 55%; Antenna/Body 87%; Wing/Body 114%.

**Antennae:** deep yellow throughout; pedicel short; 3rd bent; light taper;.

**head:** dark; small chestnut ocelli.

**eyes:** dark; mid-sized.

**mouthparts:** mandibles deep gold with dark tips; appendages pale.

**thorax:** black; pronotal carina present; mesoscutum dull with cross-rugulae; full-length notaulices; three-quarter length median line; straw-coloured tegulae; scutellum dull, with whorls of strong rugulae; separate but indistinct foveae; shiny mesopleuron with longitudinal striae.

**legs:** brown and yellow. darker, high-gloss rear coxae, with some brown on front ones, otherwise largely rich, deep yellow, shading into rich brown.

**wings:** clear; mid-grey/brown hairs and pale yellow veins; closed radial cell.

**gaster:** dark brown, with paler beneath; glossy; not punctate.



***Synergus incrassatus*** Hartig 1840

♀ X 10

**Impression:** GOLD OR DIRTY-BROWN HEAD; BROWN-BLACK THORAX; CHESTNUT GASTER; GOLD LEGS & ANTENNAE. FOURTEEN antennal segments.

**Length:** Body **2.8mm** (1.9-3.9)

**Ratios:** Head+Thorax/Body 51%; Antenna/Body 66%; Wing/Body **97%**.

**Antennae:** dark gold; hairy; globular pedicel; long, slender 3rd; slightly tapering.

**Head:** dirty-brown or gold, with sharply-fanned facial carinae; dark brown frons with lighter edges to eyes; pale chestnut ocelli.

**Eyes:** dark & fairly small.

**Mouthparts:** golden-brown mandibles.

**Thorax:** brown-black; shiny; pronotal carina present; mesoscutum hairy, with transverse carinae; full-length notaulices; thin median line; tegulae translucent gold; scutellum with tight rugulose sculpture; no foveae; lightly longitudinally-lined mesopleuron.

**Legs:** deep dark gold with darker brown tibiae and coxae; golden markings round joints; hairy;.

**Wings:** clear; very pale to translucent veins and hairs; closed radial cell.

**Gaster:** glossy; translucent chestnut, without a fringe of long hairs beneath; not punctate.



♂ X 8

**Impression:** DARK GOLD HEAD; BLACK THORAX; CHESTNUT GASTER; GOLD LEGS & ANTENNAE. FIFTEEN antennal segments.

**Length:** Body **2.3mm** (1.8-3.0)

**Ratios:** Head+Thorax/Body 57%; Antenna/Body 72%; Wing/Body **103%**.

**Antennae:** all golden-yellow; globular pedicel; fat, flask-shaped scape; large 3rd sharply flanged at top.

**Head:** medium-sized, brown or gold, with sharply-fanned facial carinae; dark brown frons with lighter edges to eyes; dark chestnut ocelli.

**Eyes:** medium dark, contrasting with paler head.

**Mouthparts:** golden-brown mandibles.

**Thorax:** black; pronotal carina present; mesoscutum hairy, shiny, with transverse rugulae on top; full-length notaulices; half length median line; gold tegulae; rugose scutellum; no foveae; mesopleuron shiny and lightly longitudinally lined.

**Legs:** golden with traces of chestnut-brown on tibiae, and darker coxae.

**Wings:** clear; translucent veins and hairs; closed radial cell.

**Gaster:** shiny, translucent chestnut to dark brown; not punctate.



***Synergus nervosus*** Hartig 1840

♀ X 11

**Impression:** RICH YELLOW-BROWN, TO ALL DARK, BODY; YELLOW-BROWN LEGS; VARIABLE PALE YELLOW TO BROWN ANTENNAE. FOURTEEN antennal segments.

**Length:** Body 1.9mm (1.6-2.4)

**Ratios:** Head + Thorax/Body 52%; Antenna/Body 73%; Wing/Body 112%.

**Antennae:** variable from all pale yellow to dark neutral brown; long, thin 3<sup>rd</sup>; slight taper.

**Head:** yellow-brown to black, with fanned facial carinae.

**Eyes:** brown, mid-sized.

**Mouthparts:** appendages and mandibles yellow.

**Thorax:** rich yellow-brown to black; hairy and granulated; pronotal carina present; semi-glossy, lightly sculpted mesoscutum; full-length notaulices; median line half length or less; tegulae yellow-brown; scutellum heavily rugulose; semi-glossy, dull, separated foveae; lightly sculpted mesopleuron.

**Legs:** deep, rich yellow.

**Wings:** clear; mid-length; pale veins and hairs; closed radial cell.

**Gaster:** rich yellow-brown to dark, with darker brown rear end; high gloss; not punctate – except for some characteristic minute ones at apex.



♂ X 11

**Impression:** BLACK HEAD & THORAX; DARK GASTER; DARK & GOLD LEGS; ANTENNAE VARIABLE FROM GOLDEN TO BROWN. FIFTEEN antennal segments.

**Length:** Body 1.7mm (1.3-1.9)

**Ratios:** Head + Thorax/Body 57%; Antenna/Body 84%; Wing/Body 119%.

**Antennae:** variable from bright gold to dark neutral brown; scape brown & gold; pedicel long & then wide; 3<sup>rd</sup> segment long and straight; slender & tapering; gently curled.

**Head:** large, black, fading into bright brown round mouth, granular; fanned facial carinae; small straw-coloured ocelli.

**Eyes:** dark & medium-sized.

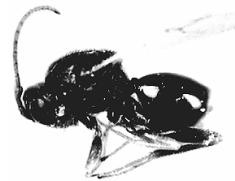
**Mouthparts:** pale and small.

**Thorax:** black; pronotal carina present; mesoscutum semi-shiny with cross-rugulae; full-length notaulices; median line half length or less; dark tegulae; scutellum small with rugose sculpture; dull, separated foveae; mesopleuron glossy with faint longitudinal striae.

**Legs:** dark brown coxae, femora and tibiae, with more or less gold by joints and on tarsi.

**Wings:** clear; pale veins and hairs; closed radial cell.

**Gaster:** dark with chestnut tint; glossy; not punctate - except for some characteristic minute ones at apex.





*Synergus pallicornis* Hartig 1841

♀ X 6

**Impression:** DARK OR UNIFORMLY YELLOW-BROWN HEAD & THORAX; CHESTNUT GASTER; YELLOW LEGS & ANTENNAE. FOURTEEN antennal segments.

**Length:** Body **2.3mm** (1.6-2.6)

**Ratios:** Head+Thorax/Body 54%; Antenna/Body 74%; Wing/Body **109%**.

**Antennae:** yellow, with curled tips; pedicel longer than broad; 3rd segment nearly twice as long as 4th; long; hairy.

**Head:** dark or yellow-brown and finely granular, with white hairs; pale chestnut ocelli.

**Eyes:** dark, neutral brown; medium-large.

**Mouthparts:** mid-brown mandibles, with pale appendages.

**Thorax:** dark or yellow-brown; pronotal carina present; shiny mesoscutum with pale hairs and strong cross striae; full-length notaulices; two-thirds length median line; rich brown tegulae; hairy granular scutellum; no obvious foveae; shiny, shiny mesopleuron with longitudinal curved folds above and below.

**Legs:** glossy chestnut/brown coxae, remainder rich yellow/brown.

**Wings:** clear; transparent veins and hairs; closed radial cell.

**Gaster:** high-gloss chestnut; rounded, with angled keel, streamlined appearance; longish petiole; not punctate in sense of key, although there are some minute punctuations on end of main segment.

♂ X 3

**Impression:** HEAD & THORAX VARY FROM BLACK TO YELLOW-BROWN; GASTER BROWN EDGED WITH CHESTNUT; YELLOW LEGS & ANTENNAE. FIFTEEN antennal segments.

**Length:** Body **1.6mm**

**Ratios:** Head+Thorax/Body 54%; Antenna/Body 73%; Wing/Body **108%**.

**Antennae:** pale dull yellow; short, solid, sharply curved 3rd.

**Head:** dull yellow-brown, with pale hairs; pale chestnut ocelli.

**Eyes:** dark brown, medium-sized.

**Mouthparts:** yellow mandibles, darkening slightly at tip; pale yellow appendages.

**Thorax:** from black to dull yellow-brown; pronotal carina present shiny mesoscutum with pale hairs and strong cross striae; complete notaulices; mid-length median line; rich brown tegulae; no obvious foveae; hairy granular scutellum; shiny mesopleuron; with longitudinal curved folds above and below.

**Legs:** pale dirty yellow, with some chestnut on coxae.

**Wings:** clear; very pale hairs and veins; pointed; closed radial cell.

**Gaster:** pale brown with chestnut tinges; pointed, slender and notic segment 2/3, though present as minute punctures on others.



A103

*-Robin Williams-*



***Synergus pallidipennis*** Mayr 1872

♀ X 18

**Impression:** BLACK HEAD & THORAX; DARK CHESTNUT GASTER; DARK & GOLD/BROWN LEGS; RICH GOLDEN-BROWN ANTENNAE. FOURTEEN antennal segments.

**Length:** Body 2.7mm (2.1-3.8)

**Ratios:** Head + Thorax/Body 52%; Antenna/Body 75%; Wing/Body 98%.

**Antennae:** rich golden/brown; pedicel longer than broad; long straight 3rd; not tapered.

**Head:** black, rugose sculpture; sharply-defined golden-yellow mouth; facial carinae swept like fan, but none prominent, as in *S. reinhardi*.

**Eyes:** small; rich golden-brown

**Mouthparts:** rich brown mandibles; pale appendages.

**Thorax:** black; pronotal carina present; mesoscutum heavily rugose; full-length notaulices; three-quarter length median line; tegulae mid-brown; scutellum heavily rugose; wide, shallow but separated foveae, with longitudinal striae; shiny mesopleuron with longitudinal striae.

**Legs:** rich brown coxa and femur, with paler joints; tapering to golden brown; pale tarsi and claws (not yellow).

**Wings:** clear; pale gold veins, pale yellow hairs; closed radial cell.

**Gaster:** dark chestnut-brown, paler beneath; glossy; clearly punctate.



♂ X 2

**Impression:** BLACK HEAD & THORAX; BROWN-BLACK GASTER; DARK & GOLD-BROWN LEGS; RICH GOLD ANTENNAE. FIFTEEN antennal segments.

**Length:** Body 3.0mm

**Ratios:** Head + Thorax/Body 56%; Antenna/Body 89%; Wing/Body 103%.

**Antennae:** all gold with darker top; pedicel long; scape fat with darker base; 3rd lightly expanded and fat.

**Head:** black; smaller, rounded; granulated; fanned facial carinae.

**Eyes:** large, golden.

**Mouthparts:** rich brown tips to mid-brown, neutral mandibles, giving impression of mostly dark head.

**Thorax:** black and granular; pronotal carina present; strong full-length notaulices; full-length median line; mesopleuron with longitudinal striae.

**Legs:** dark brown coxae, fibulae and tibiae; tarsi and joints deep gold.

**Wings:** clear; dark veins; pale hairs; closed radial cell.

**Gaster:** deep rich brown/black, with slight paling at rear; square and solid but small; shiny; clearly punctate.



***Synergus reinhardi*** Mayr 1872

♀ X 106

**Impression:** BLACK HEAD & THORAX; CHESTNUT-EDGED BLACK GASTER; LEGS MAINLY DARK, WITH YELLOW; YELLOW-BROWN ANTENNAE. FOURTEEN antennal segments.

**Length:** Body 3.5mm (1.9-4.5)

**Ratios:** Head+Thorax/Body 47%; Antenna/Body 77%; Wing/Body 95%.

**Antennae:** pale brown darkening to mid neutral-brown; chestnut edging to segments; dark first half of scape; long pedicel; gently-curved 3rd.

**Head:** black, granular, with clear definition of edge of mouth; large close-set brown ocelli.

**Eyes:** mid-size, dark brown.

**Mouthparts:** gold mandibles with dark tips; paler appendages.

**Thorax:** black; pronotal carina present; heavy cross striae on mesoscutum; thin full-length notaulices; full length median line; black tegulae; granular scutellum; indistinct separated foveae; shiny mesopleuron, with longitudinal striae.

**Legs:** generally dark appearance; dark brown femora and coxae, dirty yellow tibiae and tarsi, contrasting yellow/brown joints.

**Wings:** clear; heavy dark brown veins; pale hairs; closed radial cell.

**Gaster:** bulky, dark black/brown, with chestnut tints beneath and to rear; clearly punctate.



♂ X 110

**Impression:** BLACK HEAD & THORAX; CHESTNUT-EDGED BLACK GASTER; LEGS MAINLY DARK, WITH YELLOW; YELLOW-BROWN ANTENNAE. FIFTEEN antennal segments.

**Length:** Body 2.9mm (1.8-3.9)

**Ratios:** Head+Thorax/Body 56%; Antenna/Body 86%; Wing/Body 102%.

**Antennae:** pale brown darkening after a few segments to dark-neutral; slight chestnut tint on segment ends; dark scape; long pedicel; slender, lightly bent 3<sup>rd</sup>.

**Head:** black; granular; clear-cut pale mouth; large close-set brown ocelli.

**Eyes:** mid-brown, mid-size.

**Mouthparts:** gold mandibles with dark tips; appendages small and pale yellow.

**Thorax:** black; pronotal carina present; mesoscutum with heavy cross-striae; full-length notaulices; full-length median line; black tegulae; scutellum granular and hairy; indistinct separate foveae; shiny mesopleuron with longitudinal striae.

**Legs:** very dark coxae fibulae and tibiae, with contrasting yellow joints; some brown on first tarsal joint.

**Wings:** clear; prominent rich, dark brown veins, pale hairs; closed radial cell.

**Gaster:** dark brown with paler band beneath; clearly punctate.



*Synergus rotundiventris* Mayr 1872

♀ X 5

**Impression:** BLACK HEAD; DARK NEUTRAL BROWN THORAX; DARK BROWN GASTER; BROWN LEGS; MID-BROWN ANTENNAE. FOURTEEN antennal segments.

**Length:** Body 1.8mm (1.6-2.0)

**Ratios:** Head + Thorax/Body 58%; Antenna/Body 69%; Wing/Body 113%.

**Antennae:** uniformly brown with dark hairs; globular pedicel; straight 3rd; not tapered.

**Head:** black; granulated; neutral hairs.

**Eyes:** largish, neutral.

**Mouthparts:** bright yellow mandibles; small pale yellow appendages.

**Thorax:** dark neutral brown, quite heavily sculpted; lots of shortish neutral hairs; pronotal carina present; weak notaulices, sometimes absent at the front; almost no median line.

**Legs:** tapered from dark brown to paler brown.

**Wings:** clear; strong yellow veins and hairs; radial cell indistinctly closed.

**Gaster:** dark brown; glossy, with some strong hairs on side; single main segment, hairy around rear end; not punctate.

♂ X 4

**Impression:** BLACK HEAD; DARK NEUTRAL BROWN THORAX; DARK BROWN GASTER; YELLOW-BROWN LEGS & ANTENNAE. FIFTEEN antennal segments.

**Length:** Body 1.7mm (1.4-1.9)

**Ratios:** Head + Thorax/Body 62%; Antenna/Body 83%; Wing/Body 113%.

**Antennae:** uniformly brownish-yellow, with dark hairs; normal pedicel and scape; large, bent 3rd; not tapered.

**Head:** face black, with granulations and neutral hairs..

**Eyes:** largish, neutral.

**Mouthparts:** bright yellow mandibles; small pale yellow appendages.

**Thorax:** dark neutral-brown, quite heavily sculpted; lots of shortish neutral hairs; pronotal carina present; weak notaulices, sometimes absent at front; almost no median line.

**Legs:** tapered from dark brown to yellow-brown.

**Wings:** clear; strong yellow veins & hairs; radial cell indistinctly closed.

**Gaster:** dark brown; glossy, with some strong hairs on side; single main segment; hairy round rear end; not punctate.



***Synergus ruficornis*** Hartig 1840

♀ X 5

**Impression:** BLACK HEAD & THORAX; DARK BROWN GASTER; YELLOW LEGS & ANTENNAE. FOURTEEN antennal segments.

**Length:** Body **2.0mm** (1.8-2.6)

**Ratios:** Head+Thorax/Body 49%; Antenna/Body 74%; Wing/Body **119%**.

**Antennae:** dirty yellow with darker end segments, pedicel long; scape fat; 3rd segment long & thin; short hairs; slightly tapered.

**Head:** black, hairy; reticulate.

**Eyes:** dark, large.

**Mouthparts:** chestnut & yellow mandibles; yellow appendages.

**Thorax:** black; pronotal carina present; mesoscutum hairy, with heavy transverse rugulae in centre; full-length notaulices; three-quarter length median line; heavily sculpted, hairy scutellum; short shiny mesopleuron with longitudinal striae.

**Legs:** dark coxae and part femora, pale joints, hairs; the rest dark yellow including claws.

**Wings:** clear; pale hairs and veins; closed radial cell.

**Gaster:** dark brown, bulky and pointed, with pale edges at rear; single main segment; small ploughshare beneath; weakly but clearly punctate.

♂ X 5

**Impression:** BLACK HEAD & THORAX; DARK BROWN GASTER; YELLOW LEGS & ANTENNAE. FIFTEEN antennal segments.

**Length:** Body **2.2mm** (1.8-3.0)

**Ratios:** Head+Thorax/Body 56%; Antenna/Body 81%; Wing/Body **103%**.

**Antennae:** dirty yellow, darker stout scape, long pedicel; 3rd segment long, with slight excavation; hairy, not tapered.

**Head:** black; reticulated; hairy.

**Eyes:** mid-size, dark.

**Mouthparts:** pale appendages, darker brown mandibles.

**Thorax:** black; pronotal carina present; mesoscutum heavily sculpted, with rugulae running across the centre, hairy; full-length notaulices; three-quarter length median line; scutellum heavily sculpted, hairy; mesopleuron shiny with many longitudinal striae.

**Legs:** dark coxae, the rest deep, golden yellow, with dark claws; short hairs all over.

**Wings:** clear; pale hairs and veins; closed radial cell.

**Gaster:** dark brown, some paler edges at back; hairless; heavy; pointed; single main segment; weakly but clearly punctate.



***Synergus thaumacerus*** (Dalman 1923)

♀ X 5

**Impression:** HEAD VARIES FROM YELLOW TO CHESTNUT OR BLACK; DARK NEUTRAL BROWN THORAX; BROWN & CHESTNUT GASTER; YELLOW LEGS & ANTENNAE. FOURTEEN antennal segments.

**Length:** Body 2.3mm (2.3-2.4)

**Ratios:** Head + Thorax/Body 52%; Antenna/Body 77%; Wing/Body 112%.

**Antennae:** yellow-brown; fat, part-dark scape; thin and comparatively short 3rd; hairy; slight taper.

**Head:** yellow to red or black; masses of brushed pale hairs wide;.

**Eyes:** medium-sized, neutral.

**Mouthparts:** deep, rich yellow mandibles; pale yellow appendages.

**Thorax:** dark neutral-brown, lightly granulated; masses of light hairs; pronotal carina present; mesoscutum with fine transverse rugulae; strong full-length notaulices; half-length median line; tegulae dark brown; scutellum with transverse rugulae and pale hairs; mesopleuron heavily longitudinally striate.

**Legs:** yellow, with dark coxae and femora.

**Wings:** clear; yellow hairs and veins; closed radial cell.

**Gaster:** glossy brown, with touch of chestnut; single main segment; deep ploughshare beneath; not punctate.

♂ X 1

**Impression:** YELLOW HEAD, LEGS & ANTENNAE; BLACK THORAX; BROWN GASTER. FIFTEEN antennal segments.

**Length:** Body 1.5mm

**Ratios:** Head + Thorax/Body 55%; Antenna/Body 77%; Wing/Body 114%.

**Antennae:** all pale yellow; pedicel long, scape small; 3rd segment grossly enlarged and flattened; slightly hairy; not tapered.

**Head:** yellow; heavily but finely sculpted; pale hairs.

**Eyes:** dark, medium-sized.

**Mouthparts:** pale yellow appendages; mandibles yellow with dark brown tips.

**Thorax:** all black; hairy pronotal carina present; mesoscutum heavily cross-sculpted with rugulae; full-length notaulices; three-quarter length median line; scutellum with heavy cross sculpture and many hairs; mesopleuron hairless, semi-shiny with longitudinal striae.

**Legs:** yellow all over; hairy.

**Wings:** clear; pale hairs and veins; closed radial cell.

**Gaster:** mid-brown with paler end; glossy; one main segment; not punctate.



***Synergus umbraculus*** (Olivier 1791)

♀ X 49

**Impression:** HEAD DARKER OR LIGHTER BROWN; BLACK THORAX; DARK BROWN GASTER; BROWN LEGS WITH PALE MARKINGS; MID-BROWN ANTENNAE. FOURTEEN antennal segments.

**Length:** Body 2.5mm (1.3-3.4)

**Ratios:** Head+Thorax/Body 52%; Antenna/Body 81%; Wing/Body 104%.

**Antennae:** mid-brown; dark scape, short, spherical pedicel; ratio % for segments  $\frac{3}{4}$  = 1.1 to 1.2X.; 3rd tapered, slender; antennae not tapered,

**Head:** black-brown vertex, fading to more or less brown, some darker than others; having brown only round the edges of the mouth – but never yellow.

**Eyes:** large and dark.

**Mouthparts:** yellow/gold appendages blend into head-colour, mandibles yellow-brown with strong dark chestnut jaws.

**Thorax:** all black, with pale hairs; pronotal carina present; mesoscutum rugose & broadly cross-striated; notaulices deep and full-length; wide three-quarter length median line; tegulae mid-brown; heavily rugose scutellum; separated, rugose foveae; mesopleuron glossy with heavy longitudinal striae.

**Legs:** brown, gradually becoming paler towards tarsi with paler joints.

**Wings:** clear; neutral brown veins and inconspicuous pale hairs; closed radial cell.

**Gaster:** dark-brown and glossy, with large pale ploughshare beneath; one main segment; clearly punctate.



♂ X 55

**Impression:** HEAD VARIABLE, FROM PALER TO DARKER YELLOW; BLACK THORAX; DARK BROWN GASTER; YELLOW OR DARKER LEGS & ANTENNAE. FIFTEEN antennal segments.

**Length:** Body 2.2mm (1.3-3.5)

**Ratios:** Head+Thorax/Body 55%; Antenna/Body 86%; Wing/Body 110%.

**Antennae:** normally all translucent gold, but sometimes darker and with somewhat darker scape; 3<sup>rd</sup> segment bent with heavily expanded outer end, segment 3/4 = 1.2x

**Head:** often bright yellow, with black vertex and contrasting eyes, but some are much closer to female, with the dark vertex blending into brown and maybe only showing around the mouth.

**Eyes:** large, dark.

**Mouthparts:** gold appendages and gold mandibles with heavy dark chestnut jaws.

**Thorax:** all black, with pale hairs; pronotal carina present; mesoscutum rugose & broadly cross-striated; notaulices deep and full-length; median line full-length; tegulae mid-brown; heavily rugose scutellum; separated, rugose foveae; mesopleuron glossy with heavy longitudinal striae.

**Legs:** yellow-headed insects have first two pairs of legs translucent gold; the rear pair are brown with paler tarsi; leg colour darkens with the colour of face.

**Wings:** clear; pale brown basal half of veins, pale hairs; closed radial cell.

**Gaster:** dark brown with translucent pale rear edge; one main segment; clearly punctate.



*Synergus variabilis* Mayr 1872

♀ X 22

**Impression:** DARK CHESTNUT HEAD & PRONOTUM; BLACK THORAX; GASTER CHESTNUT-TINGED BLACK; TESTACEOUS-YELLOW LEGS & ANTENNAE; FOURTEEN antennal segments.

**Length:** Body 1.7mm (1.3-2.2)

**Ratios:** Head + Thorax/Body 53%; Antenna/Body 67%; Wing/Body 105%.

**Antennae:** all testaceous-yellow; the pedicel twice as long as broad; long third segment; not tapered.

**Head:** Dark chestnut fading to paler round mouth, with black vertex; striae radiating from mouth to eyes; the rest alutaceous; mid-brown translucent ocelli .

**Eyes:** large and dark, contrasting with head.

**Mouthparts:** Mandibles straw tipped with black; straw-coloured appendages.

**Thorax:** Black; except for dark chestnut contrasting pronotum without pronotal carina; mesoscutum with interrupted transverse carinae, more or less smooth between, hairy; notaulices variable, from steeply impressed short triangle to only faintly indicated longer line, or more definite; from no median line to short triangular depression which may be slenderly lengthened to near half; tegulae translucent pale brown; rugose scutellum; glossy separated foveae; mesopleuron with light transverse striae;

**Legs:** Rear and sometimes mid-coxae dark brown; the remainder of legs testaceous-yellow, except for dark claws.

**Wings:** Clear; light yellow veins; closed radial cell.

**Gaster:** Very dark chestnut-tinged black; single main segment; no puncturations on main segment, though present on hypopygium; smooth & hairless, though not high gloss; short broad visible ventral spine.



♂ X 23

**Impression:** LIGHTER TO DARKER; TESTACEOUS-YELLOW HEAD & PRONOTUM; BLACK THORAX; GASTER CHESTNUT-TINGED BLACK; TESTACEOUS-YELLOW LEGS & ANTENNAE; FIFTEEN antennal segments.

**Length:** Body 1.6mm (1.0-2.1)

**Ratios:** Head + Thorax/Body 58%; Antenna/Body 74%; Wing/Body 107%.

**Antennae:** all yellow; pedicel longer than broad; third segment with excavated inner margin & up to 2X length of following next segment.

**Head:** Dark testaceous-yellow fading to paler round mouth, larger specimens with dark chestnut traces; black vertex; striae radiating from mouth to eyes; the rest alutaceous; mid-brown translucent ocelli.

**Eyes:** large and dark, contrasting with head.

**Mouthparts:** Mandibles straw tipped with black; straw-coloured appendages.

**Thorax:** Black; pronotum without pronotal carina; mesoscutum with interrupted transverse carinae, more or less smooth between, hairy; very variable notaulices from a long faint indentation on cuticle to more sharply-defined short triangle; from no median line to very short triangular depression; tegulae light brown to yellow; glossy separated foveae; rugose scutellum; mesopleuron with light transverse striae.

**Legs:** Rear coxae dark neutral; the remainder of legs pale translucent straw, except for dark claws.

**Wings:** Clear; light yellow veins; closed radial cell.

**Gaster:** Very dark chestnut-tinged black; single main segment; no puncturations.





# Descriptions - Parasitoids in oak-galls

FAMILY	PAGE
Eurytomidae	A112
Torymidae	A117
Ormyridae	A133
Pteromalidae	A136
Eupelmidae	A153
Eulophidae	A157
Ichneumonidae	A169
Diapriidae	A174



## Common factors for Eurytomidae in this section

NON-METALLIC - BLACK OR YELLOW

FIVE TARSAL SEGMENTS

ONE RING + FIVE OR LESS FUNICULAR SEGMENTS

LARGE PRONOTUM

NOTAULICES COMPLETE & DEEP

SHORT STIGMAL & POST-MARGINAL VEINS

PEDUNCULATE

OVIPOSITOR SHEATHS VERY SHORT OR NOT VISIBLE



♀

typical shapes (not to scale)



♂



***Eurytoma brunniventris*** Ratzeburg 1852 - EURYTOMIDAE

♀ X 27

**Impression:** BLACK NON-METALLIC BODY, SUPERFICIALLY SIMILAR TO SYNERGUS; DARK LEGS & ANTENNAE; OVIPOSITOR SHEATHS NOT VISIBLE. ONE ring, FIVE funicular & FIVE tarsal segments.

**Length:** Body **2.8mm** (1.4-3.4)

**Ratios:** Head + Thorax/Body 47%; Flagellum/Head + Thorax 64%; Wing/Body **79%**; Ovip/Body **0%**.

**Antennae:** 11(1r)53. grey-brown with short hairs ; quite heavy, tapering slightly; shortish.

**Head:** black with white hairs, granular; red ocelli.

**Eyes:** red-brown.

**Mouthparts:** dark yellow-brown appendages and mandibles.

**Thorax:** black; coarsely punctate, with short, white, angled hairs; long square pronotum; mesoscutum reticulate-punctate; deep full-length notaulices; black tegulae; scutellum reticulate-punctate; single narrow, deep fovea.

**Legs:** dark black-brown, with pale tarsi and contrasting joints.

**Wings:** clear; mid to pale grey-brown hairs and dark brown, deep-pigmented stigma and veins; well-developed stigma; no dark shadows.

**Gaster:** black; shiny; very like a *Synergus* in shape and appearance.

**Ovipositor sheaths:** beneath the gaster, largely hidden in last segment; not measurable.

♂ X 18

**Impression:** BLACK NON-METALLIC BODY & LEGS; DARK LEGS; KNOBBLY, WHORLED DARK ANTENNAE; STRONGLY PETIOLATE. ONE ring, FIVE funicular & FIVE tarsal segments.

**Length:** Body **1.9mm** (1.5-2.8)

**Ratios:** Head + Thorax/Body 62%; Fl/Head + Thorax 88%; Wings/Body **95%**.

**Antennae:** 11(1r)53. funicle segments knobbed, black, with whorls of long white hairs ringing each segment.

**Head:** black, coarsely reticulate-punctate; shortish white hairs all over; red ocelli.

**Eyes:** bright red, moderate sized.

**Mouthparts:** paler yellow-brown mandibles and small appendages.

**Thorax:** black, hairy & coarsely punctate; large quadrate pronotum; mesoscutum coarsely reticulate-punctate; deep full-length notaulices; black tegulae; scutellum coarsely reticulate-punctate single, narrow, deep fovea.

**Legs:** black, hairy, with contrasting joints and tarsi.

**Wings:** clear; Mid-brown hair; strong, mid-brown veins; well-developed stigma; some oily colouration.

**Gaster:** black; thin from above; very short and quadrate; joined to thorax low down by long slender petiole as long as remainder.



***Sycophila biguttata*** (Swederus 1795) - EURYTOMIDAE

♀ X 22

**Impression:** NON-METALLIC, WITH OR WITHOUT VARIABLE PALE MARKINGS; NORMALLY BLACK HEAD & THORAX; DARK BROWN GASTER; DARK & PALER LEGS; DARK ANTENNAE; CLOUDED WING; PETIOLATE. ONE ring, FIVE funicular & FIVE tarsal segments.

**Length:** Body 3.4mm (1.9-4.3)

**Ratios:** Head+Thorax/Body 51%; Flagellum/Head+Thorax 44%; Wings/Body 83%; Ovip/Body 0%.

**Antennae:** 11(1r)53. mid-brown, with longish, swollen, dark pedicel and very long scape; longitudinal sensillae; unequal in length; slight taper to inconspicuous club.

**Head:** black, sometimes with paler area round eyes and towards mouthparts; deep glossy indented vertex; the rest reticulate; black ocelli.

**Eyes:** smallish, red, with dark brown internal net marks.

**Mouthparts:** small yellow to mid-brown appendages and mandibles.

**Thorax:** black; but may be some inconspicuous pale areas; mesoscutum punctate-reticulate; notaulices very faint but full-length; dark tegulae; scutellum punctate-reticulate; mesepimeron with light longitudinal striae.

**Legs:** black coxae & most femora; tibiae with more or less dark; tarsi pale chestnut; pale joints.

**Wings:** transparent with conspicuous dark rectangular fascia, bent in the middle, running over stigmal vein.

**Gaster:** very dark brown and glossy, without sculpturing; petiolate.

**Ovipositor sheaths:** hardly protrude from beneath; not properly measurable.

♂ X 3

**Impression:** DARK NON-METALLIC BODY; LONG, DARK LEGS & ANTENNAE; DARK CLOUD AT STIGMA. ONE ring, FOUR funicular & FIVE tarsal segments.

**Length:** Body 2.1mm (2.1-2.2)

**Ratios:** Head+Thorax/Body 52%; Fl/Head+Thorax 63%; Wing/Body 94%.

**Antennae:** 11(1r)43; mid-brown and hairy; long dark scape; longish, swollen pedicel; heavy club; longitudinal sensillae; unequal in length.

**Head:** black, with paler area round eyes and towards mouthparts, though not conspicuous; glossy with few hairs; sculptured.

**Eyes:** smallish, red-brown.

**Mouthparts:** pale yellow-brown mandibles, darker-tipped; small similar colour appendages.

**Thorax:** largely black, but some inconspicuous pale areas, hairy; mesoscutum heavily punctate-reticulate; notaulices deep and complete; mid-brown tegulae; scutellum punctate-reticulate; mesepimeron shiny with longitudinal striae.

**Legs:** black and glossy, with dirty yellow contrasting joints and tarsi.

**Wings:** transparent with conspicuous rectangular fascia, bent in the middle, running over stigma, which is fairly short.

**Gaster:** black, with traces of brown at front; glossy without sculpturing; small, short and blocky; petiolate.



***Sycophila flavicollis*** (Walker 1834) - EURYTOMIDAE

♀ X 6

**Impression:** NON-METALLIC; YELLOW HEAD & THORAX, WITH SOME BROWN; GASTER ORANGE, WITH DARK BROWN; BRIGHT YELLOW LEGS & ANTENNAE; NO VISIBLE OVIPOSITOR. ONE ring, 5 funicular & FIVE tarsal segments.

**Length:** Body **1.6mm** (1.4-1.8)

**Ratios:** Head+Thorax/Body 53%; Fl/Head+Thorax 39%; Wings/Body **91%**; Ovip/Body **0%**.

**Antennae:** 11(1r)53; bright yellow; unequal in length; lightly clubbed; smooth; pear-shaped pedicel.

**Head:** bright yellow, with spot of brown on vertex and behind neck.

**Eyes:** red.

**Mouthparts:** yellow appendages and mandibles.

**Thorax:** yellow, with a bit of brown at rear; mesoscutum lightly sculpted; notaulices deep & complete; no median line; brown tegulae; no foveae; lightly sculpted scutellum; mesepimeron smooth dirty yellow with brown below.

**Legs:** all bright yellow, with a few brown spots.

**Wings:** small cloud on front of wing, by stigmal vein, spreading to large, light cloud further into wing; broad long, broad stigma with prominent uncus; yellow veins and hairs.

**Gaster:** orange, with some brown on top; petiolate

**Ovipositor sheaths:** not visible.

♂ X 6

**Impression:** YELLOW NON-METALLIC HEAD & THORAX WITH SOME BROWN; YELLOW-BROWN GASTER: YELLOW LEGS & ANTENNAE; PETIOLATE. ONE ring, FOUR funicular & FIVE tarsal segments.

**Length:** Body **1.6mm** (1.3-2.0)

**Ratios:** Head+Thorax/Body 57%; Fl/Head+Thorax 48%; Wings/Body **91%**.

**Antennae:** 11(1r)43; yellow, unequal in length; hairy; lightly swollen, long club.

**Head:** yellow, with brown between eyes; yellow-brown ocelli.

**Eyes:** red.

**Mouthparts:** yellow appendages, with brown tips to yellow mandibles.

**Thorax:** brown top, with yellow sides and front; mesoscutum lightly sculpted; notaulices deep & complete; no median line; brown tegulae; no foveae; lightly sculpted scutellum; mesepimeron smooth dirty yellow with brown below.

**Legs:** all yellow.

**Wings:** small cloud on front of wing, by stigmal vein, spreading to large, light cloud further into wing; broad long, broad stigma with prominent uncus; yellow veins and hairs.

**Gaster:** long dark yellow petiole; main part glossy yellow/brown; petiolate.



***Sycophila variegata*** (Curtis 1831) - EURYTOMIDAE

♀ X 5

**Impression:** NON-METALLIC; BODY COLOUR VARIABLE FROM MOSTLY YELLOW TO AMOUNTS OF DARK BROWN; YELLOW & BROWN STRIPED LEGS; YELLOW-BROWN ANTENNAE; CLOUDED WINGS; PETIOLATE; OVIPOSITOR SHEATHS NOT MEASURABLE. ONE ring, FIVE funicular & FIVE tarsal segments.

**Length:** Body 1.9mm (1.6-2.7)

**Ratios:** Head+Thorax/Body 51%; Flagellum/Head+Thorax 45%; Wing/Body 89%; Ovip/Body 0%.

**Antennae:** 11(1r)53; dark to mid-brown; heavily clubbed, with long, pale hairs; long, swollen, dark pedicel and golden scape; unequal in length; long, swollen, dark pedicel & long, slender golden-brown scape.

**Head:** yellow, with dark back; hairy and granulated; red ocelli.

**Eyes:** pale red-brown.

**Mouthparts:** chestnut-tipped mandibles; small, dull yellow appendages.

**Thorax:** variable from virtually all yellow to considerable amounts of dark brown; mesoscutum punctate-reticulate with network of fine microsculpture, white hairs; notaulices deep & complete; tegulae dirty yellow; small near-separated foveae; scutellum punctate-reticulate with network of fine microsculpture; mesepimeron part punctate-reticulate, part striate.

**Legs:** yellow tarsi with dark claws; the remainder yellow beneath, with dark brown above, giving striped appearance;

**Wings:** dark fascia, rounded away from wing edge and below stigma; neutral hairs & pale veins.

**Gaster:** glossy, varies from dark brown, with small yellow patch on side, to almost all yellow; *Synergus*-shape; long petiole; glossy; hairy along length of ovipositor sheaths, beneath; segmented.

**Ovipositor sheaths:** projecting a fraction beneath, but running along bottom of gaster.

♂ X 13

**Impression:** NON-METALLIC; BODY COLOUR VARIABLE FROM MOSTLY YELLOW TO AMOUNTS OF DARK BROWN; YELLOW & BROWN STRIPED LEGS; YELLOW-BROWN ANTENNAE; CLOUDED WINGS; PETIOLATE. ONE ring, FOUR funicular & FIVE tarsal segments.

**Length:** Body 1.6mm (1.1-2.1)

**Ratios:** Head+Thorax/Body 58%; Fl/Head+Thorax 46%; Wing/Body 92%.

**Antennae:** 11(1r)43; dark and hairy; unequal in length; tapering, clubbed, all yellow, with darker upper side, scape & pedicel.

**Head:** from predominantly brown to yellow, but always with dark brown rear; coriaceous; translucent white ocelli.

**Eyes:** pale red, mid-sized.

**Mouthparts:** small, mid-yellow-brown appendages, with dark-tipped yellow mandibles.

**Thorax:** variable from brown to yellow; mesoscutum punctate-reticulate with network of fine microsculpture; full-length notaulices; dirty yellow tegulae; scutellum punctate-reticulate with network of fine microsculpture; small near-separated foveae; mesepimeron part punctate-reticulate, part striate.

**Legs:** brown coxae, femora and tibiae; yellow joints; yellow-brown tarsi with dark claws.

**Wings:** clear, with dark cloud, which is rounded away from wing edge; dark brown marginal vein with distinct clear area before stigmal.

**Gaster:** glossy dark brown, with more or less yellow below; long petiole, with tiny, square body.



## **Common factors for Torymidae in this section.**

METALLIC - LARGELY GREEN

FIVE TARSAL SEGMENTS

ONE RING + SEVEN FUNICULAR SEGMENTS

LARGE PRONOTUM

NOTAULICES COMPLETE & DEEP

SHORT STIGMAL & POST-MARGINAL VEINS

PEDUNCULATE

OVIPOSITOR SHEATHS LONG & HIGHLY VISIBLE



♀  
typical shapes (not to scale)



♂



*Megastigmus dorsalis* (Fabricius 1798) - TORYMIDAE

♀ X 33

**Impression:** METALLIC GREEN & YELLOW HEAD & THORAX; BROWN & YELLOW GASTER; YELLOW LEGS; YELLOW-BROWN ANTENNAE; LONG OVIPOSITOR SHEATHS. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 3.2mm (1.9-4.1)

**Ratios:** Head+Thorax/Body 57%; Flagellum/Head+Thorax 63%; Wing/Body 98%; Ovip/Body 76%.

**Antennae:** 11(1r)73; yellow-brown, with dark joints; scape dark above, testaceous below; tapered to long club; hairy.

**Head:** rich yellow, with sharply defined dark metallic green patch on vertex; large dark ocelli.

**Eyes:** red-brown, contrasting with rest of head.

**Mouthparts:** small rich yellow appendages; rich yellow mandibles with chestnut tips.

**Thorax:** variable amounts of defined dark metallic green on top and sides, changing to yellow with traces of brown beneath; pronotum with heavy cross-striae; mesoscutum heavily cross-strigose; notaulices deep and complete; scutellum rugose; straw-coloured tegulae; mesepimeron yellow, with longitudinal striae.

**Legs:** all yellow, with dark claws; sometimes brown on rear coxa.

**Wings:** large, oval, dark stigma (picture on next page); clear wings with mid-brown hairs/veins; the shape of the cloud which surrounds the stigma can vary considerably.

**Gaster:** rich brown top with points running down yellow sides; yellow beneath.

**Ovipositor sheaths:** black; hairy.

♂ X 17

**Impression:** VARIABLE; PLAIN YELLOW & METALLIC GREEN HEAD; ALL DARK GREEN METALLIC THORAX; CHOCOLATE & YELLOW GASTER; BROWN & YELLOW LEGS; DARK ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 2.8mm (1.6-3.5)

**Ratios:** Head+Thorax/Body 61%; Fl/Head+Thorax 62%; Wing/Body 91%.

**Antennae:** 11(1r)73; dirty gold with dark joints; slender, slight club.

**Head:** yellow with dark green metallic patch on vertex; large chestnut-red ocelli .

**Eyes:** red-brown, large and contrasting vividly with rest of head.

**Mouthparts:** small dark yellow appendages; mandibles deep yellow tipped with chestnut.

**Thorax:** dark-green metallic; sometimes shading to brown/butter-yellow below but giving much darker appearance than female; sparsely covered with long hair; pronotum with very heavy cross-striae; mesoscutum with heavy cross-striae; deep full-length notaulices; straw-coloured tegulae; scutellum rugose; green mesepimeron with heavy longitudinal striae.

**Legs:** pale yellow, with brown tops to mid and rear coxae, dark claws.

**Wings:** clear, hairy, with large broadly circular stigma, with spike, edging into faint cloud away from wing-edge (picture on next page); the cloud that surrounds the stigma may vary considerably in shape.

**Gaster:** small, dark chocolate, pale beneath; yellow bar at tip.





*Megastigmus stigmatizans* (Fabricius 1798) - TORYMIDAE

♀ X 3

**Impression:** PLAIN YELLOW AND METALLIC RED-SHOT GREEN HEAD & THORAX; GASTER YELLOW WITH SOME BROWN; METALLIC & YELLOW LEGS; DARK ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body **6.3mm** (5.9-6.8)

**Ratios:** Head+Thorax/Body 56%; Flagellum/Head+Thorax 58%; Wing/Body **83%**; Ovip/Body **113%**.

**Antennae:** 11(1r)73; dark, short and heavy; longitudinal hairs on each segment.

**Head:** yellow with red-green metallic patch on vertex; ocelli dark beige.

**Eyes:** bright red; large; contrasting vividly with rest of head.

**Mouthparts:** pale yellow appendages; darker mandibles.

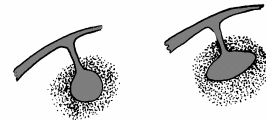
**Thorax:** variable amounts of defined metallic red-shot green on sides and on top, contrasting with yellow and traces of brown beneath; some hairs; long pronotum with strong cross-striae; mesoscutum rugose with strong cross-striae; deep full-length notaulices; translucent colourless tegulae; scutellum rugose; dull, smooth caramel-brown mesepimeron.

**Legs:** metallic hairy coxae; the rest pale yellow, with dark claws.

**Wings:** dark stigma capsule, twice as long as wide - not including cloud beyond; (see below).

**Gaster:** mainly dull mid-yellow, touched with dark brown above; deeply triangular and heavy.

**Ovipositor sheaths:** long, dark and very hairy; at least as long as whole body



*M. dorsalis*   *M. Stigmatizans*

♂ X 5

**Impression:** VARIABLE PLAIN YELLOW & METALLIC GREEN HEAD & THORAX; CHOCOLATE GASTER ; BROWN & YELLOW LEGS; DARK ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body **5.2mm** (4.5-6.3)

**Ratios:** Head+Thorax/Body 62%; Fl/Head+Thorax 52%; Wing/Body **80%**.

**Antennae:** 11(1r)73; dark, short and heavy; longitudinal hairs on each segment.

**Head:** yellow with dark green metallic patch on vertex; ocelli dark beige.

**Eyes:** conspicuous red.

**Mouthparts:** pale yellow appendages; darker mandibles.

**Thorax:** varies, but many have metallic green all over, others with more or less yellow on sides and beneath; hairy; deep full-length notaulices.

**Legs:** pale yellow, hairy; dark marks on rear femora; dark rear coxa.

**Wings:** dark stigma capsule, not including cloud beyond, twice as long as wide.

**Gaster:** dark chocolate, no rear yellow band; yellowish beneath; glossy; small, triangular from above, square back from side.



***Torymus affinis*** (Fonscolombe 1832) - TORYMIDAE

♀ X 85

**Impression:** BRILLIANT GREEN METALLIC BODY; METALLIC & YELLOW LEGS; METALLIC & BRONZE ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body **3.0mm** (2.0-3.8)

**Ratios:** Head + Thorax/Body 52%; Fl/Head + Thorax 56%; Wings/Body **98%**; Ovip/Body **194%**.

**Antennae:** 11(1r)73; metallic green scape & pedicel; rest dark bronze-gold, with long sensillae; heavy but not tapered.

**Head:** bright blue-green metallic, sometimes strongly gold tinted; sculptured, with white hairs; red ocelli.

**eyes:** red-brown, medium size.

**Mouthparts:** dark hairy small appendages; dark mandibles with chestnut at tip.

**Thorax:** brilliant green metallic, white hairs; mesoscutum with cross sculpture; short notaulices, wide at back; dark tegulae; scutellum with transverse furrow; high-gloss mesepimeron.

**Legs:** brilliant metallic green coxa, femur & tibia; yellow tarsi with darker ends.

**Wings:** mid-yellow veins & hairs; very short stigmal & post-marginal veins.

**Gaster:** brilliant metallic green, with some translucent brown below; faint coriaceous microsculpture; **triangular from side.**

**Ovipositor sheaths:** extremely long & slender, often twice whole body; dark top, paler beneath, hairy.

♂ x 113

**Impression:** BRIGHT METALLIC GREEN BODY; METALLIC & YELLOW LEGS; DARK ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body **2.3mm** (1.3-3.3)

**Ratios:** Head + Thorax/Body 59%; Fl/Head + Thorax 58%; Wings/Body **100%**.

**Antennae:** 11(1r)73; metallic scape & pedicel; rest neutral/bronze, hairy; heavy, not tapered.

**Head:** bright green metallic, sometimes gold tinted; sculptured, with white hairs; red ocelli.

**Eyes:** red-brown, medium size.

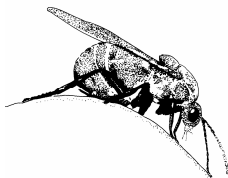
**Mouthparts:** pale brown to darker appendages and mandibles.

**Thorax:** brilliant green metallic, some with golden lights; white hairs; mesoscutum with cross sculpture; short notaulices, wide at back; dark metallic tegulae; scutellum with transverse furrow; high-gloss mesepimeron;

**Legs:** metallic green coxae, femora & tibiae; no hairs on top of coxae; yellow tarsi with darker ends.

**Wings:** mid-yellow veins & hairs; very short stigmal & post-marginal veins.

**Gaster:** brilliant metallic gold-green; short & tubular, with point.



*Torymus auratus (=nitens)* (Müller 1764) - TORYMIDAE

♀ X 93

**Impression:** BRILLIANT METALLIC GREEN BODY; YELLOW LEGS, DARK ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 3.5mm (2.0-5.3)

**Ratios:** Head + Thorax/Body 53%; Flagellum/Head + Thorax 59%; Wing/Body 98%; Ovip/Body 122%.

**Antennae:** 11(1r)73; dark grey-brown, with longitudinal pale sensillae and yellow marked scape; heavy, with no obvious club.

**Head:** green and blue metallic all over; reticulate; dark red-brown ocelli.

**Eyes:** quite large; red, with internal darker latticework.

**Mouthparts:** gold appendages; mid-brown mandibles.

**Thorax:** bright metallic green, with gold and red tints; sparse pale hairs; mesoscutum granulate; deep full-length notaulices; straw-coloured tegulae; scutellum uniform, granulate; high-gloss coppery mesepimeron.

**Legs:** pale yellow; metallic coxae; metallic femora sometimes bronze-green; a number of long white hairs above hind coxae.

**Wings:** clear, with pale yellow veins and hairs; short stigmal vein with well-developed stigma and uncus.

**Gaster:** bronzy metallic green, triangular shape from side, lightly punctate; shiny.

**Ovipositor sheaths:** long, dark brown and hairy.

♂ X 73

**Impression:** GLISTENING ALL METALLIC-GREEN HEAD & THORAX, WITH BRONZE TINTS; BRONZE & TESTACEOUS GASTER; METALLIC & YELLOW LEGS; GREY-BROWN ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 2.6mm (1.7-4.2)

**Ratios:** Head + Thorax/Body 58%; Fl/Head + Thorax 55%; Wing/Body 95%.

**Antennae:** 11(1r)73; dark grey-brown, heavy-looking, no obvious club; pale longitudinal sensillae; scape all dark; third segment longer than pedicel (*see T. geranii*).

**Head:** metallic green; short hairs all over, lightly sculpted..

**Eyes:** very bright red.

**Mouthparts:** pale yellow appendages and mid-brown mandibles.

**Thorax:** covered in short hairs, light sculpting all over; metallic green; mesoscutum with thick curved rugose cross-striae; deep full-length notaulices; neutral-brown tegulae scutellum uniform with curved rugose cross-striae; high-gloss mesepimeron.

**Legs:** variable yellow, and from metallic green rear coxae only to metallic green coxae, femora and tibiae, the rest brown, with paler yellow joints; numbers of long white hairs above rear coxae.

**Wings:** slightly yellowish, hairy all over; strong veining; very short stigmal vein with quite heavy stigma.

**Gaster:** testaceous band in final third, otherwise bronze all over; slightly hairy and lightly whorled and ridged all over.



*Torymus chloromerus* (Walker 1833) - TORYMIDAE

♀ X 3

*Impression:* BRIGHT GREEN METALLIC BODY WITH BRILLIANT BLUE TINTS; METALLIC GREEN, BROWN & YELLOW LEGS; DARK BRASSY ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

*Length:* Body 2.7mm (2.5-2.9)

*Ratios:* Head + Thorax/Body 54%; Fl/Head + Thorax 56%; Wings/Body 97%; Ovip/Body 80%.

*Antennae:* 11(1r)73; dark brassy; yellow scape; metallic pedicel; prominent pale sensillae; heavy, with distinct club.

*Head:* bright metallic green with some blue tints; coriaceous; large red ocelli.

*Eyes:* red, moderately large.

*Mouthparts:* dark brown appendages, with yellowish mandibles.

*Thorax:* bright metallic green & blue; mesoscutum coriaceous with plenty of short pale hairs; full-length notaulices; tegulae testaceous; scutellum uniform; mesepimeron glossy with faint sculpture.

*Legs:* metallic bright green coriaceous coxae & femora; brown tibiae; the ends of each leg section, and joints, yellow; brown 'socks' at end.

*Wings:* clear; pale, unobtrusive hairs and pale yellow veins; short stigma & long post-marginal vein.

*Gaster:* bright metallic green with blue; the underneath fading into dark translucent testaceous colour; glossy with some sculpture in parts.

*Ovipositor sheaths:* mid-length, mid-brown, short hairs.

♂ X 3

*Impression:* BRIGHT METALLIC GREEN BODY, WITH SOME BLUE TINTS; METALLIC GREEN, BROWN & YELLOW LEGS; DARK BRASSY ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

*Length:* Body 2.2mm (1.5-2.6)

*Ratios:* Head + Thorax/Body 58%; Fl/Head + Thorax 58%; Wings/Body 83%.

*Antennae:* 11(1r)73; brassy; bright metallic scape; brown pedicel; prominent pale sensillae/hairs; distinct club.

*Head:* bright metallic green; coriaceous (fine-grained leathery); strong white hairs; large deep red ocelli.

*Eyes:* red, moderately large.

*Mouthparts:* gold/brown mandibles, golden appendages.

*Thorax:* bright metallic green with occasional blue tints with sparse white hairs; mesoscutum glossy coriaceous; full-length notaulices; tegulae dark & pale brown; scutellum uniform; mesepimeron glossy, unsculpted;.

*Legs:* metallic bright green coriaceous coxae & femora; brown tibiae; tarsi; the ends of each leg section, and joints, yellow; brown 'socks'.

*Wings:* clear; pale, unobtrusive hairs and pale yellow veins; short stigma & long post-marginal vein.

*Gaster:* variable, from all bright metallic green with some blue tints, to a mix with mid-brown; narrow, deep, compact shape.



*Torymus cyaneus* Walker 1847 - TORYMIDAE

♀ X 8

**Impression:** BRILLIANT BLUE-GREEN METALLIC HEAD & THORAX WITH GOLD TINTS; GREEN & EXTENSIVE BLUE GASTER; METALLIC & LARGELY DARK LEGS; DARK ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body **3.4mm** (2.6-4.0)

**Ratios:** Head + Thorax/Body 54%; Fl/Head + Thorax 55%; Wings/Body **97%**; Ovip/Body **61%**.

**Antennae:** 11(1r)73; grey-brown; fat deep dirty orange scape, metallic on side; stout; covered in pale hairs.

**Head:** green metallic; leathery sculpture; plentiful white hairs; large red ocelli.

**Eyes:** large, red.

**Mouthparts:** dark neutral-brown appendages & mandibles.

**Thorax:** polished green metallic with little sculpture & pale hairs; mesoscutum with cross sculpture & plentiful hairs; deep full-length notaulices; blue-green tegulae; scutellum with transverse furrow; high-gloss mesepimeron.

**Legs:** green metallic coxae & femora; tibiae brown; tarsi yellow.

**Wings:** colourless hairs; brown veins, very short stigmal vein.

**Gaster:** brilliant polished green & blue metallic, with variable testaceous beneath.

**Ovipositor sheaths:** dark; mid-length.

♂ X 3

**Impression:** BRIGHT DARK BLUE-GREEN HEAD & THORAX; VERY DARK GASTER WITH METALLIC TINTS; METALLIC & PALE LEGS; DARK ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body **2.5mm** (2.2-2.7)

**Ratios:** Head + Thorax/Body 60%; Fl/Head + Thorax 57%; Wings/Body **94%**.

**Antennae:** 11(1r)73; dark; stout; covered in pale hairs.

**Head:** bright metallic blue-green; leathery sculpture; long white hairs; red ocelli.

**Eyes:** large, red.

**Mouthparts:** chestnut mandibles, tiny dark appendages.

**Thorax:** bright metallic green & blue, with traces of red; long white hairs; mesoscutum with cross-sculpture & plentiful hairs; deep full-length notaulices; blue-green tegulae; scutellum with transverse furrow; high-gloss mesepimeron.

**Legs:** metallic coxae, femora and part of tibiae; pale joints; yellow basitarsus with dark remainder – with the appearance of 'socks'.

**Wings:** pale veins and hairs; strong stigma; short stigmal & short but wide post-marginal vein.

**Gaster:** dark, with varying amounts of metallic green and rich blue; smooth first segment; the remainder with a central line of long golden hairs plus cross-striae.



*Torymus erucarum* (Schrank 1781) - TORYMIDAE

♀ X 7

**Impression:** PURPLE METALLIC HEAD & THORAX; DISTINCTIVE BROWN BANDED GASTER BANDED OR SPOTTED WITH YELLOW; PALE YELLOW & METALLIC LEGS; DARK ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 4.1mm (1.9-2.5)

**Ratios:** Head + Thorax/Body 53%; Fl/Head + Thorax 53%; Wings/Body 91%; Ovip/Body 138%.

**Antennae:** 11(1r)73; very dark, with touch of metallic green and a hint of gold between segments; yellow & brown scape; sensillae present.

**Head:** purple-bronze, sculpted, with white hairs.

**Eyes:** mid-size, red-brown

**Mouthparts:** pale yellow appendages, darker mandibles.

**Thorax:** metallic purple; sculpted, with white hairs; deep full-length notaulices; scutellum uniform.

**Legs:** dark metallic purple/green coxae, with the rest pale yellow.

**Wings:** yellowish veins and hairs, hairy; very short stigmal & short post-marginal vein.

**Gaster:** the base dark bronze/brown, then a testaceous/yellow band extending right round body, with blob of brown at top; triangular from side, with broad, pointed top;.

**Ovipositor sheaths:** very long, dark brown.

♂ X 6

**Impression:** PURPLE METALLIC HEAD & THORAX; DISTINCTIVE BROWN GASTER WITH PARTIAL YELLOW BAND; METALLIC & TESTACEOUS LEGS; DARK ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 2.8mm (2.7-3.1)

**Ratios:** Head + Thorax/Body 54%; Fl/Head + Thorax 66%; Wings/Body 94%.

**Antennae:** 11(1r)73; dark brown; scape dark brown & yellow; yellow/brown club, not tapered.

**Head:** purple-bronze, sculpted, with white hairs.

**Eyes:** mid-size, red-brown.

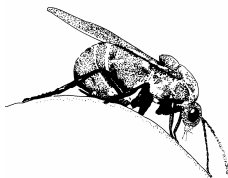
**Mouthparts:** dark neutral yellow appendages; darker, chestnut-tipped mandibles.

**Thorax:** metallic purple, with sculpture and white hairs; deep full-length notaulices; scutellum uniform.

**Legs:** dark metallic purple/green coxae, with rest pale testaceous.

**Wings:** yellowish veins and hairs, hairy; very short stigmal & short post-marginal vein.

**Gaster:** mostly bronze/brown, with testaceous band running round the body but ending at top of sides, showing as a constriction in the darker colouring; broad, with pointed top;.



**Torymus fastuosus** Boheman 1834 - TORYMIDAE

♀ X 4

**Impression:** COPPER-GREEN METALLIC BODY; DARK LEGS & ANTENNAE; MODEST OVIPOSITOR SHEATHS. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body **3.6mm** (3.0-3.9)

**Ratios:** Head + Thorax/Body 58%; Fl/Head + Thorax 55%; Wings/Body **89%**; Ovip/Body **47%**.

**Antennae:** 11(1r)73; dark grey; yellow/brown scape & metallic pedicel; not tapered; hairy; sensillae.

**Head:** bright green metallic; sculpted, with white hairs.

**Eyes:** bright red.

**Mouthparts:** dark brown appendages, with yellowish mandibles.

**Thorax:** coppery/green metallic; coriaceous sculpture; white hairs; deep full-length notaulices; scutellum with transverse furrow.

**Legs:** copper metallic coxae & femora; brown tibiae, yellow tarsi.

**Wings:** brown hairs and veins; short stigmal & post-marginal veins.

**Gaster:** copper metallic; triangular from side; high gloss.

**Ovipositor sheaths:** dark brown above, pale below; hairy; moderate length.

♂ X 8

**Impression:** METALLIC GREEN BODY; DARK & YELLOW LEGS; DARK ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body **2.6mm** (1.9-3.1)

**Ratios:** Head + Thorax/Body 60%; Fl/Head + Thorax 57%; Wings/Body **100%**.

**Antennae:** 11(1r)73; dark grey funicle; dark metallic scape & pedicel; sensillae; heavy, but not tapered.

**Head:** metallic green; sculptured; with white hairs.

**Eyes:** bright red.

**Mouthparts:** dark brown appendages; golden mandibles.

**Thorax:** metallic green; sculpted, with white hairs; deep full-length notaulices; scutellum with transverse furrow.

**Legs:** green metallic coxae and femora, brown tibia and yellow tarsi; long, swollen femora; banded yellow joints.

**Wings:** brown hairs & veins; short stigmal & post-marginal veins.

**Gaster:** metallic green; short & wide.



*Torymus flavipes (=auratus)* (Walker 1833) - TORYMIDAE

♀ X 62

**Impression:** BRILLIANT METALLIC GOLDEN-GREEN; YELLOW LEGS; DARK BROWN ANTENNAE; MID-LENGTH OVIPOSITOR SHEATHS. ONE Ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 2.5mm (1.7-3.3)

**Ratios:** Head + Thorax/Body 58%; Fl/Head + Thorax 59%; Wings/Body 113%; Ovip/Body 58%.

**Antennae:** 11(1r)73; dark brown; yellow-marked scape; pale sensillae running along the segments; slight taper to continuous club.

**Head:** metallic green; coriaceous; red-brown tinted, almost colourless, ocelli.

**Eyes:** large and bright red.

**Mouthparts:** chestnut-tipped gold-brown mandibles, pale-neutral small appendages.

**Thorax:** metallic green-gold & bronze; mesoscutum coriaceous; notaulices nearly full-length; straw-coloured tegulae; scutellum uniform, coriaceous; high-gloss mesepimeron.

**Legs:** metallic green coxa with only a few long, pale hairs on top of rear pair; the rest pale yellow, with darker claws.

**Wings:** clear; hairy, pale brown hairs with yellow-brown veins; very short stigmal vein, well-formed stigma and uncus.

**Gaster:** brilliant metallic gold/green, with visible segments; triangular side-view, thin from above; lightly sculpted/punctured; shiny.

**Ovipositor sheaths:** hairy, dark above and yellowish below; well extended, but not particularly long.

♂ X 35

**Impression:** METALLIC GREEN HEAD & THORAX; GREEN & BRONZE GASTER; DARK ANTENNAE; YELLOW LEGS. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 2.4mm (1.6-2.9)

**Ratios:** Head + Thorax/Body 61%; Fl/Head + Thorax 62%; Wings/Body 100%.

**Antennae:** 11(1r)73; grey-brown; round, glossy pedicel; moderately-sized fat scape with yellow marks; longitudinal sensillae, not tapered.

**Head:** bright metallic green; coriaceous; hairy; almost colourless ocelli.

**Eyes:** large bright red.

**Mouthparts:** bright yellow to yellow-brown appendages & mandibles.

**Thorax:** bright green metallic, with some gold & bronze tinges, hairy; coriaceous mesoscutum; deep full-length notaulices; straw-coloured tegulae; scutellum uniform, coriaceous; high-gloss mesepimeron.

**Legs:** metallic green coxae, with a few long pale hairs on top of rear pair; the rest yellow with dark brown, or metallic green, markings in middle of femur/tibia; bright yellow joints; darker claws.

**Wings:** clear, with pale yellow-brown veins and grey-brown hairs, short stigmal vein and sizable stigma.

**Gaster:** shining dark metallic green, changing to bronze in rear half, some hairs; quite full from side, slender above.





*Torymus formosus* (Walker 1833) - TORYMIDAE

♀ X 5

**Impression:** HEAD & THORAX GLOWING COPPER METALLIC WITH GOLD & GREEN TINTS; GOLDEN-BROWN, COPPERY GASTER; NEUTRAL-BROWN ANTENNAE; LARGELY YELLOW LEGS; MID-LENGTH OVIPOSITOR SHEATHS. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body **3.1mm** (2.3-4.1)

**Ratios:** Head + Thorax/Body 52%; Fl/Head + Thorax 59%; Wings/Body 87%; Ovip/Body 66%.

**Antennae:** 11(1r)73; yellow first segment; the rest neutral brown; short hairs.

**Head:** metallic green, with gold tints; pale brown ocelli.

**Eyes:** brown, mid-size.

**Mouthparts:** yellow.

**Thorax:** copper with gold & green tints; granular; hairy; mesoscutum granular & punctate; deep full-length notaulices; pale neutral brown tegulae; scutellum uniform & granular/punctate; polished mesepimeron.

**Legs:** yellow-brown, with metallic green coxae.

**Wings:** mid-brown veins and paler hairs; short stigmal and shortish post stigmal veins.

**Gaster:** coppery golden-brown, with green metallic tint on first segment; polished, rounded.

**Ovipositor sheaths:** brown & hairy; medium-length.

♂ X 1

**Impression:** DARK METALLIC GREEN HEAD & THORAX; PURPLE TINTED GASTER; GOLDEN LEGS; DARK ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body **3.4mm**

**Ratios:** Head + Thorax/Body 59%; Fl/Head + Thorax -%; Wings/Body 78%.

**Antennae:** 11(1r)73; dark; long scape; small, round pedicel.

**Head:** green metallic; leathery sculpture, hairy; large brown ocelli.

**Eyes:** large, red-brown.

**Mouthparts:** testaceous mandibles, golden appendages.

**Thorax:** metallic green, with bronze tints, hairy; mesoscutum with heavy cross sculpture; deep full-length notaulices; dark testaceous tegulae; scutellum uniform; mesepimeron glossy with slight microsculpture.

**Legs:** reticulated metallic green coxae; the rest dark golden-yellow; hairy.

**Wings:** translucent; dark hairs and pale brown veins.

**Gaster:** first segment glossy dark green metallic; the remainder purple tinged, with leathery microsculpture.



*Torymus geranii* (Walker 1833) - TORYMIDAE

♀ X 18

**Impression:** GLEAMING METALLIC BRONZE, GREEN AND BLUE HEAD & THORAX; ALWAYS SOME TESTACEOUS-PINK BENEATH GREEN & BRONZE GASTER; YELLOW LEGS; DARK ANTENNAE; LONG OVIPOSITOR SHEATHS. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 3.4mm (2.8-4.6)

**Ratios:** Head + Thorax/Body 53%; Flagellum/Head + Thorax 56%; Wing/Body 93%; Ovip/Body 98%.

**Antennae:** 11(1r)73; dark brown; yellow-tinged scape; 3<sup>rd</sup> segment shorter than pedicel; short and stout.

**Head:** hairy cheeks, blue and green metallic; dark neutral brown ocelli.

**Eyes:** brilliant red.

**Mouthparts:** gold appendages and mid-brown tipped paler mandibles.

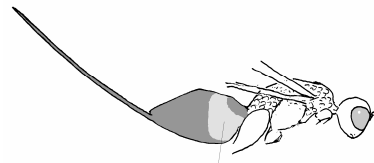
**Thorax:** blue, bronze and green metallic; mesoscutum cross granulate-punctate; deep full-length notaulices; straw-coloured tegulae; scutellum uniform, granulate-punctate; high-gloss mesepimeron.

**Legs:** reticulate metallic green coxae, the rest pale yellow; rear coxae with fringe of long white hairs above.

**Wings:** transparent, dark yellow-brown veins & pale hairs; well-developed stigma and uncus; short stigmal vein.

**Gaster:** green & bronze metallic with more or less testaceous-pink at front and beneath; (if none, it will be *T. auratus*).

**Ovipositor sheaths:** long, dark brown & hairy.



♂ X 22

**Impression:** METALLIC-GREEN HEAD & THORAX; BRONZE & TESTACEOUS GASTER; METALLIC & YELLOW LEGS, DARK ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 2.5mm. (1.5-4.2)

**Ratios:** Head + Thorax/Body 58%; Fl/Head + Thorax 56%; Wing/Body 91%.

**Antennae:** 11(1r)73; dark grey-brown; yellow socket to scape; third segment shorter than pedicel (*see T. auratus*); heavy without club; pale longitudinal sensillae.

**Head:** metallic green; short hairs all over, lightly sculpted; chestnut to dark ocelli.

**eyes:** bright red.

**Mouthparts:** pale yellow appendages and mid-brown mandibles.

**Thorax:** metallic green, covered in short hairs; mesoscutum cross granulate-punctate; deep full-length notaulices; straw-pale brown tegulae; scutellum uniform, granulate-punctate; high-gloss mesepimeron.

**Legs:** variable yellow; and from reticulate metallic green rear coxae only to metallic coxae, femora and tibiae; the rest brown, with paler yellow joints; many long white hairs above rear coxae.

**Wings:** slightly yellowish; hairy all over; strong veining; very short stigmal vein with quite heavy stigma.

**Gaster:** bronze all over; with testaceous band near base; hairy and lightly whorled and ridged all over.



*Torymus nobilis* Boheman 1834 - TORYMIDAE

♀ X 19

**Impression:** DARK, PURPLISH METALLIC HEAD & THORAX; DARK & PALE BROWN GASTER; PURPLE & TESTACEOUS LEGS; DARK ANTENNAE; MEDIUM-LENGTH OVIPOSITOR SHEATHS. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body **3.0mm** (2.5-3.3)

**Ratios:** Head + Thorax/Body 55%; Fl/Head + Thorax 62%; Wings/Body **84%**; Ovip/Body **58%**.

**Antennae:** 11(1r)73; dark neutral-brown; yellow/brown scape; long sensillae; not tapered.

**Head:** dark green metallic, with purple tints; sculpted, with white hairs.

**Eyes:** red.

**Mouthparts:** yellow appendages & slightly darker mandibles.

**Thorax:** dark purple/green metallic with sculpture and white hairs; deep full-length notaulices; scutellum uniform.

**Legs:** purple metallic coxae with testaceous end; the rest mid yellow/brown.

**Wings:** clear, with mid-brown hairs and veins; shortish stigmal and short post-marginal veins.

**Gaster:** testaceous, with darker top at base, or with band of purple/bronze at the front and rear.

**Ovipositor sheaths:** dark brown top, paler below; hairy.

♂ X 19

**Impression:** DARK PURPLE METALLIC HEAD & THORAX; GASTER BANDED BROWN, PURPLE & TESTACEOUS; PURPLE & MID-BROWN LEGS; DARK ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body **2.1mm** (1.8-2.9)

**Ratios:** Head + Thorax/Body 60%; Fl/Head + Thorax 61%; Wings/Body **90%**.

**Antennae:** 11(1r)73; all dark; hairy, with sensillae; not tapered.

**Head:** very dark purple metallic; sculpted, with white hairs.

**Eyes:** red.

**Mouthparts:** yellow appendages & darker mandibles.

**Thorax:** dark purple metallic; sculpted, with white hairs; deep full-length notaulices; scutellum uniform.

**Legs:** metallic purple coxa with pale end; the rest brown/yellow.

**Wings:** transparent, with mid-brown hairs and veins; shortish stigmal and short post-marginal veins.

**Gaster:** banded with brown, tinting to purple at rear and a short patch of purple at front; the remainder testaceous; quite long, broad and pointed.



*Torymus notatus* (Walker 1833) - TORYMIDAE

♀ X 6

**Impression:** HEAD & THORAX BLUE-GREEN WITH COPPER TINTS; BRONZE-GREEN GASTER WITH TESTACEOUS STREAK; METALLIC & MAINLY DARK LEGS; GOLD-BROWN ANTENNAE; MODERATE-LENGTH OVIPOSITOR SHEATHS. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 2.4mm (1.8-2.8)

**Ratios:** Head + Thorax/Body 56%; Fl/Head + Thorax 60%; Wings/Body 100%; Ovip/Body 65%.

**Antennae:** 11(1r)73; golden-brown funicle; metallic bronze scape and pedicel; sensillae; heavy, but not tapered.

**Head:** bright metallic green, copper & blue; sculpted, with white hairs.

**Eyes:** red-brown.

**Mouthparts:** dark brown appendages, lighter mandibles.

**Thorax:** bright metallic green, copper & blue; sculpted, with white hairs; deep full-length notaulices; scutellum with transverse furrow.

**Legs:** metallic coxa and femur; tibiae dark brown, with pale tarsi.

**Wings:** yellow/brown hairs and veins; short stigmal and post-marginal veins; hairy fringes.

**Gaster:** metallic glossy, green/bronze, with testaceous streak beneath; pedunculate.

**Ovipositor sheaths:** moderate length; dark brown and hairy.

♂ X 6

**Impression:** HEAD & THORAX METALLIC BLUE-GREEN WITH COPPER TINTS; METALLIC GREEN-BROWN GASTER; METALLIC LEGS; DARK ANTENNAE;. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 1.7mm (1.5-1.9)

**Ratios:** Head + Thorax/Body 64%; Fl/Head + Thorax 67%; Wings/Body 109%.

**Antennae:** 11(1r)73; Dark metallic bronze, with bright green scape; sensillae; heavy but not tapered.

**Head:** bright metallic green, copper & blue; sculpted, with white hairs.

**Eyes:** red-brown.

**Mouthparts:** dark appendages with paler mandibles.

**Thorax:** bright metallic green, copper & blue; sculpted, with white hairs; deep full-length notaulices. scutellum with transverse furrow.

**Legs:** metallic coxae, femora & tibiae, with pale tarsi.

**Wings:** yellow/brown hairs and veins; short stigmal and post-marginal veins.

**Gaster:** green/brown metallic; triangular; tiny.



*Torymus roboris* (Walker 1833) - TORYMIDAE

♀ X 7

*Impression:* PURPLE HEAD & THORAX, ORANGE GASTER TAPERING TO PURPLE; ORANGE-YELLOW LEGS; DARK BRONZE ANTENNAE; LONGISH OVIPOSITOR SHEATHS. ONE ring, SEVEN funicular, FIVE tarsal segments.

*Length:* Body **3.4mm** (2.8-4.1)

*Ratios:* Head + Thorax/Body 51%; Fl/Head + Thorax 62%; Wings/Body **77%**; Ovip/Body **79%**.

*Antennae:* 11(1r)73; dark bronze; long orange scape, small pedicel marked with orange; tapered; segments well separated.

*Head:* dark purple; smooth, with pattern of pale hairs; large brown ocelli.

*Eyes:* medium large; dark.

*Mouthparts:* orange mandibles & appendages.

*Thorax:* dark purple metallic with traces of green; mesoscutum & scutellum reticulated; full-length notaulices; tegulae testaceous; scutellum uniform; mesepimeron smooth & semi-glossy.

*Legs:* all brilliant orange-yellow except for part-brown rear coxae.

*Wings:* clear but brown-tinted appearance because of deep brown hairs; brown veins.

*Gaster:* testaceous at front shading into dark purple for rest; pale hairs.

*Ovipositor sheaths:* dark with bronze tints, longish.

♂ X 2

*Impression:* DARK PURPLE TINGED HEAD & THORAX; GASTER PURPLE-TINGED BRONZE WITH ORANGE; DARK YELLOW LEGS; BRONZE ANTENNAE. ONE ring, SEVEN funicular, FIVE tarsal segments.

*Length:* Body **2.2mm**.

*Ratios:* head + thorax/body 54%; fl/head + thorax 67%; wings/body **85%**.

*Antennae:* 11(1r)73; all bronze; long reticulated scape; round pedicel, the rest heavy.

*Head:* dark with purple notes; pale hairs; translucent pale ocelli.

*Eyes:* dark, large.

*Mouthparts:* orange-brown mandibles; yellow appendages.

*Thorax:* dark, purple-shot; reticulated scutellum & mesoscutum; full-length notaulices; testaceous tegulae; scutellum uniform; smooth mesepimeron.

*Legs:* yellow, with dark markings on coxae.

*Wings:* clear; mid-density veins & hairs; short post-marginal vein.

*Gaster:* dark neutral bronze-brown, with some purple tones; dirty orange on sides at front.



*Torymus scutellaris* (Walker 1833) - TORYMIDAE

♀ X 3

**Impression:** HEAD & THORAX METALLIC GREEN WITH GOLD TINTS; GASTER HALF TESTACEOUS WITH GREEN REAR; LEGS YELLOW; ANTENNAE DARK; MID-LENGTH OVIPOSITOR SHEATHS. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 2.9mm (2.3-3.5)

**Ratios:** Head + Thorax/Body 53%; Fl/Head + Thorax 66%; Wings/Body 95%; Ovip/Body 80%.

**Antennae:** 11(1r)73; dark grey-brown; long and fairly slender; hairy.

**Head:** golden tinted green metallic; reticulated; hairy.

**Eyes:** large, red-brown.

**Mouthparts:** pale yellow appendages; light chestnut mandibles.

**Thorax:** bright green metallic with pale hairs; mesoscutum with transverse sculpture; notaulices complete; tegulae testaceous; scutellum uniform, with transverse sculpture; mesepimeron glossy and unsculpted.

**Legs:** metallic green coxae, fading to pale yellow at end; the rest all pale yellow, with dark feet; hairy.

**Wings:** clear; pale hairs and veins; short stigmal and longer post-marginal veins.

**Gaster:** the front half testaceous, the rear green metallic; deep, triangular from side; hairy; semi-glossy, with fine microsculpture.

**Ovipositor sheaths:** slender, dark brown.

♂ X 2

**Impression:** DARK METALLIC GREEN HEAD & THORAX; GASTER WITH TESTACEOUS FRONT, BROWN REAR; BROWN TO YELLOW LEGS; BRASSY-GOLD ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 2.0mm

**Ratios:** Head + Thorax/Body 57%; Fl/Head + Thorax 55%; Wings/Body 86%.

**Antennae:** 11(1R)73; mid brassy-gold; scape with paler yellow base; not tapered.

**Head:** darker green metallic; reticulated; hairy

**Eyes:** mid-sized, red-brown.

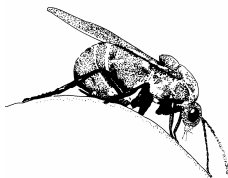
**Mouthparts:** pale yellow appendages; light chestnut mandibles

**Thorax:** darker green metallic, light hairs; mesoscutum with transverse sculpture; notaulices complete; tegulae testaceous; scutellum uniform; with transverse sculpture; mesepimeron glossy and unsculpted.

**Legs:** brown coxae, tapering to pale yellow tibiae and tarsi; dark feet; pale hairs.

**Wings:** clear; pale hairs and veins; short stigmal and longer post-marginal veins

**Gaster:** the front testaceous with brown end; hairy; wide & dull.



## Common factors for Ormyridae in this section

METALLIC - MAINLY DARK BLUE-GREEN

FIVE TARSAL SEGMENTS

TWO RING + SIX FUNICULAR SEGMENTS

PRONOTUM QUITE LONG

NOTAULICES COMPLETE

VERY LONG REAR COXAE

SHORT STIGMAL & WELL-DEVELOPED POST-MARGINAL VEIN

HEAVILY PUNCTATE GASTER

OVIPOSITOR SHEATHS VERY SHORT



typical shape ♀ (not to scale)



♂



***Ormyrus nitidulus*** (Fabricius 1804) - ORMYRIDAE

♀ X 6 (measurements made in natural position; but insects are naturally hunched and ratios may therefore vary)

**Impression:** STEEPLY HUNCHED; BODY ALL DEEP METALLIC BLUE & BLUE-GREEN; GASTER WITH BANDS OF LARGE PUNCTURATION; DARK LEGS WITH PALE KNEES AND TARSI; BLACK ANTENNAE; SHORT OVIPOSITOR. TWO ring, SIX funicular & FIVE tarsal segments.

Length: Body 5.1 (4.4-6.5)

Ratios: Head + Thorax/Body 34%; Fl/Head + Thorax 61%;

Wings/Body 73%; Ovip/Body 9%.

Antennae: 11(2R)63; parallel black antennae with large ring segments; long pedicel; scape with slight metallic tinges.

Head: blue-green; small, reticulate, heavily striate on face and cheeks; red-brown ocelli.

Eyes: large, red/brown.

Mouthparts: black appendages and mandibles.

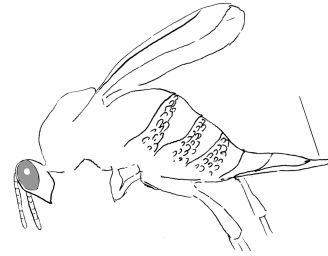
Thorax: small, metallic dark blue & blue-green; mesoscutum lightly cross-striate; notaulices faint but full-length; tegulae polished dark; scutellum cross-striate; mesepimeron polished, with tiny patch of sculpture at top.

Legs: dark metallic coxae & femora, brown tibiae and paler tarsi; joints pale.

Wings: short, clear; dark veins with very short stigmal & short post-marginal; pale hairs.

Gaster: dark metallic blue & blue-green; from side, first part large & bulky, rest abruptly slender, merging into ovipositor sheath; band of large puncturation extending across each major segment.

Ovipositor sheaths: dark; set beneath the gaster, merging into smallest segment.



♂ X 7

**Impression.** DEEPLY HUNCHED; HEAD GREEN-GOLD, BODY ALL DEEP METALLIC BLUE, PURPLE & GREEN; GASTER WITH BANDS OF PROMINENT PUNCTURATION; DARK LEGS WITH PALE KNEES AND TARSI; BLACK ANTENNAE. TWO ring, SIX funicular & FIVE tarsal segments.

Length: Body 2.2mm (2.1-2.4)

Ratios: Head + Thorax/Body 49%; Fl/Head + Thorax 50%; Wings/Body 91%.

Antennae: 11(2r)63; parallel fat black hairy antennae with large ring segments; long pedicel; scape inset into head, with slight metallic tinges.

Head: gold-green; small & hairy; large reticulations, heavily striate on face and cheeks; pale ocelli..

Eyes: eyes: large, red/brown.

Mouthparts: black appendages and mandibles..

Thorax: small, metallic dark blue, purple & blue-green; mesoscutum lightly cross-striate; notaulices faint but full-length; tegulae dark & polished; scutellum cross-striate; mesepimeron polished purple.

Legs: metallic dark coxae & femora, dark brown tibiae and paler tarsi; main joints pale..

Wings: short, clear; dark veins with very short stigmal & short post-marginal; pale hairs..

Gaster: metallic green first plain segment; the remainder purple-tinged, with large, prominent puncturation in transverse bands.

.





***Ormyrus pomaceus*** (Geoffroy in Fourcroy 1785) - ORMYRIDAE

♀ X 5 (measurements made in normal position; but insects are naturally hunched and ratios may vary)

Impression: **DARK BLUE-GREEN HEAD & THORAX; BRONZE-GREEN GASTER; DARK LEGS & ANTENNAE; TINY OVIPOSITOR SHEATHS. TWO ring, SIX funicular & FIVE tarsal segments.**

Length: **Body 2.7mm. (2.3-3.4)**

Ratios: **Head + Thorax/Body 43%; Fl/Head + Thorax 49%; Wings/Body**

**81%; Ovip/Body 4%.**

Antennae: **11(2r)63; dark; gently tapering and quite slender.**

Head: **dark, metallic blue-green; sculpted; pale red-tinged ocelli.**

Eyes: **large, red-**

Mouthparts: **dark brown appendages and mandibles.**

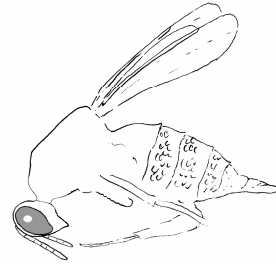
Thorax: **dark, metallic blue-green; few dark hairs; mesoscutum with cross striae; notaulices shallow but complete; tegulae neutral brown; scutellum with swirling near circular striae; mesepimeron glossy.**

Legs: **metallic coxae & part femora; the rest dark, shiny brown; paler tarsi; long rear coxae.**

Wings: **median brown hairs and veins; short stigmal, but longer post-marginal, vein.**

Gaster: **metallic, glossy; smooth green front to first segment; the rest bronze-green, with bands of puncturation; rows of longitudinal hairs across the middle of segments.**

Ovipositor sheaths: **very short and dark.**



♂ X 4

Impression: **VERY DARK METALLIC BLUE HEAD & THORAX; DARK GASTER WITH BLUE TINTS; DARK BROWN LEGS & ANTENNAE. TWO ring, SIX funicular & FIVE tarsal segments.**

Length: **Body 1.8mm (1.6-2.1)**

Ratios: **Head + Thorax/Body 55%; Fl/Head + Thorax 48%; Wings/Body 97%.**

Antennae: **11(2r)63; dark brown; relatively short; strongly tapered.**

Head: **very dark metallic blue-green; alutaceous microsculpture; dark hairs; large red-brown ocelli.**

Eyes: **large, red.**

Mouthparts: **dark mandibles; small paler appendages.**

Thorax: **very dark metallic blue-green (almost black); dark hairs; mesoscutum with transverse striae on alutaceous microsculpture; shallow full-length notaulices; black tegulae; alutaceous scutellum; mesepimeron shiny, unsculpted.**

Legs: **dark brown all over; long, curved rear tibial spur.**

Wings: **median brown hairs and veins; short stigmal, but longer post-marginal, vein.**

Gaster: **dark brown with blue tinge; double rows of huge puncturation on two front segments.**



## **Common factors for Pteromalidae in this section**

METALLIC - GREEN MAINLY

FIVE TARSAL SEGMENTS

TWO OR THREE RING + FIVE OR SIX FUNICULAR SEGMENTS

PRONOTUM VARIABLE

NOTAULICES FROM ABSENT TO COMPLETE

WELL-DEVELOPED STIGMAL & POST-MARGINAL VEINS

SESSILE

OVIPOSITOR SHEATHS VERY SHORT OR USUALLY NOT VISIBLE



***Arthrolytus ocellus*** (Walker 1834) - PTEROMALIDAE

♀ X 5

**Impression:** VERY DARK HEAD & THORAX WITH COPPER TINTS; GASTER BRILLIANT COPPER WITH HINT OF PURPLE; METALLIC & ORANGE-BROWN LEGS; VERY DARK BRASSY ANTENNAE; CLOUDED FOREWING; NO VISIBLE OVIPOSITOR SHEATHS. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body **3.0mm** (2.5-3.3)

**Ratios:** Head + Thorax/Body 47%; Fl/Head + Thorax 52%; Wings/Body **57%**; Ovip/Body **0%**.

**Antennae:** 11(2R)63; black with brassy tints; colourless scape; long pedicel; pale sensillae; inserted level with bottom of eyes.

**Head:** very dark metallic; granular; colourless ocelli.

**Eyes:** large; red.

**Mouthparts:** brown mandibles & appendages.

**Thorax:** very dark with coppery tints; mesoscutum granular, with dark spines; very faint full-length notaulices below; tegulae pale neutral brown; scutellum granular with dark spines; mesepimeron with glossy top, heavily punctate.

**Legs:** hind coxae green; the rest orange-brown, with paler tarsi and dark claws; hind coxae not much longer than front pair.

**Wings:** dark cloud on forewing, below marginal & stigmal veins; dark veins & hairs; short marginal & very long post marginal veins; long stigmal forming a 30° acute angle to post-marginal vein.

**Gaster:** the first segment, and beneath the rest, dark testaceous; the remainder dark copper with purple tints; shiny; deep triangular from side.

**Ovipositor sheaths:** none visible.

♂ X 5

**Impression:** DARK METALLIC HEAD; DARK THORAX WITH GREEN & GOLD TINTS; TRANSLUCENT PALE & DARK GASTER; METALLIC & ORANGE-BROWN LEGS; BLACK ANTENNAE; CLOUDED FOREWING. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body **1.6mm** (1.1-1.9)

**Ratios:** Head + Thorax/Body 59%; Fl/Head + Thorax 58%; Wings/Body **60%**.

**Antennae:** 11(2R)63; black; dirty pale yellow-brown scape; long brown pedicel; pale sensillae; inserted level with bottom of eyes.

**Head:** very dark metallic; granular; pale red-tinged ocelli.

**Eyes:** large; red.

**Mouthparts:** brown mandibles & appendages.

**Thorax:** dark, with green & gold tints; mesoscutum granular, with dark spines; very faint full-length notaulices; tegulae pale neutral brown; scutellum granular with dark spines; mesepimeron with glossy top, heavily punctate below.

**Legs:** all coxae green, punctate; the rest orange-brown, with paler tarsi and dark claws; hind coxae not much longer than front pair.

**Wings:** smaller or larger dark cloud on forewing, below marginal & stigmal veins; dark veins & hairs; short marginal & very long post marginal veins; long stigmal forming a 30° acute angle to post-marginal vein.

**Gaster:** pale translucent basal area; the remainder dark; short, wide & flat.



***Caenacis lauta*** (Walker 1835) - PTEROMALIDAE

♀ X 2

**Impression:** DARKISH METALLIC GREEN HEAD & THORAX; DARK METALLIC GASTER; YELLOW-BROWN LEGS; BRASSY ANTENNAE; NO VISIBLE OVIPOSITOR SHEATHS. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body 2.6mm

**Ratios:** Head + Thorax/Body 48%; Flagellum/Head + Thorax 60%; Wing/Body 88%; Ovip/Body 0%.

**Antennae:** 11(2r)63; brassy-gold; long, dull yellow scape & pedicel; not clubbed; slight taper; shortish; decumbent, pale hairs.

**Head:** darkish metallic green; large, oval; lightly hairy; reticulated sculpture.

**Eyes:** neutral brown; largish, oval.

**Mouthparts:** mid gold-brown mandibles & appendages.

**Thorax:** fairly dark metallic green; heavily granulated; hairy; notaulices incomplete.

**Legs:** coxae & femora dark metallic green; the remainder rich beige-yellow, with some brown tinges on tibiae; dark claws; middle tibia & basitarsus not enlarged.

**Wings:** clear; pale veins and neutral hairs; heavy short marginal vein; longish stigmal vein with heavy stigma & long post-stigmal vein; in theory, there is no break between marginal & stigmal veins, but it may give this impression, as in *Hobbya*.

**Gaster:** metallic dark green tint; glossy; hairy at edges; triangular from side.

**Ovipositor sheaths:** not visible.

♂ X 3

**Impression:** DARKISH METALLIC GREEN HEAD & THORAX; BROWN GASTER; DARK TO YELLOW LEGS; BRASSY ANTENNAE. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body 2.5mm (2.1-3.0)

**Ratios:** Head + Thorax/Body 57%; Fl/Head + Thorax 48%; Wing/Body 87%.

**Antennae:** 11(2r)63. brassy; long, dull-yellow scape & pedicel; decumbent hairs; obvious segments; not clubbed or tapered.

**Head:** darkish metallic green; hairy; heavy but small; reticulated sculpture.

**Eyes:** largish; oval, dark neutral.

**Mouthparts:** mid to dark neutral brown appendages & mandibles.

**Thorax:** metallic green; glossy; small-sized reticulated sculpture; decumbent hairs; notaulices incomplete.

**Legs:** reticulated metallic coxae, with dark-brown & part-metallic femora; the rest dark beige-yellow, with dark claws; middle tibia & basitarsus not enlarged.

**Wings:** clear; pale veins and neutral hairs; heavy short marginal vein; longish stigmal vein with heavy stigma & long post-stigmal vein; in theory, no break between marginal & stigmal veins but may give this impression, as in *Hobbya*.

**Gaster:** brown; quite long; wide; shallow point from above; thin from side;.



***Cecidostiba fungosa*** (Geoffroy in Fourcroy 1785) - PTEROMALIDAE

♀ X 49

**Impression:** DARK OR BRIGHT METALLIC GREEN HEAD & THORAX, SOMETIMES WITH GOLD, BRONZE OR RED GLINTS; LARGELY BRONZE GASTER; CONTRASTING YELLOW & BROWN LEGS; BRASSY ANTENNAE; NO VISIBLE OVIPOSITOR SHEATHS. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body **2.6mm** (1.7-3.3)

**Ratios:** Head + Thorax/Body 47%; Fl/Head + Thorax 50%; Wings/Body **78%**; Ovip/Body **0%**.

**Antennae:** 11(2r)63; brassy, with darker at joints; long, translucent gold scape; flask-shaped, darker pedicel; flagellum lightly tapered, with enlarged club; conspicuous longitudinal sensillae & pale hairs.

**Head:** bright green metallic; reticulate sculpture, with black hairs; clypeus with notch; translucent pale brown ocelli.

**Eyes:** large, red-brown.

**Mouthparts:** tiny pale yellow appendages, with chestnut-tipped paler mandibles.

**Thorax:** bright metallic green; reticulated mesoscutum with black hairs; no notaulices; neutral brown tegulae; reticulated scutellum with 2 longitudinal lines of black bristles; glossy mesepimeron.

**Legs:** coxae reticulated metallic green, pale yellow contrasting trochanter/trochantellus; femora dark brown; tibiae & tarsi all pale yellow; with dark claws (*C. semifascia* always has darker dusting on upper tibia).

**Wings:** clear; long stigmal and post-marginal veins; stigma as wide as long, with small uncus; long hairs, veins pale neutral brown; no cloud; bare basal cell & speculum.

**Gaster:** metallic, bronze-green; glossy first segment without sculpture, the rest dark bronze with light transverse sculpture; triangular from side; long, sessile.

**Ovipositor sheaths:** none visible.

♂ X 46

**Impression:** DARK OR BRIGHT METALLIC GREEN HEAD & THORAX, SOMETIMES WITH GOLD, BRONZE OR RED GLINTS; DARK BROWN GASTER; BROWN & PALE YELLOW LEGS; BRASSY ANTENNAE. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body **1.9mm** (1.3-2.5)

**Ratios:** Head + Thorax/Body 58%; Fl/Head + Thorax 56%; Wings/Body **82%**.

**Antennae:** 11(2r)63; brassy, darker at joints; long, translucent gold scape; flask-shaped, darker pedicel; flagellum lightly tapered, with enlarged club; conspicuous longitudinal sensillae & pale hairs.

**Head:** bright green metallic; reticulate sculpture, with black hairs; clypeus with notch; translucent golden-brown ocelli.

**Eyes:** large, brown.

**Mouthparts:** pale yellow appendages, chestnut-tipped glossy mandibles.

**Thorax:** bright metallic green; reticulated mesoscutum with black hairs; no notaulices; tegulae neutral brown; reticulated scutellum with 2 lines of black bristles longitudinally; glossy mesepimeron.

**Legs:** coxae reticulated metallic green, pale yellow contrasting trochanter/trochantellus; femora brown; tibiae & tarsi all pale yellow, with dark claws (*C. semifascia* always has darker dusting on upper tibia).

**Wings:** clear; pale neutral-brown hairs & veins; long stigmal and post-marginal veins; stigma as wide as long, with small uncus; no cloud; bare basal cell & speculum.

**Gaster:** dark green, glossy 1<sup>st</sup> segment; rest dark brown; sparse hairs; mid-width, shallow; sessile.



***Cecidostiba geganius*** (Walker 1848) - PTEROMALIDAE

♀ X 2

**Impression:** DARK GREENY-BRONZE BODY WITH PURPLE TINTS; TESTACEOUS LEGS; DARK BRASSY ANTENNAE; CONSPICUOUS BROWN CLOUD ON MID-WING; NO VISIBLE OVIPOSITOR SHEATHS. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body 3.0mm

**Ratios:** Head + Thorax/Body 48%; Fl/Head + Thorax 41%; Wings/Body 68%; Ovip/Body 0%.

**Antennae:** 11(2r)63; dark brassy; long, pale yellow scape; long thin brown pedicel which is longer than 3rd segment; remainder of funicle with segments as wide as long; heavy; pale setae;

**Head:** dark green-bronze, reticulated; cheeks with striae part way up, clypeus with notch; translucent, colourless ocelli.

**Eyes:** medium; red with dark edges.

**Mouthparts:** chestnut mandibles; dark appendages tinted green.

**Thorax:** dark green-bronze; reticulated mesoscutum; notaulices incomplete; tegulae testaceous; scutellum reticulated.

**Legs:** metallic dark bronze-green coxae, the rest translucent testaceous; claws darkened.

**Wings:** clear, with large brown cloud on disc; testaceous veins and hairs; lower third of discal cell hairy; small stigma largely hidden in cloud; long stigmal and post-marginal veins.

**Gaster:** green/bronze, with purple tints; segmented; fine cross sculpture; triangular from side.

**Ovipositor sheaths:** not visible.

♂ X 3

**Impression:** DARK GREENY-BRONZE HEAD; BRONZE THORAX & GASTER; BROWN & YELLOW LEGS; YELLOW-BROWN ANTENNAE. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body 1.6mm (1.6-1.7)

**Ratios:** Head + Thorax/Body 57%; Fl/Head + Thorax 45%; Wings/Body 76%.

**Antennae:** 11(2r)63; funicle & club yellow-brown; long, thin yellow scape; oval, swollen mid-yellow pedicel; funicle segments square.

**Head:** leathery sculpture, wide, bronze/green.

**Eyes:** neutral brown.

**Mouthparts:** mandibles dark & inconspicuous; appendages dark, tinted with green

**Thorax:** bronze; leathery sculpture, wide, notaulices incomplete.

**Legs:** tapering from dark brown coxae to pale yellow tibiae and tarsi; middle tibia & basitarsus not enlarged.

**Wings:** long stigmal and post-marginal veins; mid-brown veins and hairs; no break between marginal & stigmal veins (not as in *Hobbya*).

**Gaster:** bronze, longish, wide and pointed; smooth, with inconspicuous bands of hairs on segments.



*Cecidostiba semifascia* (Walker 1835) - PTEROMALIDAE

♀ X 24

**Impression:** BRIGHT METALLIC GREEN HEAD & THORAX WITH MORE OR LESS EXTENSIVE GOLD TINTS; BRONZE-GREEN GASTER; LEGS TAPERED FROM DARK TO LIGHT; BRASSY ANTENNAE; OVIPOSITOR SHEATHS NOT VISIBLE. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body 2.6mm (1.7-3.3)

**Ratios:** Head + Thorax/Body 44%; Fl/Head + Thorax 52%; Wings/Body 78%; Ovip/Body 0%.

**Antennae:** 11(2r)63; brassy, darker at joints; long, translucent gold scape; flask-shaped, darker pedicel, no club or taper; conspicuous longitudinal sensillae & pale, decumbent hairs..

**Head:** bright metallic green, with gold tints; no central notch in clypeus, which has reticulate sculpture among the striae; red-brown ocelli.

**Eyes:** large, yellow -brown.

**Mouthparts:** tiny yellow palps, with brown mandibles.

**Thorax:** bright metallic green, with gold tints; mesoscutum finely reticulated, with black hairs; no notaulices; dark brown, glossy tegulae; scutellum reticulated, with a double line of inward-facing black spines; mesepimeron glossy, with faint traces of sculpting.

**Legs:** metallic reticulated green coxae; dark femora, but yellow contrasting trochanter/trochantellus; yellow tibiae with darkened top half (*C. fungosa* all yellow); yellow tarsi.

**Wings:** clear with more or less pale brown cloud behind stigma (often not visible); dark veins and brown hairs; bare basal cell and speculum; long stigmal and post-marginal veins; stigma longer than wide

**Gaster:** first segment glossy dark metallic green; the remainder dark bronze/purple; triangular from side.

**Ovipositor sheaths:** none visible.

♂ X 16

**Impression:** DARK METALLIC GREEN HEAD & THORAX, WITH EXTENSIVE GOLD TINTS; DARK GASTER; LEGS TAPERED FROM DARK TO LIGHT; BRASSY ANTENNAE. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body 1.7mm (1.2-2.5)

**Ratios:** Head + Thorax/Body 58%; Fl/Head + Thorax 57%; Wings/Body 89%.

**Antennae:** 11(2r)63; brassy, darker at joints; long, translucent gold scape; flask-shaped, darker pedicel; no club or taper; conspicuous longitudinal sensillae & pale, decumbent hairs.

**Head:** dark metallic green, with gold tints; no central notch in clypeus, which has reticulate sculpture among the striae; large red-brown ocelli.

**Eyes:** very dark neutral brown, large; with paler ring round circumference.

**Mouthparts:** rich brown mandibles; rich yellow appendages.

**Thorax:** dark metallic green, with gold tints; mesothorax finely reticulated, with black hairs; no notaulices; dark brown glossy tegulae; scutellum reticulated, with a double line of black inward-facing spines; mesepimeron glossy, with faint traces of sculpting.

**Legs:** metallic reticulated green coxae; dark femora, but yellow contrasting trochanter/trochantellus; yellow tibiae with darkened top half (*C. fungosa* all yellow); yellow tarsi.

**Wings:** clear, with more or less pale brown cloud behind stigma (not always visible); dark veins and brown hairs; long stigmal and very long post-marginal veins; stigma longer than wide; basal cell bare.

**Gaster:** very dark bronze-brown with green tint on glossy first segment; other segments with fine transverse sculpting; long & thin from side.



***Hobbya stenonota*** (Ratzeburg 1848) - PTEROMALIDAE

♀ X 47

**Impression:** DARK METALLIC GREEN HEAD & THORAX, DARK BRONZE-GREEN GASTER; DARK TO YELLOW LEGS; BRASSY ANTENNAE; NO VISIBLE OVIPOSITOR SHEATHS. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body 2.1mm (1.5-2.9)

**Ratios:** Head+Thorax/Body 52%; Flagellum/Head+Thorax 37%; Wing/Body 88%; Ovip/Body 0%.

**Antennae:** 11(2r)63; brassy; pedicel dark & fat; long dull-yellow scape set deep in head; stout, short & tapered; transverse funicular segments; dark sensillae; pale, short decumbent hairs.

**Head:** over-sized; dark metallic gold-green; fanned striae radiating out to face & cheeks; patterned with small reticulations; hairy; dark brown ocelli.

**Eyes:** largish, dark-neutral, toning in.

**Mouthparts:** rich mid-brown mandibles and appendages.

**Thorax:** very dark metallic green, hairy; mesoscutum reticulated; notaulices incomplete; dark straw tegulae; reticulated scutellum; reticulated mesepimeron.

**Legs:** metallic reticulated coxa & femur, with yellow contrasting trochanter; rest pale translucent yellow, with dark claws; middle tibia & basitarsus not enlarged.

**Wings:** clear; mid-neutral brown veins and neutral hairs; longish stigmal vein with visible, sharp stigma; transparent; wide marginal vein with difficult-to-see slight break (or clear part) between sub-marginal/marginal veins.

**Gaster:** first segment dark polished metallic green; the rest dark coppery bronze with some faint microsculpture; hairy at edges and in bands across; heavily triangular from side, narrow but high.

**Ovipositor sheaths:** not visible.

♂ X 24

**Impression:** GREEN/BRONZE HEAD & THORAX; GOLDEN-BRONZE GASTER; METALLIC, BROWN & DIRTY YELLOW LEGS; BRASSY ANTENNAE;. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body 1.8mm (1.5-2.2)

**Ratios:** Head+Thorax/Body 56%; Fl/Head+Thorax 41%; Wing/Body 86%.

**Antennae:** 11(2r)63; brassy; darker pedicel & dull-yellow scape sunk deep into head hairy; lightly tapered; longer than ♀; sensillae.

**Head:** over-sized, dark metallic bronzy-green; reticulated; hairy; fanned striae radiating out to face & cheeks; patterned with small reticulations; large pale ocelli.

**Eyes:** largish, neutral-brown, dark and toning in.

**Mouthparts:** red-brown mandibles with small dark-gold appendages.

**Thorax:** metallic bronzy-green; hairy; mesoscutum reticulated; notaulices incomplete & barely visible; dark neutral-brown tegulae; reticulated scutellum; reticulated mesepimeron.

**Legs:** metallic reticulated dark green coxa and dark brown femur tinged with metallic; the remainder beige-yellow, with darker claws; yellow trochanter and joints; middle tibia & basitarsus not enlarged.

**Wings:** clear; pale veins and neutral hairs on transparent; wide marginal vein; longish stigmal vein with visible sharp stigma; slight break (or clear section - almost invisible) between sub-marginal/marginal veins.

**Gaster:** golden-bronze, shiny, hairy; pointed from above; very thin from side; appears tiny.





**Mesopolobus albitarsus** (Walker 1834) - PTEROMALIDAE

♀ X 4

**Impression:** DARK METALLIC BLUE-GREEN HEAD & THORAX; BRONZE-GREEN GASTER; FROM DARK TO PALE LEGS; LIGHT BROWN ANTENNAE; OVIPOSITOR SHEATHS NOT VISIBLE. THREE ring, FIVE funicular & FIVE tarsal segments.

**Length:** Body **2.2mm** (2.0-2.3)

**Ratios:** Head+Thorax/Body 47%; Fl/Head+Thorax 53%; Wings/Body 81%; Ovip/Body 0%.

**Antennae:** 11(3r)53; translucent pale brown, with dark joints; long tapered pedicel & scape; stoutish; short hair rings.

**Head:** deep metallic green, with bronze tints; reticulated, alutaceous in parts; short, pale hairs; cream central edge of clypeus; clear pale ocelli.

**Eyes:** small, mid-brown.

**Mouthparts:** chestnut mandibles with inconspicuous pale appendages.

**Thorax:** dark metallic green, with blue and other tints; mesoscutum blue-green, reticulated with sparse hairs on edges; notaulices faint & incomplete; black tegulae; scutellum dark neutral with small reticulations and some hair; mesepimeron smooth and glossy.

**Legs:** dark coxae & femora; brown tibiae; pale tarsi with dark feet.

**Wings:** translucent; with pale brown veins and hairs; long post-stigmal and stigmal veins.

**Gaster:** dark bronze-green; wide and deep with pointed end; light leathery microsculpture.

**Ovipositor sheaths:** not visible.

♂ X 4

**Impression:** VERY DARK METALLIC HEAD & THORAX, WITH GREEN, BLUE OR VIOLET TINTS; BRONZE-BROWN GASTER; DARK LEGS; GOLD ANTENNAE. THREE ring, FIVE funicular & FIVE tarsal segments.

**Length:** Body **1.7mm** (1.1-2.3)

**Ratios:** Head+Thorax/Body 55%; Fl/Head+Thorax 55%; Wings/Body 88%.

**Antennae:** 11(3r)53; gold, with darker rings by joints; long yellow scape; slight taper.

**Head:** deep blue, or greenish-blue to violet-black metallic; reticulated; brown ocelli.

**Eyes:** large, dark neutral brown.

**Mouthparts:** yellow appendages & mandibles.

**Thorax:** very deep metallic blue, or greenish-blue to violet-black; mesoscutum reticulated; faint incomplete notaulices; mid neutral brown tegulae; reticulated scutellum; mesepimeron with glossy top, reticulated below.

**Legs:** femora mainly black, tibia dark; enlarged middle tibia.

**Wings:** clear; pale veins and hairs; short marginal, long post marginal veins; long clubbed stigmal vein.

**Gaster:** bronze-brown with long white bands of hairs on segment edges.



**Mesopolobus amaenus** (Walker 1834) - PTEROMALIDAE

♀ X 10

**Impression:** METALLIC GREEN BODY WITH GOLDEN-RED TINGES; DARK TO YELLOW LEGS; GOLDEN-BROWN ANTENNAE; NO VISIBLE OVIPOSITOR SHEATHS;. THREE ring, FIVE funicular & FIVE tarsal segments.

**Length:** Body 2.6mm (2.3-2.8)

**Ratios:** Head + Thorax/Body 53%; Flagellum/Head + Thorax 42%; Wing/Body 100%; Ovip/Body 0%.

**Antennae:** 11(3r)53; brown blending into golden segments towards the club, which is the lightest part; bright dark yellow scape & pedicel; heavily tapering smoothly into club.

**Head:** bright metallic gold-green; reticulated; largely hairless; clypeus lightly notched at centre of margin; pale red ocelli.

**Eyes:** red-brown, moderately large,.

**Mouthparts:** small, dark gold appendages; chestnut-tipped gold mandibles.

**Thorax:** bright metallic green; largely hairless; pronotal collar with very large reticulation; mesoscutum reticulate; notaulices incomplete; pale yellow tegulae; scutellum reticulate.

**Legs:** coarsely reticulate metallic green coxae, with brown femora; otherwise yellow, with dark claws and bottom joints of tarsi.

**Wings:** clear; neutral hairs and veins; long pale stigmal vein.

**Gaster:** glossy, metallic gold-green; bands of long hairs towards rear and on sides.

**Ovipositor sheaths:** not visible.

♂ X 4

**Impression:** BRIGHT METALLIC GREEN HEAD & THORAX, WITH OR WITHOUT GOLDEN-RED TINGES; DARK BROWN GASTER WITH MORE OR LESS TESTACEOUS/YELLOW; PALE YELLOW LEGS; DARK-BANDED ORANGE-GOLD ANTENNAE. THREE ring, FIVE funicular & FIVE tarsal segments.

**Length:** Body 2.0mm (1.8-2.2)

**Ratios:** Head + Thorax/Body 64%; Fl/Head + Thorax 43%; Wing/Body 103%.

**Antennae:** 11(3r)53; striking orange-gold, with funicle segments 3 & last two of club dark; long, fat, orange scape; smaller pedicel.

**Head:** bright metallic green, reticulated, some hairs; slightly notched clypeus with carina fanning out over face; red-brown ocelli.

**Eyes:** large, red-brown.

**Mouthparts:** yellow mandibles with dark tips; yellow appendages.

**Thorax:** bright metallic green; largely hairless; pronotal collar with very large reticulation; mesoscutum reticulate; notaulices incomplete; pale yellow tegulae; scutellum reticulate;.

**Legs:** pale bright yellow, with coarsely reticulate metallic green coxae; enlarged middle tibia.

**Wings:** clear; neutral hairs and veins; long, pale stigmal vein.

**Gaster:** first segment dark metallic glossy green; the remainder dark brown-bronze with a variable amount of translucent dirty yellow just behind the first segment; this can vary from a vague central spot to a narrow, ill-defined band; bands of hair towards back and on sides; slender from side.



**Mesopolobus dubius** (Walker 1834) - PTEROMALIDAE

♀ X 7

**Impression:** DARK GREEN-BRONZE METALLIC HEAD & THORAX; GREEN & BROWN GASTER; DARK TO YELLOW LEGS; BRASSY ANTENNAE; NO VISIBLE OVIPOSITOR SHEATHS. THREE ring, FIVE funicular & FIVE tarsal segments.

**Length:** Body 2.1mm (1.9-2.5)

**Ratios:** Head+Thorax/Body 55%; Fl/Head+Thorax 38%; Wings/Body 85%; Ovip/Body 0%.

**Antennae:** 11(3r)53; brassy with darker club; long deep yellow scape; long pedicel; ring & funicle segments difficult to count; tapered.

**Head:** very dark metallic green/bronze, wide and heavy; heavily reticulated; red-brown ocelli.

**Eyes:** dark brown, with paler rim.

**Mouthparts:** very dark appendages; chestnut-tipped, dark mandibles.

**Thorax:** dark metallic green-bronze, with some golden tints; reticulated mesoscutum; no notaulices; testaceous tegulae; reticulated scutellum; reticulated mesepimeron.

**Legs:** metallic coxae; the remainder mid brown-yellow.

**Wings:** clear; pale-yellow veins and hairs; long stigmal and post marginal veins;

**Gaster:** green/golden/brown metallic; glossy; wide & flat.

**Ovipositor sheaths:** not visible.

♂ X 5

**Impression:** BRIGHT METALLIC GREEN HEAD & THORAX; BANDED GASTER IN METALLIC GREEN, YELLOW & BROWN; YELLOW LEGS; YELLOW ANTENNAE WITH BROWN BANDS. THREE ring, FIVE funicular & FIVE tarsal segments.

**Length:** Body 1.7mm (1.4-1.8)

**Ratios:** Head+Thorax/Body 60%; Fl/Head+Thorax 46%; Wings/Body 93%.

**Antennae:** 11(3r)53; pale yellow, very pale yellow scape and long brown pedicel; club, & funicular segments 2 & 3, brown; tapering.

**Head:** metallic green/bronze; reticulated; wide and heavy.

**Eyes:** neutral brown.

**Mouthparts:** mid yellow appendages & darker brown mandibles.

**Thorax:** metallic green; reticulated mesoscutum; no notaulices; testaceous tegulae; reticulated scutellum; reticulated mesepimeron.

**Legs:** metallic coxae; the remainder pale yellow, with dark tips to tarsi; enlarged middle tibia.

**Wings:** clear; mid-yellow veins and hairs; long stigmal and post marginal veins; small stigma;

**Gaster:** metallic green at front, a yellow band across middle and brown rear half; wide above, narrow from side.



Mesopolobus fasciiventris Westwood 1833 - PTEROMALIDAE

♀ X 9

**Impression:** BRILLIANT GOLDEN-GREEN, GREEN OR BLUE/GREEN BODY; PALE YELLOW LEGS; YELLOW-BROWN ANTENNAE; OVIPOSITOR SHEATHS NOT VISIBLE. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body 2.6mm (2.2-3.7)

**Ratios:** Head + Thorax/Body 51%; Fl/Head + Thorax 42%; Wings/Body 90%; Ovip/Body 0%.

**Antennae:** 11(2r)63; yellow-brown; long yellow scape; long dark pedicel; funicular segments 5 & 6 darker brown; club paler yellow-brown; slender.

**Head:** bright green metallic; hairy; reticulate; clypeus with small incision on margin; very pale red ocelli.

**Eyes:** red-brown.

**Mouthparts:** mid-yellow mandible with small chestnut tip; slender pale yellow appendages.

**Thorax:** bright green or blue-green metallic; hairy; mesoscutum reticulate; notaulices incomplete; dark testaceous tegulae; scutellum reticulate; mesepimeron with glossy top, reticulate below.

**Legs:** reticulated metallic coxae; the remainder bright pale yellow.

**Wings:** clear; mid-coloured veins and hairs; long stigmal and post-marginal veins.

**Gaster:** brilliant blue/green; pointed, with bands of pale hairs at segment edges; longer than head + thorax.

**Ovipositor sheaths:** not visible.

♂ X 11

**Impression:** BRILLIANT GREEN HEAD & THORAX WITH OR WITHOUT BLUE OR GOLD TINTS; YELLOW & BROWN BANDED GASTER; BRIGHT PALE YELLOW LEGS & ANTENNAE. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body 1.8mm (1.4-2.4)

**Ratios:** Head + Thorax/Body 63%; Fl/Head + Thorax 36%; Wings/Body 94%.

**Antennae:** 11(2r)63; bright yellow.

**Head:** bright green metallic, hairy; reticulated; red-brown ocelli.

**Eyes:** red-brown.

**Mouthparts:** yellow appendages; darker mandible with chestnut tip.

**Thorax:** bright green metallic with blue tints; hairy; reticulated mesoscutum; notaulices incomplete; pale yellow tegulae; reticulated scutellum; mesepimeron with glossy top, reticulated below.

**legs:** reticulated metallic coxae, the remainder glowing pale yellow; middle tibia with triangular dark projection at end, highly visible (fig 1); brown marks near joints of all tibiae.

**Wings:** long stigmal and post-marginal veins; mid-coloured veins and hairs.

**Gaster:** metallic green front with a narrow band of yellow and last half brown, not as definite as the shuttle-mark on *M. sericeus* (fig 2); yellow tone carries on round and below.

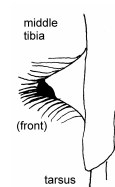


Fig 1



Fig 2



***Mesopolobus fuscipes*** (Walker 1834) - PTEROMALIDAE

♀ X 9

**Impression:** DARK METALLIC GREEN-GOLD HEAD AND THORAX; DARK GREEN-BROWN GASTER; DARK LEGS; MID-BROWN ANTENNAE; NO VISIBLE OVIPOSITOR SHEATHS. THREE ring, FIVE funicular & FIVE tarsal segments.

**Length:** Body **2.3mm** (1.8-2.7)

**Ratios:** Head+Thorax/Body 52%; Fl/Head+Thorax 38%; Wings/Body **92%**; Ovip/Body **0%**.

**Antennae:** 11(3r)53; mid-brown throughout; tapering to club.

**Head:** dark metallic green with gold tints; reticulated; red-brown ocelli.

**Eyes:** medium sized, red-brown; .

**Mouthparts:** chestnut-tipped darker mandibles; small pale yellow appendages.

**Thorax:** metallic dark green-brown with gold tints; mesoscutum reticulated; notaulices incomplete; tegulae neutral-brown; scutellum reticulate; upper part of mesepimeron shiny, the rest reticulate.

**Legs:** metallic coxae; characteristic wide, flat, dark brown rear femora; the rest dull brown and normal shape.

**Wings:** clear; yellow veins and hairs; long stigmal and post-marginal veins.

**Gaster:** dark green-brown metallic; wide and shiny.

**Ovipositor sheaths:** not visible.

♂ X 11

**Impression:** BRILLIANT GREEN & RED-GOLD HEAD AND THORAX; YELLOW BANDED BROWN GASTER; YELLOW LEGS; YELLOW ANTENNAE WITH DARK CLUB. THREE ring, FIVE funicular or TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body **1.8mm** (1.4-2.1)

**Ratios:** Head+Thorax/Body 59%; Fl/Head+Thorax 49%; Wings/Body **103%**.

**Antennae:** 11(3r)53 or 11(2r)63; yellow with first & third funicular segments brown; fat yellow-marked dark brown club, long fat yellow scape; tapered funicle; segments 6/8 transverse.

**Head:** red-gold tinted with metallic green; reticulated/coriaceous sculpture; dark red-brown ocelli.

**Eyes:** red-brown, mid-sized.

**Mouthparts:** chestnut mandibles; small neutral yellow appendages.

**Thorax:** brilliant metallic red-gold and green; mesoscutum reticulate; notaulices incomplete; tegulae pale yellow; scutellum reticulate; upper part of mesepimeron shiny, the rest reticulate.

**Legs:** metallic coxae, the rest rich yellow; fat tibiae with touch of orange longitudinally (*not always visible*); middle tibia flat and wide, with great curve on one side and orange longitudinal marks.

**Wings:** clear; yellow to pale neutral veins and hairs; long stigmal and post-marginal veins.

**Gaster:** brown, with narrow yellow band across first part, fading to rear.



*Mesopolobus sericeus* (=jucundus) (Forster 1770) -

PTEROMALIDAE

♀ X 52

**Impression:** METALLIC GREEN BODY WITH SOME GOLD HINTS; LARGELY YELLOW LEGS; BRASSY-OLIVE ANTENNAE; NO VISIBLE OVIPOSITOR SHEATHS. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body **3.1 mm** (2.2-4.0)

**Ratios:** Head + Thorax/Body 47%; Flagellum/Head + Thorax 45%; Wing/Body **88%**; Ovip/Body **0%**.

**Antennae:** 11(2r)63; brassy-olive with darker joints; long deep yellow scape & pedicel; lemon-yellow hairs; tapered to slight but definite club; longitudinal sensillae.

**Head:** bright metallic green, reticulated; clypeus with large marginal notch in centre; small dark brown ocelli.

**Eyes:** bright red, with regular lattice of darker patches inside.

**Mouthparts:** small yellow to mid-brown appendages; darker or paler chestnut-tipped mandibles.

**Thorax:** bright metallic green; propodeum with large reticulation; mesoscutum covered in smaller reticulation; notaulices three-quarters length from front; pale yellow tegulae; small reticulation all over scutellum; mesepimeron heavily sculpted, except for very top.

**Legs:** reticulated metallic green coxae; more or less brown on pale femora; the remainder smooth yellow; dark claws like socks.

**Wings:** clear; pale veins and neutral hairs; longish stigmal and post-marginal veins; bare basal cell.

**Gaster:** from glossy metallic green-bronze to brilliant gold; triangular from side, with long point.

**Ovipositor sheaths:** not visible.

♂ X 49

**Impression:** BRILLIANT METALLIC BLUE, BRONZE, GOLD AND GREEN HEAD & THORAX; BROWN GASTER WITH YELLOW SHUTTLE-MARK; BRIGHT PALE YELLOW LEGS & ANTENNAE. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body **2.1 mm** (1.4-3.0)

**Ratios:** Head + Thorax/Body 58%; Fl/Head + Thorax 45%; Wing/Body **97%**.

**Antennae:** 11(2r)63; bright palest yellow, with some tiny dark-brown spots; angled funicular segments; distinctive hooked tip to club; tapering.

**head:** green /red metallic; reticulated; hairless; small red ocelli.

**eyes:** red.

**mouthparts:** large pale yellow appendages; pale yellow/brown chestnut-tipped mandibles.

**thorax:** punctate metallic, green, purple and blue, or golden-green; hairless except at side and rear; pronotum reticulate; mesoscutum reticulate; notaulices incomplete; pale yellow tegulae; scutellum reticulate; mesepimeron reticulate.

**legs:** reticulated metallic coxae; the rest bright palest yellow;

**wings:** clear; pale hairs & veins; bare basal cell; long stigmal vein.

**gaster:** brown-bronze; largely hairless; with distinctive yellow shuttle-mark on top (fig 1).



Fig 1



***Mesopolobus tibialis*** (Westwood 1833) - PTEROMALIDAE

♀ X 13

**Impression:** BRONZE-TINTED GREEN HEAD & THORAX; METALLIC BRONZE-GREEN GASTER; YELLOW LEGS; YELLOW-BROWN ANTENNAE; OVIPOSITOR SHEATHS NOT VISIBLE. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body **2.3mm** (1.7-3.1)

**Ratios:** Head+Thorax/Body 54%; Fl/Head+Thorax 43%; Wings/Body **89%**; Ovip/Body **0%**.

**Antennae:** 11(2r)63; brown/yellow with paler club; long yellow scape; long yellow pedicel; tapered.

**Head:** bronze-tinted green metallic; large & wide; reticulate; small red-brown ocelli.

**Eyes:** red-brown.

**Mouthparts:** chestnut-tipped mandibles; small, yellow appendages.

**Thorax:** metallic bronze-tinted green; pronotum reticulate; mesoscutum reticulate; no real trace of notaulices; tegulae translucent yellow with brown mark; scutellum reticulate; mesepimeron reticulate.

**Legs:** mid-yellow, with veined, fatter femur and darker claws; rear tibiae are wide and flat, with longitudinal red lines.

**Wings:** clear; pale yellow veins and hairs; long post-marginal and longish stigmal veins.

**Gaster:** dark bronze-green metallic; pointed; glossy.

**Ovipositor sheaths:** not visible.

♂ X 28

**Impression:** BRIGHT METALLIC GREEN HEAD; BRONZE THORAX; BRONZE, YELLOW & GREEN GASTER; YELLOW LEGS; GOLD & BROWN ANTENNAE. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body **1.7mm** (1.5-2.0)

**Ratios:** Head+Thorax/Body 60%; Fl/Head+Thorax 49%; Wings/Body **94%**.

**Antennae:** 11(2r)63; golden, with dark club; long, pale lemon, banana-shaped scape; small yellow pedicel; slender; slightly tapered; hairy.

**Head:** metallic green, green-gold or tinged with red, reticulate; wide; pale red ocelli.

**Eyes:** red-brown, large.

**Mouthparts:** yellow appendages; darker-tipped mandibles.

**Thorax:** green-gold metallic; pronotum reticulate; mesoscutum reticulate; faint impression of notaulices at front; testaceous tegulae; scutellum reticulate; glossy top to mesepimeron, the bottom reticulate.

**Legs:** mid-yellow, with red-veined fatter femur; darker claws; rear tibiae are wide and flat, with red lines longitudinally; enlarged middle tibia, with black mark at apex.

**Wings:** pale yellow veins and hairs; long post-marginal and longish stigmal veins.

**Gaster:** dark metallic bronze-green at base, then yellow fading into brownly-bronze; (some have appearance of *M. sericeus* shuttle-mark, but very vague in outline and not always present); glossy.



*Mesopolobus xanthocerus* (Thomson 1878) - PTEROMALIDAE

♀ X 9

*Impression:* METALLIC GOLDEN-GREEN HEAD & THORAX; GASTER GREEN-SHOT DARK BRONZE; YELLOW-BROWN LEGS; DEEP YELLOW ANTENNAE; NO VISIBLE OVIPOSITOR SHEATHS. THREE ring, FIVE funicular & FIVE tarsal segments.

*Length:* Body 2.1mm (1.9-2.5)

*Ratios:* Head + Thorax/Body 53%; Fl/Head + Thorax 42%; Wings/Body 98%; Ovip/Body 0%.

*Antennae:* 11(3r)53; brassy yellow; long pale yellow scape & pedicel; distinctly tapered.

*Head:* dull golden-green metallic; reticulated; tiny brown ocelli.

*Eyes:* medium-large, dull red-brown.

*Mouthparts:* tiny pale yellow appendages; darker mandibles with chestnut tips.

*Thorax:* dull golden-green metallic; mesoscutum reticulate; narrow half-length notaulices; dull straw tegulae; scutellum reticulate; upper part of mesepimeron shiny, the rest reticulate.

*Legs:* reticulated metallic coxa; large, brown femur tapering to paler below; dark claws.

*Wings:* clear; pale yellow veins and hairs; longish stigmal and post-marginal veins.

*Gaster:* deep green-shot dark bronze; shiny first segment with light sculpture on remainder; pointed.

*Ovipositor sheaths:* none visible.

♂ X 8

*Impression:* BRIGHT GREEN METALLIC HEAD & THORAX; YELLOW-BANDED METALLIC GASTER: DARK TO YELLOW LEGS WITH ENLARGED MIDDLE TIBIAE; YELLOW-BROWN & DARK ANTENNAE; NO VISIBLE OVIPOSITOR. THREE ring, FIVE funicular & FIVE tarsal segments.

*Length:* Body 1.7mm (1.5-1.8)

*Ratios:* Head + Thorax/Body 58%; Fl/Head + Thorax 48%; Wings/Body 98%.

*Antennae:* 11(3r)53; deep yellow/brown with dark club; long pale yellow scape & pedicel; tapered.

*Head:* bright green metallic, reticulate.

*Eyes:* neutral-brown.

*Mouthparts:* tiny pale yellow appendages; darker mandibles with chestnut tips.

*Thorax:* bright green metallic; mesoscutum reticulate; notaulices incomplete; dull straw tegulae; scutellum reticulate; upper part of mesepimeron shiny, the rest reticulate.

*Legs:* metallic coxa; large, brown femur tapering to paler below; dark claws; enlarged middle tibia, with black process on outside edge near apex.

*Wings:* very pale veins and hairs; longish stigmal and post-marginal veins.

*Gaster:* yellow band across middle of metallic top; broad above, thin from side;





**Ormocerus latus** Walker 1834 - PTEROMALIDAE

♀ X 3

**Impression:** METALLIC DARK GOLD-GREEN HEAD & THORAX; GREEN & BRONZE GASTER; METALLIC GREEN LEGS; METALLIC ANTENNAE; OVIPOSITOR SHEATHS NOT VISIBLE. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body **1.8mm** (1.7-1.9)

**Ratios:** Head + Thorax/Body 58%; Fl/Head + Thorax 36%; Wings/Body **95%**; Ovip/Body **0%**.

**Antennae:** 11(2r)63; metallic dark bronze-gold; clubbed; hairy; transverse funicular segments.

**Head:** metallic green and gold; sculpted; white hairs.

**Eyes:** large brown.

**Mouthparts:** yellow.

**Thorax:** metallic green and gold; sculpted, with long, sparse white hairs; full-length notaulices.

**Legs:** metallic green; brown tarsi; distinctive yellow joints.

**Wings:** clear; dark yellow hairs and veins; long stigmal and very long post-marginal veins.

**Gaster:** green & bronze-gold metallic; striking white hairs; some microsculpture.

**Ovipositor sheaths:** not visible.

♂ X 3

**Impression:** DARK BRONZE HEAD; DARK METALLIC GREEN THORAX; BRONZE-GREEN GASTER; METALLIC LEGS; BRONZE ANTENNAE. TWO ring, SIX funicular & FIVE TARSAL segments.

**Length:** Body **1.4mm** (1.3-1.5)

**Ratios:** Head + Thorax/Body 69%; Fl/Head + Thorax 40%; Wings/Body **112%**.

**Antennae:** 11(2r)63; dark bronze metallic; thick metallic green scape & pedicel; transverse funicular segments; slender; not clubbed.

**Head:** dark bronze metallic with bright green hints; sculpted.

**Eyes:** dark brown & large.

**Mouthparts:** small dark appendages and dark mandibles.

**Thorax:** dark green, with bright metallic tints; full-length notaulices.

**Legs:** all metallic green, except for yellow/brown joints and some tarsi.

**Wings:** clear; pale hairs & veins; long, curved stigmal vein.

**Gaster:** dark bronze-green with bright metallic tints; wide & low.



*Ormocerus vernalis* Walker 1834 - PTEROMALIDAE

♀ X 7

**Impression:** GREEN METALLIC HEAD; BLUE-GREEN THORAX; DARK METALLIC GREEN GASTER; METALLIC & DARK LEGS; DARK & METALLIC GREEN ANTENNAE; OVIPOSITOR SHEATHS NOT VISIBLE. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body 2.3mm (2.2-2.5)

**Ratios:** Head + Thorax/Body 49%; Fl/Head + Thorax 38%; Wings/Body 85%; Ovip/Body 0%.

**Antennae:** 11(2r)63; dark, with heavy club; metallic green scape & pedicel; hairy; transverse funicular segments.

**Head:** green metallic.

**Eyes:** dark brown.

**Mouthparts:** dark brown appendages & mandibles.

**Thorax:** blue/green metallic; full-length notaulices.

**Legs:** metallic green legs, except for dark brown tarsi, but no pale joints.

**Wings:** clear, with faint fascial cloud below marginal vein; brown hairs and veins; fat stigmal vein and stigma; long post-marginal.

**Gaster:** dark, pointed, metallic green; sparse, dark hairs.

**Ovipositor sheaths:** not visible.

♂ X 3

**Impression:** METALLIC GREEN HEAD; BLUE-GREEN THORAX; DARK METALLIC BLUE GASTER; LARGELY METALLIC LEGS; DARK ANTENNAE. TWO ring, SIX funicular & FIVE tarsal segments.

**Length:** Body 1.5mm (1.5-1.6)

**Ratios:** Head + Thorax/Body 65%; Fl/Head + Thorax 38%; Wings/Body 103%.

**Antennae:** 11(2r)63; dark; heavy club; very hairy; transverse funicular segments.

**Head:** green metallic.

**Eyes:** dark brown.

**Mouthparts:** mid-brown appendages & mandibles.

**Thorax:** thorax: blue-green metallic; full-length notaulices.

**Legs:** metallic green legs, except for dark brown tarsi; no pale joints.

**Wings:** clear, with faint fascial cloud below marginal vein; brown hairs and veins; fat stigmal vein & stigma; long post-marginal vein.

**Gaster:** dark metallic blue-green; short & wide; narrow from side.



## Common factors for Eupelmidae in this section

DARK METALLIC GREEN -

FIVE TARSAL SEGMENTS

ONE RING & SEVEN FUNICULAR SEGMENTS

SHORT, POINTED PRONOTUM

COMPLETE NOTAULICES

SESSILE

SHORT, BANDED OVIPOSITOR



♀  
typical shapes (not to scale)



♂



*Eupelmus annulatus* Nees 1834 - EUPELMIDAE.

♀ X 1

**Impression:** VERY DARK METALLIC BODY; DARK ANTENNAE; YELLOW & BROWN LEGS; BROWN-BASED LARGELY YELLOW OVIPOSITOR SHEATHS. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 2.3mm

**Ratios:** Head + Thorax/Body 50% Flagellum/Head + Thorax 54% Wing/Body 78% Ovip/Body 27%

**Antennae:** 11(1r)73. dark neutral brown; metallic scape; continuous taper to distinct pointed club; funicle even-coloured, without contrasting joints.

**Head:** dark metallic green with purple shades; coriaceous sculpture; deep-red ocelli.

**Eyes:** large; dark.

**Mouthparts:** largely dark mandibles with yellow roots; dark appendages.

**Thorax:** dark metallic green; bulging mesoscutum with reticulated sculpture; dent of notaulices at front only; no median line; large dark tegulae; no foveae; coriaceous scutellum with longitudinal ridge; all reticulate mesepimeron

**legs:** hind coxae not much longer than mid-coxae; coxae metallic; femora dark with yellow ends; tibiae dark with more or less yellow at ends; yellow tarsi infused with brown tinges.

**Wings:** clear; marginal vein at least 3 X length of both post-marginal & stigmal veins.

**Gaster:** dark metallic; .

**Ovipositor sheaths:** dark at base with prominent long yellow band tapering off to darker infusion at tip; sheaths as long as hind tibia.

♂ X 0

**Impression:** (Dr Askew reports this as virtually indistinguishable from ♂ *E. urozonus*) DARK METALLIC BODY; DARK ANTENNAE; PALE & DARKER BROWN LEGS. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 1.8mm

**Ratios:** Head + Thorax/Body ?%; Fl/Head + Thorax ?%; Wing/Body ?%.

**Antennae:** 11(1r)73; dark brassy-brown; not tapered, but slightly swollen club; hairy; sturdy.

**Head:** metallic green and dark, with concave front.

**Eyes:** bright red, widely spaced; ocelli.

**Mouthparts:** dark small appendages; pale yellow-tinged mandibles.

**Thorax:** very dark metallic green top; hairy; reticulate mesoscutum; complete but shallow notaulices; neutral brown tegulae; coriaceous scutellum; largely glossy mesepimeron.

**Legs:** purple metallic coxae which show up characteristically in daylight; dark green or brown femora & neutral brown tibiae; pale neutral brown tarsi.

**Wings:** clear; mid-brown hairs and veins; stigmal and post-marginal veins same length, stigma and uncus strongly marked; clear; marginal vein at least 2.5 X length of post-marginal vein..

**Gaster:** very dark metallic green-brown; hairy; broad from above, thin from side.



**Eupelmus urozonus** Dalman 1820 - EUPELMIDAE.

♀ X 34

**Impression:** VERY DARK SLENDER METALLIC GREEN BODY; METALLIC, DARK & YELLOW LEGS; DARK ANTENNAE; SHORT OVIPOSITOR SHEATHS. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 2.7mm (1.8-3.4)

**Ratios:** Head+Thorax/Body 55%; Flagellum/Head+Thorax 51%; Wing/Body 80%; Ovip/Body 18%.

**Antennae:** 11(1r)73; very dark; dark, metallic green scape; flat, wide club; funicle not tapered.

**Head:** dark metallic green, slightly hairy; small dark ocelli.

**Eyes:** large and dark brown.

**Mouthparts:** small dark appendages; paler yellowish mandibles.

**Thorax:** very dark metallic green, with long but sparse, decumbent white hairs; reticulate mesoscutum; full-length but shallow notaulices; dark neutral-brown tegulae; reticulate scutellum; mesepimeron reticulate.

**legs:** dark green metallic coxae; dark green metallic femur, with yellow joints; yellow tibiae and tarsi though latter have darker marks on each joint.

**Wings:** clear; large, rounded, with transparent veins and hairs; stigmal vein short, without darkening at head; clear; marginal vein at least 2.5 X length of post-marginal vein.

**Gaster:** dark green metallic, with square end seen from above; covered with short, decumbent white hairs.

**Ovipositor sheaths:** dark, with prominent yellow band in middle; very short.

♂ X 22

**Impression:** VERY DARK GREEN METALLIC HEAD & THORAX; DARK METALLIC GREEN-BROWN GASTER; PURPLE & GREEN METALLIC LEGS, WITH PALE BANDS; DARK ANTENNAE. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 1.8mm (1.3-2.5)

**Ratios:** Head+Thorax/Body 59%; Fl/Head+Thorax 52%; Wing/Body 78%.

**Antennae:** 11(1r)73; dark brassy-brown; not tapered, but slightly swollen club; hairy; sturdy.

**Head:** metallic green and dark, with concave front.

**Eyes:** bright red, widely spaced; dirty straw-coloured ocelli.

**Mouthparts:** dark small appendages; pale yellow-tinged mandibles.

**Thorax:** very dark metallic green top; hairy; reticulate mesoscutum; complete but shallow notaulices; neutral brown tegulae; coriaceous scutellum; largely glossy mesepimeron.

**Legs:** purple metallic coxae which show up characteristically in daylight; dark green or brown femora & neutral brown tibiae; pale neutral brown tarsi.

**Wings:** clear; mid-brown hairs and veins; stigmal and post-marginal veins same length, stigma and uncus strongly marked; clear; marginal vein at least 2.5 X length of post-marginal vein..

**Gaster:** very dark metallic green-brown; hairy; broad from above, thin from side.



*Eupelmus vesicularis* (Retzius 1793) - EUPELMIDAE.

♀ X 1

**Impression:** VERY DARK BRONZE-GREEN HEAD; DINGY METALLIC GREEN THORAX; DARK NEUTRAL BROWN GASTER WITH TESTACEOUS BASE; DARK BRASSY ANTENNAE; YELLOW & BROWN LEGS; INCONSPICUOUS TINY OVIPOSITOR SHEATHS; RUDIMENTARY WINGS. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 2.8mm

**Ratios:** Head+Thorax/Body 55%; Flagellum/Head+Thorax 56; Wing/Body 0% (**virtually**); Ovip/Body 13%.

**Antennae:** 11(1r)73; fat yellow scape; tiny slender metallic green pedicel; the rest dark brassy; evenly but strongly tapered.

**Head:** Very dark bronze & green metallic; lightly alutaceous; ocelli pale red and inconspicuous.

**Eyes:** Red; mid-sized.

**Mouthparts:** Dark neutral appendages; dark mandibles with dirty yellow at base.

**Thorax:** Metallic green; pronotum with longitudinal testaceous line; alutaceous mesoscutum with testaceous edges; no notaulices; no median line; tegulae; scutellum with testaceous edges; mesepimeron.

**legs:** Metallic coxae; dirty yellow trochanters; dark brown femora with yellow tip; tibiae yellow with brown infusion towards tip; yellow tarsi with dark tip and row of black pegs.

**Wings** much reduced (brachypterous); apex of rudimentary forewing rounded..

**Gaster:** Dark neutral brown with short testaceous base; plump; segmented with bronze edges; alutaceous & punctate.

**Ovipositor sheaths:** Tiny, thicker in middle; dark base and tip with yellow band between.

♂ X 3

**Impression:** VERY DARK METALLIC BODY WITH GREEN & PURPLE TINTS; DARK ANTENNAE; DARK & YELLOW BANDED LEGS; FULL-LENGTH WINGS. ONE ring, SEVEN funicular & FIVE tarsal segments.

**Length:** Body 1.6mm

**Ratios:** Head+Thorax/Body 58%; Fl/Head+Thorax 71%; Wing/Body 80%.

**Antennae:** 11(1r)73; scape faintly narrowly yellow below; the rest black; funicle segments 1-3 with bump below, set with a group of specialised sensillae (*difficult to spot*); comparatively long, un-tapered segments.

**Head:** Dirty olive-green metallic with some purple lights; coriaceous; short hairs; red-brown ocelli.

**Eyes:** Mid-sized; red-brown.

**Mouthparts:** Dark appendages & mandibles.

**Thorax:** Dirty olive-green metallic with bright green tints in part; coriaceous mesoscutum; full-length notaulices; no median line; neutral brown tegulae; coriaceous scutellum; mesepimeron glossy above, strigose-coriaceous below.

**Legs:** Purple metallic coxae; dark femora with yellow base; middle & hind tibiae with yellow bases and well-defined dark ends; front tibiae more generally dirty yellow.

**Wings** Clear; long marginal vein several times length of post-marginal and stigmal veins which are equal in length.

**Gaster:** Very dark bronzy-green; shallow coriaceous sculpture with hairs round edge; wide; shallow; segmented with stepped edges.



## Common factors for Eulophidae in this section

DARK METALLIC OR NON-METALLIC

FOUR TARSAL SEGMENTS

FEMALE EULOPHINAE HAVE TWO-SEGMENTED ANTENNAL CLUB

VARIABLE RING & FUNICULAR SEGMENTS

VARIABLE PRONOTUM

NOTAULICES MOSTLY WELL-MARKED

PETIOLATE OR SESSILE

OVIPOSITOR SHORT OR NOT VISIBLE



*Aprostocetus aethiops* (Zetterstedt 1838) – EULOPHIDAE (Tetrastichinae)

♀ X 6

**Impression:** BLACK BODY; BROWN TO YELLOW LEGS; STRAW-COLOURED ANTENNAE; OVIPOSITOR SHEATHS NOT VISIBLE. TWO ring, THREE funicular & FOUR tarsal segments.

**Length:** Body 2.0mm

**Ratios:** Head+Thorax/Body 49%; Fl/Head+Thorax 48%; Wings/Body 100%; Ovip/Body 0%.

**Antennae:** 11(2r)33; translucent straw-coloured; fat dark scape & flask-shaped pedicel; flagellum slender; not tapered; pointed end to club.

**Head:** black; smooth with faint coriaceous sculpture; face heavily excavated; red ocelli.

**Eyes:** large, red

**Mouthparts:** dark brown mandibles; pale appendages.

**Thorax:** black; mesoscutum slightly leathery with single line of hairs on each side; long deep notaulices; translucent dark brown tegulae; lightly leathery, smooth scutellum with two longitudinal lines, and a pair of long spines on each side; median line impressed, but not quite to back or front; mesepimeron smooth & glossy.

**Legs:** dark leathery coxae; brown femora with yellow joints; yellow tibiae, back pair largely dark; yellow tarsi, with dark 'socks'.

**Wings:** clear; translucent pale yellow veins with darker hairs; long marginal, no post-marginal vein; long stigmal vein and stigma; slight break (clear portion) between sub-marginal & basal veins (very faint vein, curving down across wing).

**Gaster:** black; wide, pointed; smooth with faint surface sculpture; segmented.

**Ovipositor sheaths:** indicated but not truly visible.



♂ X 1

**Impression:** DARK HEAD & GASTER; BLACK THORAX; DARK TO YELLOW LEGS; BROWN ANTENNAE. TWO ring, THREE funicular & FOUR tarsal segments.

**Length:** Body 1.2mm

**Ratios:** Head+Thorax/Body 58%; Fl/Head+Thorax 114%; Wings/Body 108%.

**Antennae:** 11(2r)43; mid-brown; swollen pedicel; long & thin.

**Head:** dark.

**Eyes:** red.

**Mouthparts:** dark brown mandibles; pale appendages

**Thorax:** black; mesoscutum slightly leathery with single line of hairs on each side; long deep notaulices; translucent dark brown tegulae; lightly leathery, smooth scutellum with two longitudinal lines, and a pair of long spines on each side; median line impressed, but not quite to back or front; mesepimeron smooth & glossy.

**Legs:** dark shiny coxae; banded brown femora; yellow tibiae and tarsi, with dark claws.

**Wings:** clear; yellow hairs and veins; long stigmal, post-marginal veins; slight break (clear portion) between sub-marginal/basal veins.

**Gaster:** dark; thin; square-ended; reasonably wide, but less so than female.





***Aulogymnus arsames*** (Walker 1838) – EULOPHIDAE (Eulophinae)

♀ X 12

**Impression:** DARK METALLIC BRONZE-GREEN HEAD; CONTRASTING GREEN & BRONZE THORAX; DARK BROWN GASTER WITH GREEN TINGES; METALLIC TO PALE YELLOW LEGS; BROWN ANTENNAE; OVIPOSITOR SHEATHS NOT VISIBLE. TWO ring, THREE funicular, FOUR tarsal segments.

**Length:** Body **2.1mm** (1.6-2.4)

**Ratios:** Head+Thorax/Body 53%; Fl/Head+Thorax 39%; Wings/Body 81%; Ovip/Body 0%.

**Antennae:** 11(2r)32; neutral-brown; first funicle segment approximately the same length as pedicel (*see a. skianeuros*); hairy.

**Head:** dark bronze-green metallic; very short; very dark red-brown ocelli.

**Eyes:** large, brown.

**Mouthparts:** mid-brown appendages and mandibles.

**Thorax:** dark green; reticulate mesoscutum; deep full-length notaulices; dark-brown tegulae; contrasting narrow bronze scutellum, profile nearly flat, lightly reticulate; mesepimeron very lightly sculpted lengthwise.

**Legs:** metallic green reticulated coxae; dark brown femora; remainder yellow.

**Wings:** clear; sometimes with faint cloud below stigma; veins and hairs mid yellow/brown; distinct elongated stigma, short post-marginal vein.

**Gaster:** very dark brown, with metallic green lights; smooth; wide, pointed.

**Ovipositor sheaths:** not visible.

♂ X 4

**Impression:** DARK METALLIC GREEN HEAD; CONTRASTING GREEN & BRONZE THORAX; BRONZE GASTER; DARK TO PALE LEGS; MID-BROWN ANTENNAE. TWO ring, FOUR funicular, FOUR tarsal segments.

**Length:** Body **1.8mm** (1.6-1.9)

**Ratios:** Head+Thorax/Body 58%; Fl/Head+Thorax 49%; Wings/Body 82%.

**Antennae:** 11(2r)43; mid-brown; pedicel round & glossy; scape fat & brown; long whorls of pale hairs; slender.

**Head:** dark metallic green.

**Eyes:** red.

**Mouthparts:** dark brown appendages and mandibles.

**Thorax:** dark metallic green; notaulices complete & deep; contrasting bronze scutellum; profile not much arched.

**Legs:** metallic coxae; brown femora; the rest pale yellow; contrasting yellow knees.

**Wings:** clear; pale yellow hairs and veins; distinct elongated stigma, very short post-marginal vein;

**Gaster:** bronzy-brown, flat & wide, reasonably hairy; not particularly glossy; sessile.



***Aulogymnus euedoreschus*** (Walker 1839) – EULOPHIDAE (Eulophinae)

♀ X 4

**Impression:** DARKISH METALLIC GREEN HEAD & GASTER; CONTRASTING GREEN & GOLDEN THORAX; METALLIC & GOLD LEGS; YELLOW-BROWN ANTENNAE; OVIPOSITOR SHEATHS NOT VISIBLE; CLOUDED WINGS. TWO ring, THREE funicular, FOUR tarsal segments.

**Length:** Body **2.9mm** (2.6-3.2)

**Ratios:** Head + Thorax/Body 54%; Fl/Head + Thorax 41%; Wings/Body **81%**; Ovip/Body **0%**.

**Antennae:** 11(2r)32; yellow/brown; long, bright yellow scape.

**Head:** bright, but darker, metallic green.

**Eyes:** red, largish.

**Mouthparts:** yellow/brown mandibles; small pale yellow appendages.

**Thorax:** darker metallic green; deep full-length notaulices; contrasting golden-green scutellum.

**Legs:** metallic femora and coxae; middle and hind tibiae golden yellow.

**Wings:** clear, with two large fuscous clouds; dark yellow veins and hairs; distinct elongated, thick stigma, very short post-marginal vein.

**Gaster:** bright dark metallic green; wide and pointed.

**Ovipositor sheaths:** not measurable.

♂ x 1

**Impression:** DARK GREEN METALLIC HEAD & THORAX; GREEN & DARK COPPER GASTER; METALLIC & GOLDEN LEGS; BRASSY-GOLD ANTENNAE. TWO ring, FOUR funicular, FOUR tarsal segments.

**Length:** Body **2.0mm**

**Ratios:** Head + Thorax/Body 63%; Fl/Head + Thorax 52%; Wings/Body **90%**.

**Antennae:** 11(2r)43; brassy-golden; dark metallic scape & pedicel; stout; hairy.

**Head:** dark metallic green;

**Eyes:** red, largish.

**Mouthparts:** yellow-brown mandibles; small pale yellow appendages.

**Thorax:** darker metallic green; leathery mesoscutum; deep full-length notaulices; pale neutral brown tegulae; contrasting leathery golden-green scutellum; sculpted mesepimeron.

**Legs:** metallic coxae and femora; the rest golden yellow.

**Wings:** clear, with two large fuscous clouds; dark yellow veins and hairs; distinct elongated, thick stigma, very short post-marginal vein.

**Gaster:** first segment glossy dark green; the rest dark copper; wide and flat; segmented; inconspicuous dark hairs.



***Aulogymnus gallarum*** (Linnaeus 1761) – EULOPHIDAE (Eulophinae)

♀ X 13 [typical form, parasitic on *Andricus quercusramuli*, flying during June/July]

**Impression:** DARK METALLIC BRONZE-GREEN HEAD & THORAX; DARK BROWN GASTER WITH GREEN TINGES; METALLIC TO PALE YELLOW LEGS; DARK BRASSY ANTENNAE; OVIPOSITOR SHEATHS NOT VISIBLE. TWO ring, THREE funicular, FOUR tarsal segments.

**Length:** Body **2.3mm** (1.9-2.8)

**Ratios:** Head+Thorax/Body 55%; Fl/Head+Thorax 40%; Wings/Body 81%; Ovip/Body 0%.

**Antennae:** 11(2r)32; dark brassy; long scape set high and projecting above head; first funicle segment approximately the same length as pedicel (*see A. skianeuros*); hairy.

**Head:** dark bronze-green metallic; reticulate; large red ocelli.

**Eyes:** large, brown.

**Mouthparts:** mid-brown appendages and mandibles.

**Thorax:** dark metallic bronze-green; mesoscutum reticulate; deep full-length notaulices; dark straw tegulae; scutellum reticulated, with two pairs of long black spines; mesepimeron reticulate.

**Legs:** metallic green reticulated coxae; dark brown femora; the remainder pale yellow with dark 'socks'.

**Wings:** clear; sometimes with faint cloud below stigma; veins and hairs mid yellow/brown; distinct elongated stigma, short post-marginal vein.

**Gaster:** very dark brown, with metallic green lights; smooth; wide, pointed.

**Ovipositor sheaths:** not measurable.

♂ X 10

**Impression:** DARK GREEN METALLIC HEAD & THORAX; DARK BROWN & GREEN METALLIC GASTER; METALLIC TO YELLOW LEGS; BRASSY ANTENNAE. TWO ring, FOUR funicular, FOUR tarsal segments.

**Length:** Body **1.8mm** (1.5-2.0)

**Ratios:** Head+Thorax/Body 61%; Fl/Head+Thorax 36%; Wings/Body 82%.

**Antennae:** 11(2r)43; brassy; lengthy metallic scape, small round pedicel; well-separated segments with clubbed tip; sensillae; decumbent hairs.

**Head:** brown with dark green metallic tints; large red ocelli.

**Eyes:** modest-sized, red.

**Mouthparts:** all nondescript.

**Thorax:** very dark metallic green; a few longish hairs; mesoscutum reticulated; deep full-length notaulices; dark straw tegulae; scutellum reticulated, with two pairs of long black spines; mesepimeron reticulate;.

**Legs:** metallic coxae & femora; yellow trochanters; mid & hind tibiae pale yellow; front tibiae entirely brown mixed in with yellow; tarsi yellow with dark 'socks'.

**Wings:** clear; but sometimes dark mark round stigma & at junction of sub-marginal & marginal veins; brown hairs and veins; distinct elongated stigma, very short post-marginal vein;.

**Gaster:** very dark; brown & dark metallic green; shiny with faint cross sculpture; segmented; blunt end, slender from side; wide.



*Aulogymnus gallarum f. pulchra* (Linnaeus 1761) –

EULOPHIDAE (Eulophinae)

♀ X 1 [over-wintering form, flying April/May parasitic on *Neuroterus* spangle galls]

Impression: **DARK METALLIC GREEN HEAD & THORAX; BROWN & GREEN GASTER; TAPERED DARK TO PALE LEGS; MID-BROWN ANTENNAE; OVIPOSITOR SHEATHS NOT VISIBLE. TWO ring, THREE funicular, FOUR tarsal segments.**

Length: **Body 2.2mm**

Ratios: **Head + Thorax/Body 55%; Fl/Head + Thorax 48%; Wings/Body 91%; Ovip/Body 0%.**

Antennae: **11(2r)32; mid-brown; slight taper to club; fat and hairy.**

Head: **dark green metallic; leathery; hairs at back; dark testaceous edge to clypeus.**

Eyes: **red, medium-large.**

Mouthparts: **chestnut tipped mandibles, dark testaceous appendages.**

Thorax: **dark metallic green; mesoscutum reticulated; deep full-length notaulices; tegulae testaceous; scutellum leathery; mesepimeron semi-glossy with leathery sculpture.**

Legs: **coxae metallic, femora brown; trochanter and trochantellus yellow-banded; tibiae and tarsi yellow, but middle tibia has a rich brown line on the muscled underside.**

Wings: **clear, but faint brown cloud round stigma and at base of marginal vein; brown veins and hairs; distinct elongated stigma; very short post-marginal vein.**

Gaster: **first segment metallic green; the rest dull brown with faint purple tinges; bands of hair; leathery microsculpture; wide and very like that of the male, but deep in front and middle.**

Ovipositor sheaths: **not visible.**

♂ X 2

Impression: **DARK GREEN HEAD & THORAX; DARK BROWN & GREEN GASTER; DARK TO YELLOW LEGS; DARK ANTENNAE.. TWO ring, FOUR funicular, FOUR tarsal segments.**

Length: **Body 2.0mm**

Ratios: **Head + Thorax/Body 62%; Fl/Head + Thorax 54%; Wings/Body 98%.**

Antennae: **11(2r)43; dark.**

Head: **dark green metallic; leathery, hairs at back; dark testaceous edge to clypeus.**

Eyes: **red, medium-large**

Mouthparts: **chestnut tipped mandibles; dark testaceous appendages**

Thorax: **dark metallic green; mesoscutum reticulated; deep full-length notaulices; testaceous tegulae; scutellum leathery; mesepimeron semi-glossy with leathery sculpture.**

Legs: **coxae metallic; femora brown; trochanter and trochantellus yellow-banded; tibiae and tarsi yellow, but the middle tibiae have a rich brown line on the muscled underside.**

Wings: **clear, but faint brown cloud round stigma and at base of marginal vein; brown veins and hairs; distinct elongated stigma, very short post-marginal vein.**

Gaster: **first segment metallic green, the rest dull brown with faint purple tinges; bands of hair; leathery microsculpture; wide and flat, segmented.**



***Aulogymnus skianeuros*** (Ratzeburg 1844) – EULOPHIDAE (Eulophinae)

♀ X 83

**Impression:** DARK GREEN-GOLD HEAD & THORAX; DARK GREEN GASTER; METALLIC TO YELLOW LEGS; GOLDEN-BROWN ANTENNAE; OVIPOSITOR SHEATHS NOT VISIBLE. TWO ring, THREE funicular, FOUR tarsal segments.

**Length:** Body **2.8mm** (1.5-3.5)

**Ratios:** Head+Thorax/Body 51%; Fl/Head+Thorax 40%; Wings/Body **78%**; Ovip/Body **0%**.

**Antennae:** 11(2r)32; neutral golden-brown; normally with dark metallic pedicel & scape, though they may be golden; first funicle segment distinctly longer than pedicel (*see A. arsames*); large widely separated segments; not tapered, hairy.

**Head:** dark green/gold; reticulated; dark neutral-brown ocelli.

**Eyes:** brighter red-brown, with dark internal reticulation; largish.

**Mouthparts:** dark metallic mandibles; very dark appendages.

**Thorax:** all dark green/gold; strongly arched in profile; mesoscutum reticulate; deep full-length notaulices; neutral brown tegulae; scutellum reticulate; mesepimeron reticulated with semi-circular swirls.

**Legs:** metallic coxae and femora, with pale yellow trochantellus; the remainder pale yellow.

**Wings:** clear, but with two small fuscous clouds on wing, one round stigma, the other at junction of marginal & stigmal veins (*may be difficult to see*); distinct elongated stigma, moderate post-marginal vein; very dark stigmal vein; dark at junction between marginal & basal veins.

**Gaster:** very dark shiny metallic green; pointed.

**Ovipositor sheaths:** not visible.

♂ X 84

**Impression:** DARKER METALLIC GREEN-GOLD HEAD & THORAX; GREEN-BROWN GASTER; METALLIC TO YELLOW LEGS; BROWN ANTENNAE. TWO ring, FOUR funicular, FOUR tarsal segments.

**Length:** Body **2.1mm** (1.3-3.1)

**Ratios:** Head+Thorax/Body 57%; Fl/Head+Thorax 46%; Wings/Body **84%**.

**Antennae:** 11(2r)43; neutral brown, hairy; dark metallic scape & pedicel; fat 3rd segment; large, widely separated segments.

**Head:** dark metallic green; reticulate; large dark ocelli.

**Eyes:** deep brown-red.

**Mouthparts:** rich dark mandibles, with pale appendages.

**Thorax:** darker clouded metallic green, with golden tinges; strongly arched in profile; mesoscutum reticulate; deep full-length notaulices; dark neutral-brown tegulae; scutellum reticulate; lightly-reticulate bronze mesepimeron.

**Legs:** metallic coxae; green & brown femora, with golden trochantellus; the rest pale yellow.

**Wings:** clear; heavily fringed with transparent hairs; veins & hairs mid-neutral brown; distinct elongated stigma, quite long post-marginal vein.

**Gaster:** dark metallic green/brown; may appear bronze from above; wide; thin from side.



*Aulogymnus trilineatus* (Mayr 1877) – EULOPHIDAE (Eulophinae)

♀ X 7

**Impression:** BRILLIANT METALLIC GREEN HEAD & THORAX; BRILLIANT GREEN & BRONZE GASTER; METALLIC & YELLOW LEGS; DARK YELLOW ANTENNAE; OVIPOSITOR NOT VISIBLE. TWO ring, THREE funicular, FOUR tarsal segments.

**Length:** Body 3.8mm (2.4-4.3)

**Ratios:** Head + Thorax/Body 60%; Fl/Head + Thorax 34%; Wings/Body 84%; Ovip/Body 0%.

**Antennae:** 11(2r)32; segments dull yellow beneath and darker on top; long golden-brown scape, short, slender pedicel; 1st funicular segment long; club apparently un-segmented; short, decumbent hairs.

**Head:** brilliant metallic green, reticulated; sparse gold hairs.

**Eyes:** red, moderately large.

**Mouthparts:** brown mandibles; small, pale yellow appendages.

**Thorax:** brilliant metallic green, reticulated, largely hairless; deep full-length notaulices.

**Legs:** reticulated metallic green coxae & femora, with yellow trochanter; middle and hind tibiae mostly pale yellow.

**Wings:** clear, two faint fuscous marks (*not easy to spot*); distinct elongated stigma, equal-length post-marginal vein;

**Gaster:** brilliant green, with bronze tints; wide, pointed with hairy edges.

**Ovipositor sheaths:** none visible.

♂ X 1

**Impression:** DARK GREEN METALLIC BODY; YELLOW & BROWN LEGS; DARK BROWN ANTENNAE. TWO ring, FOUR funicular, FOUR tarsal segments.

**Length:** Body 2.9mm

**Ratios:** Head + Thorax/Body 61%; Fl/Head + Thorax 59%; Wings/Body 85%.

**Antennae:** 11(2r)43; very dark neutral brown; pedicel small and round; fat green metallic scape; fat 3rd segment; hairy.

**Head:** dark green metallic; reticulated and part alutaceous; hairy at back; testaceous clypeus with large central notch.

**Eyes:** mid-size, red-brown.

**Mouthparts:** pale mandibles and appendages.

**Thorax:** dark green metallic; mesoscutum reticulated; deep full-length notaulices black tegulae; scutellum reticulated; mesepimeron alutaceous;

**Legs:** reticulated green metallic coxae; yellow band at top and bottom of brown femora; tibiae and tarsi yellow.

**Wings:** clear, but small brown cloud at base of marginal vein and another around stigma; distinct wide elongate stigma with uncus; short stigmal vein.

**Gaster:** dark metallic green; leathery; spiny, segmented edges; wide, flat.



***Baryscapus diaphantus*** (Walker 1839) – EULOPHIDAE (Tetrastichinae)

♀ X 24

**Impression:** DARK METALLIC BLUE-GREEN HEAD & THORAX; DARK BRONZE-GREEN GASTER; BROWN & YELLOW LEGS; BRASSY ANTENNAE; STUBBY OVIPOSITOR. TWO ring, THREE funicular & FOUR tarsal segments.

**Length:** Body 1.4mm (1.1-1.8)

**Ratios:** Head+Thorax/Body 49%; Fl/Head+Thorax 36%; Wings/Body 90%; Ovip/Body 10%.

**Antennae:** 11(2r)33; brassy gold; long swollen glossy brown pedicel; heavy club; short and fat; hairy.

**Head:** dark metallic blue-green; faint alutaceous microsculpture; slender back to front; few obvious hairs; pale translucent ocelli.

**Eyes:** almost black.

**Mouthparts:** brown mandibles; small deep yellow appendages.

**Thorax:** dark metallic blue-green; short pronotum; mesoscutum with faint longitudinal striae; deep full-length notaulices; translucent pale brassy tegulae; scutellum with very faint longitudinal alutaceous striae; mesepimeron smooth with some very faint sculpture.

**Legs:** metallic coxae; femora and tibiae brown with yellow tinges; yellow, contrasting joints; pale yellow tarsi; dark claws.

**Wings:** clear; pale yellow hairs and veins; long thickening stigmal vein without a post-marginal vein; with slight break between submarginal and basal veins (very faint vein, curving down across wing).

**Gaster:** dark bronze-green metallic; coriaceous microsculpture but shiny; triangular from side; long diamond-shaped from above.

**Ovipositor sheaths:** dark; hairy; fat base, tapering.

♂ X 5

**Impression:** VERY DARK METALLIC GREEN HEAD & THORAX; BROWN-GREEN GASTER; BROWN & PALE LEGS; BRASSY ANTENNAE. TWO ring, FOUR funicular & FOUR tarsal segments.

**Length:** Body 1.1mm (1.0-1.2)

**Ratios:** Head+Thorax/Body 58%; Fl/Head+Thorax 37%; Wings/Body 92%.

**Antennae:** 11(2r)43; brassy-gold; mid-sized glossy brown pedicel; rounded funicular segments; short and fat; clubbed; hairy.

**Head:** very dark metallic green; faint alutaceous microsculpture; few hairs; slender back to front; pale translucent ocelli.

**Eyes:** large, pale red.

**Mouthparts:** brown mandibles; small yellow appendages.

**Thorax:** very dark metallic green; short pronotum; mesoscutum with faint longitudinal striae; full-length notaulices; translucent pale brassy tegulae; scutellum with very faint longitudinal striae; mesepimeron smooth with some faint microsculpture.

**Legs:** metallic coxae; brown femora and tibiae; pale yellow tarsi and dark claws.

**Wings:** clear; pale yellow hairs and veins; long thickening stigmal, without a post-marginal vein; slight break between submarginal and basal veins; very hairy.

**Gaster:** dark brown with green tinges; coriaceous microsculpture; shiny; segmented; flat & wide; long, sparse hairs round end of sides.



**Pediobius clita** (Walker 1839) – EULOPHIDAE (Entadontinae)

♀ X 20

**Impression:** BRILLIANT METALLIC GREEN HEAD & GASTER; PURPLE-SHOT GREEN THORAX; PETIOLATE; METALLIC & WHITE LEGS; METALLIC ANTENNAE; NO VISIBLE OVIPOSITOR SHEATHS. ONE ring, THREE funicular & FOUR tarsal segments.

**Length:** Body **1.8mm** (1.3-2.1)

**Ratios:** Head+Thorax/Body 61%; Fl/Head+Thorax 28%; Wings/Body 77%; Ovip/Body 0%.

**Antennae:** 11(1r)33; all metallic; short & fat, with big club.

**Head:** brilliant metallic green; reticulate; pale chestnut ocelli.

**Eyes:** dark.

**Mouthparts:** dark neutral-brown mandibles; tiny dark appendages.

**Thorax:** brilliant metallic green shot with purple; lightly sculpted; short purple pronotum; reticulate green mesoscutum; full-length notaulices; blue-green tegulae; reticulate scutellum; high-gloss mesepimeron.

**Legs:** brilliant metallic coxae, femora and tibiae; mainly pale tarsi with dark claws.

**Wings:** clear; dark veins and hairs; short stigmal & post-marginal veins, with slight break between sub-marginal/basal veins (very faint vein, curving down across wing).

**Gaster:** brilliant glossy dark metallic green; short & fat from side and above; heavily indented at front; long, narrow petiole.

**Ovipositor sheaths:** none visible.

♂ X 5

**Impression:** FROM BRILLIANT METALLIC GREEN HEAD & GASTER TO DARKER; PURPLE-SHOT GREEN THORAX; PETIOLATE; METALLIC & WHITE LEGS; METALLIC ANTENNAE. ONE ring, TWO funicular & FOUR tarsal segments.

**Length:** Body **1.6mm** (1.4-1.7)

**Ratios:** Head+Thorax/Body 63%; Fl/Head+Thorax 31%; Wings/Body 76%.

**Antennae:** 11(1r)23; dark green metallic; thin with fine end; whorls of medium-length hairs.

**Head:** brilliant metallic green; reticulate; pale chestnut ocelli.

**Eyes:** dark.

**Mouthparts:** dark neutral-brown mandibles; tiny dark appendages.

**Thorax:** brilliant metallic green shot with purple; lightly sculpted; short purple pronotum; reticulate green mesoscutum; full-length notaulices; blue-green tegulae; reticulate scutellum; high-gloss mesepimeron.

**Legs:** brilliant metallic coxae, femora and tibiae; mainly pale tarsi with dark claws.

**Wings:** clear; dark veins and hairs; short stigmal & post-marginal veins; slight break between sub-marginal and basal veins.

**Gaster:** brilliant glossy dark metallic green; short & fat from side and above; heavily indented at front; long, narrow petiole.





***Pediobius lysis*** (Walker 1839) – EULOPHIDAE (Entadontinae)

♀ X 7

**Impression:** BRILLIANT METALLIC GREEN HEAD & THORAX WITH GOLDEN TINT; PURPLE OR GREEN GASTER; PETIOLATE; BLUE-GREEN & DARK LEGS; METALLIC GREEN ANTENNAE; NO VISIBLE OVIPOSITOR. ONE ring, THREE funicular & FOUR tarsal segments.

**Length:** Body **1.6mm** (1.3-1.8)

**Ratios:** Head+Thorax/Body 64%; Fl/Head+Thorax 30%; Wings/Body **87%**; Ovip/Body **0%**.

**Antennae:** 11(1r)33; metallic green; hairy; large club.

**Head:** bright green metallic; reticulate; pale chestnut ocelli.

**Eyes:** large, dark brown, neutral.

**Mouthparts:** mid-neutral appendages and mandibles.

**Thorax:** brilliant metallic green with faint gold tint; reticulate mesoscutum with a pair of long black spines on each side; full-length notaulices, very wide at back; green tegulae; reticulate scutellum with a pair of black spines; glossy mesepimeron.

**Legs:** metallic blue/green; dark tarsi (beware of white hairs disguising this base colour).

**Wings:** clear; brown veins & hairs; short stigmal & post-marginal veins; slight break between sub-marginal and basal veins (very faint vein, curving down across wing);.

**Gaster:** brilliant metallic purple or green polished first segment; the rest dark bronze with some green; wide with short petiole.

**Ovipositor sheaths:** not visible.

♂ X 6

**Impression:** BRIGHT METALLIC BLUE-GREEN HEAD; BLUE-GREEN OR PURPLE THORAX; BLUE-GREEN & PURPLE GASTER; PETIOLATE; BLUE-GREEN & DARK LEGS; METALLIC GREEN ANTENNAE. ONE ring, TWO funicular & FOUR tarsal segments.

**Length:** Body **1.5mm** (1.2-1.7)

**Ratios:** Head+Thorax/Body 61%; Fl/Head+Thorax 31%; Wings/Body **89%**.

**Antennae:** 11(1r)23; metallic green; fat scape & pedicel; long; hairy.

**Head:** bright blue/green metallic; reticulate; pale chestnut ocelli.

**Eyes:** large, dark.

**Mouthparts:** black mandibles & appendages.

**Thorax:** brilliant metallic green with faint gold tint; reticulate mesoscutum with a pair of long black spines on each side; full-length notaulices, very wide at back; green tegulae; coriaceous scutellum with pair of black spines; glossy mesepimeron.

**Legs:** metallic blue/green; dark tarsi (beware of white hairs disguising this base colour).

**Wings:** clear; brown veins & hairs; short stigmal & post-marginal veins; slight break between sub-marginal and basal veins.

**Gaster:** blue-green with purple lights; segmented; first segment large & highly polished, the remainder reticulated; each segment edged with pale hairs.



*Quadrastichus (=Tetrastichus) anysis* (Walker 1839) –

EULOPHIDAE (Tetrastichinae)

♀ X 0

Impression: **ONE** ring, **THREE** funicular & **FOUR** tarsal segments.

Length: **Body 0.95-1.2mm**

Ratios: **Head + Thorax/Body ?%**; **Fl/Head + Thorax ?%**; **Wings/Body ?%**; **Ovip/Body ?%**.

Antennae: 11(1r)33.

Head: .

Eyes: .

Mouthparts: .

Thorax: **mesoscutum**; notaulices, median line; tegulae; foveae; lightly sculpted scutellum with two parallel longitudinal lines & a single pair of bristles; mesepimeron.

Legs: .

Wings: .

Gaster: .

Ovipositor sheaths: **none visible.**

♂ X 5

Impression: **LARGELY DARK NEUTRAL BROWN HEAD & THORAX; DARK NEUTRAL GASTER WITH FRONT PART BANDED DIRTY YELLOW; PALE YELLOW LEGS; MAINLY STRAW-COLOURED ANTENNAE. ONE** ring, **FOUR** funicular & **FOUR** tarsal segments.

Length: **Body 0.9mm**

Ratios: **Head + Thorax/Body 56%**; **Fl/Head + Thorax 67%**; **Wings/Body 114%**.

Antennae: 11(1r)43; pale straw; brown bands on base of pedicel, and narrow ones on joints; whorls of strong hairs at base of segments.

Head: dark neutral brown with more or less dirty yellow round mouth; deeply excavated in front; wide; shallow; comparatively smooth; red-brown closely-set ocelli.

Eyes: dark; large.

Mouthparts: dirty yellow mandibles; brown appendages.

Thorax: dark neutral-brown; shallow & flattened; near-smooth mesoscutum with light largely longitudinal microsculpture; full-length prominent notaulices; slender full-length median line; colourless to brown tegulae; no foveae; lightly sculpted scutellum with two parallel longitudinal lines & a single pair of bristles; glossy mesepimeron.

Legs pale translucent yellow; claws light brown.

Wings: clear; long marginal, with no post marginal vein; mid-length quite wide stigmal vein; prominent parastigma; pale veins; mid neutral-brown quite prominent hairs.

Gaster: neutral brown, with more or less of a translucent dirty yellow band across front; light, formless microsculpture; wide; flat.



*Tamarixia pubescens* (Nees 1834) – EULOPHIDAE (Tetrastichinae)

♀ X 2

**Impression:** WIDE BLACK BODY, DARK LEGS WITH PALE RINGS AT JOINTS; PALE NEUTRAL ANTENNAE; ONE ring, THREE funicular & FOUR tarsal segments.

**Length:** Body 1.3mm

**Ratios:** Head+Thorax/Body 54%; Fl/Head+Thorax 74%; Wings/Body 114%; Ovip/Body 0%.

**Antennae:** 11(1r)33; pale neutral, hairy; but long black scape; large long pedicel; bulging funicular segments; the last three forming a distinct club, pointed.

**Head:** black, slender, flat; smooth.

**Eyes:** large & protuberant; red.

**Mouthparts:** black mandibles; straw appendages.

**Thorax:** black; narrow pronotum; lightly whorled sculpture on mesoscutum with 4 spines; no notaulices, almost invisible median line; black tegulae; no foveae; scutellum with twin shallow side grooves and indistinct sculpture; glossy mesepimeron.

**Legs:** black coxae and femora with straw-yellow joints; straw tibiae and tarsi; darker claws .

**Wings:** translucent; spoon-shaped; slender stigma; hairy with pale veins.

**Gaster:** black; wide; segmented; flat, with short point in middle of end; smooth; long white hairs at back.

**Ovipositor sheaths:** none visible.

♀



♂ X 2

**Impression:** WIDE BLACK BODY, DARK LEGS WITH PALE RINGS AT JOINTS; PALE NEUTRAL ANTENNAE WITH LONG HAIR WHORLS; ONE ring, FOUR funicular & FOUR tarsal segments.

**Length:** Body 1.2mm

**Ratios:** Head+Thorax/Body 56%; Fl/Head+Thorax 110%; Wings/Body 124%.

**Antennae:** 11(1r)43; pale neutral, hairy; but long black scape; large long pedicel; flask-shaped funicular segments; the last three forming a narrow pointed club; distinct very long hairs arising in whorls at base of segments.

**Head:** Eyes: large & protuberant; red.

**Mouthparts:** black mandibles; straw appendages.

**Thorax:** black; narrow pronotum; lightly whorled sculpture on mesoscutum, with 4 spines; no notaulices, almost invisible median line; black tegulae; no foveae; scutellum with twin shallow side grooves and indistinct sculpture; glossy mesepimeron.

**Legs:** black coxae and femora with straw-yellow joints; straw tibiae and tarsi; darker claws.

**Wings:** translucent; spoon-shaped; slender stigma; hairy with pale veins.

**Gaster:** : black; wide; segmented; flat, with short point in middle of end; smooth; long white hairs at back..

Male antenna



*oak-falls - volume two*

*descriptions - parasitoids*

## **Common factors for Ichneumonidae in this section**

20 OR MORE ANTENNAL SEGMENTS

MULTIPLE VEINS ON FOREWING – WHERE PRESENT



***Gelis areator*** (Panzer 1804) (Phygadeuontinae, (ICHNEUMONIDAE)

♀ X 3

*Impression:* CHESTNUT & BLACK HEAD & THORAX; CHESTNUT & DARK BROWN GASTER; PETIOLATE; CHESTNUT LEGS & ANTENNAE; SHORT OVIPOSITOR SHEATHS. TWENTY-TWO antennal, FIVE tarsal segments.

*Length:* Body **4.3mm**.

*Ratios:* Head + Thorax/Body 51%; Ant/Body 77%; Wings/Body **82%**; Ovip/Body **21%**.

*Antennae:* 11(Or)20: chestnut, darkening at tip; dark joints; not tapered.

*Head:* chestnut, with black vertex and a small patch below antennal sockets; small, dark chestnut ocelli.

*Eyes:* large, black; contrasting with colour of head.

*Mouthparts:* chestnut mandibles; dark appendages.

*Thorax:* chestnut with black markings; pronotum short; mesoscutum leathery with three black patches; no notaulices; testaceous tegulae; scutellum leathery; propodeum black; mesepimeron chestnut, with slight shiny sculpture.

*Legs:* chestnut, with darker coxae.

*Wings:* clear; with two dark bands across; dark veins and hairs; dark neutral brown stigma;.

*Gaster:* dark slender petiole ; first, two largely chestnut segments, then all dark brown for final four; long and slender.

*Ovipositor sheaths:* dark; short and thick.

♂ X 0

*Impression:* . antennal, FIVE tarsal segments.

*Length:* Body mm.

*Ratios:* Head + Thorax/Body %; Ant/Body %; Wings/Body %.

*Antennae:* ;

*Head:* ; ocelli.

*Eyes:*

*Mouthparts:* mandibles; appendages

*Thorax:* pronotum; mesoscutum; mesepimeron; tegulae; scutellum; propodeum; notaulices, median line.

*Legs:* .

*Wings:* .

*Gaster:* .



***Gelis formicarius*** (Linnaeus 1758) – ICHNEUMONIDAE

♀ X 3

**Impression:** WINGLESS, BLACK & RED HEAD; YELLOW-RED THORAX; RED-BROWN, RED & BLACK GASTER; LEGS RED-YELLOW; YELLOW-RED & BLACK ANTENNAE; SHORT OVIPOSITOR SHEATHS. ? antennal; FIVE tarsal segments.

**Length:** Body 3.0mm

**Ratios:** Head + Thorax/Body 44%; Ant/Body 72%; Wings/Body 0%; Ovip/Body 24%.

**Antennae:** yellow/red from base to middle, then blackish; scape punctate; long.

**Head:** deep black, with reddish face.

**Eyes:** -

**Mouthparts:** appendages & mandibles blackish-red.

**Thorax:** yellow/red, sometimes with mesonotum & metapleuron dark; short, broader than long; finely alutaceous and closely punctate; dull square scutellum.

**Legs:** reddish-yellow, with the apical tarsal joint brown.

**Wings:** absent.

**Gaster:** reddish-brown with a black front band and red band across rear.

**Ovipositor sheaths:** clearly extended.

♂ X 1

**Impression:** BLACK HEAD & THORAX; DARK BROWN & PALE GASTER; TESTACEOUS LEGS; DARK ANTENNAE. TWENTY FOUR antennal; FIVE tarsal segments.

**Length:** Body 3.3mm

**Ratios:** Head + Thorax/Body 43%; Ant/Head + Thorax 81%; Wings/Body 91%.

**Antennae:** 11(Or)22: dark; fat scape; base of 3<sup>rd</sup> segment gold; long and slender, with slight reverse taper.

**Head:** black.

**Eyes:** black and large.

**Mouthparts:** dark appendages; chestnut mandibles

**Thorax:** black.

**Legs:** tapering in colour from dark coxae to largely testaceous.

**Wings:** clear; short brown hairs, pale brown veins and large, dark pterostigma; closed radial cell.

**Gaster:** dark brown, with narrow, pale band at end of 1<sup>st</sup> segment; short, broad petiole.



**Mastrus deminuens (=castaneus)** (Hartig 1838) -

ICHNEUMONIDAE

♀ X 0

**Impression:** RUST-COLOURED HEAD; BLACK THORAX; ABDOMEN BLACK WITH SOME RED; LEGS DEEP RED & BLACK; ANTENNAE TESTACEOUS TO BROWN. ? antennal; FIVE tarsal segments.

**Length:** Body **4-6mm**

**Ratios:** Head+Thorax/Body %; Ant/Body %; Wings/Body %; Ovip/Body %.

**Antennae:** testaceous to brown at tip; stout.

**Head:** rust-coloured

**Eyes:**

**Mouthparts:** appendages and centre of mandibles yellow, rest dark.

**Thorax:** black.

**Legs:** deep red, with hind tarsi & apices of tibiae black.

**Wings:** slightly clouded.

**Gaster:** black, paling at the base of 5<sup>th</sup> & 6<sup>th</sup> tergites.

**Ovipositor sheaths:**

♂ X 0

**Impression:** BLACK HEAD; RED THORAX; BLACK & RED GASTER; RED LEGS; RED & DARK ANTENNAE. ? antennal; FIVE tarsal segments.

**Length:** Body **mm**

**Ratios:** Head+Thorax/Body %; Fl/Head+Thorax %; Wings/Body %.

**Antennae:** red & dark; stout.

**Head:** yellow.

**Eyes:**

**Mouthparts:**

**Thorax:** red; petiole short & broad, brown & red; sub-petiolate.

**Legs:** deep red; trochanter yellow, hind tibiae black.

**Wings:** slightly clouded.

**Gaster:** black with red-stained centre



***Scambus planatus*** (Hartig 1838) – (Pimplinae, ICHNEUMONIDAE)

♀ X 3

**Impression:** BLACK BODY; WHITE, DARK & TESTACEOUS LEGS; DARK BROWN ANTENNAE; MID-SIZED OVIPOSITOR SHEATHS. TWENTY-THREE antennal, FIVE tarsal segments.

**Length:** Body 6.5mm

**Ratios:** Head+Thorax/Body 44%; Ant/Body 65%; Wing/Body 96%; Ovip/Body 72%.

**Antennae:** 11(Or)21; dark brown; fat scape, tiny ring-like pedicel; 3<sup>rd</sup> segment with rich yellow ring at base; long, slender; hairy.

**Head:** black, glossy; small black ocelli.

**Eyes:** large, black.

**Mouthparts:** black mandibles; grey-white appendages.

**Thorax:** black; smooth hairy mesoscutum; no notaulices; yellow-white tegulae; scutellum smooth & hairy; propodeum lightly sculpted; mesepimeron smooth & hairy.

**Legs:** two front pairs all testaceous; rear pair with white tibiae, ringed with dark at top and bottom; tarsi largely dark.

**Wings:** clear; dark neutral brown veins and hairs; stigma pale neutral brown bounded with dark.

**Gaster:** all black, slender; first five segments heavily punctate; remainder smoother; all hairy.

**Ovipositor sheaths:** black, thick and hairy.



♂ X 1

**Impression:** BLACK HEAD & THORAX; GASTER BLACK ABOVE, WITH WHITE BELOW; BLACK, WHITE & TESTACEOUS LEGS; BROWN ANTENNAE. TWENTY-FIVE ANTENNAL, FIVE TARSAL SEGMENTS.

**Length:** Body 7.4mm

**Ratios:** Head+Thorax/Body 34%; Ant/Body 59%; Wing/Body 67%.

**Antennae:** 11(1r)22; dark brown above, paler beneath; fat dark & pale scape, smaller dark & pale pedicel; long, slender; hairy.

**Head:** black, glossy; small black ocelli.

**Eyes:** large, black.

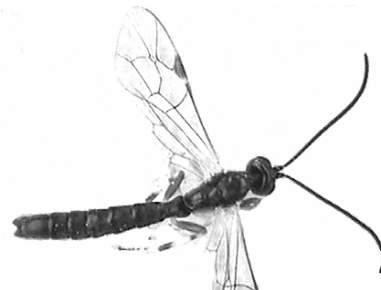
**Mouthparts:** black mandibles; white appendages.

**Thorax:** black, with pale hairs; smooth hairy mesoscutum; no notaulices; yellow-white tegulae; scutellum smooth & hairy; propodeum lightly sculpted; mesepimeron smooth & hairy.

**Legs:** rear coxae black, others pale; testaceous front and rear femora, mid-pair very pale; white tibiae with dark band near top and at bottom; tarsi white, banded dark at bottom of each segment.

**Wings:** clear; dark neutral brown veins and hairs; stigma pale neutral brown bounded with dark.

**Gaster:** black from above, with white centre beneath; slender; first three segments heavily punctate; remainder smooth; all hairy.





## **Common factors for Diapriidae in this section**

BOTH SEXES 13 ANTENNAL & 5 TARSAL SEGMENTS

MULTIPLE VEINS ON FOREWING

SILVER-HAIRED COLLAR ROUND SHORT PETIOLE



***Spilomicrus stigmatalis*** Westwood 1832 – (Diapriidae,  
PROCTOTRUPOIDEA)

♀ X 4

**Impression:** BLACK BODY; DARK AND PALE BULGING LEGS; BLACK ANTENNAE. THIRTEEN ANTENNAL, FIVE TARSAL SEGMENTS.

**Length:** Body 2.8mm.

**Ratios:** Head+Thorax/Body 51%; Ant/Body 67%; Wing/Body 90%; Ovip/Body 0%.

**Antennae:** Sc/Ped/11; black; very long hairy scape; the rest like string of beads; 6-segmented club.

**Head:** black; glossy; sparse long hairs; black close-together ocelli.

**Eyes:** dark; very small.

**Mouthparts:** dark brown mandibles; dark appendages.

**Thorax:** black; mesoscutum glossy, with sparse long slender spines; ; near full-length notaulices; large dark brown tegulae; glossy scutellum; no median line; large, separated foveae; sculpted hairy propodeum with scalloped end; glossy mesepimeron.

**Legs:** chestnut coxae; long dark trochanters with pale bases; fat black femora and dark tibiae with slender pale ends; straw-coloured tarsi with darker claws; hairy; legs characteristic of family *drawing below*).

**Wings:** clear but hairs give faint chestnut tinge; brown costal vein ending in hooked brown stigma; very short marginalis and virtual absence of post-marginalis & stigmatalis .

**Gaster:** black with faint paler edges at front; short slender hairy petiole; shiny; pointed rain-drop shape; one main segment' main segment overhangs the petiole.

**Ovipositor sheaths:** none visible.



♂ X 5

**Impression:** BLACK BODY; LARGELY DARK CHESTNUT LEGS; BLACK ANTENNAE. THIRTEEN ANTENNAL, FIVE TARSAL SEGMENTS.

**Length:** Body 2.9mm

**Ratios:** Head+Thorax/Body 54%; Ant/Body 110%; Wing/Body 104%.

**Antennae:** black; long; slender; hairy; slight reverse taper; no club.

**Head:** black; glossy; sparse long hairs; hairy collar behind head; black close-together ocelli.

**Eyes:** black; very small.

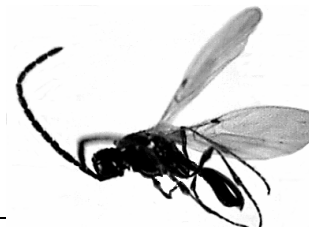
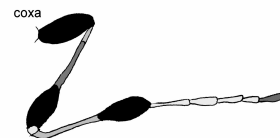
**Mouthparts:** dark mandibles; neutral brown appendages.

**Thorax:** black; mesoscutum glossy with long sparse pale hairs; full-length notaulices; no median line; large black tegulae; large, separated foveae; glossy scutellum; sculpted hairy propodeum ending in two thick rounded protuberances; glossy mesepimeron.

**Legs:** black coxae; black femora and tibiae with slender brown ends; brown tarsi; hairy; shape of legs characteristic of family.

**Wings:** clear but hairs give faint chestnut tinge; brown costal vein ending in hooked brown stigma; very short marginalis and virtual absence of post-marginalis & stigmatalis.

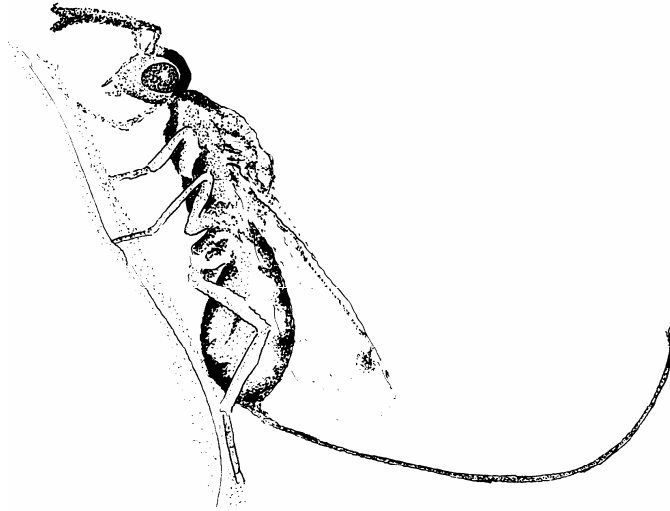
**Gaster:** black; hairless except sparsely at end; glossy; pointed rain-drop shape; one main segment; long slender hairy petiole.



-Kolin Williams-



# Hymenopteran inhabitants



**a summary of key identification points**



# Hymenopteran gall causers: ratios, measurements & descriptions summarised

## SEX

♀ female; ♂ male; ♂ agamic female

**ANT. SEGS** = total number of antennal segments (flagellum) from scape to tip

**COLOUR** = general appearance of each part

**LENGTH** = body length, excluding ovipositor or male organ, in millimetres

**RATIO % W/B** = ratio of wing length to body, as a percentage

SPECIES	SEX	DESCRIPTION	LENGTH	RATIO%	ANT
			MM	W/B	SEGS
<i>Andricus</i>					
<i>A. albopunctatus</i>	♂	black head; striped thorax; black & gold gaster; dark antennae; gold-brown legs	2.9	142	14
<i>A. amenti</i>	♀	yellow-brown head & thorax; red-yellow gaster; brown antennae & legs	2.4	150	13
<i>A. amenti</i>	♂	yellow-brown head & thorax; dark & pale gaster; yellow legs & antennae	2.8	148	15
<i>A. aries</i>	♂	all orange-brown	3.4	126	13
<i>A. callidoma</i>	♀	mid-brown head & thorax; yellow gaster, legs & antennae	1.5	135	13
<i>A. callidoma</i>	♂	all yellow-brown, with dark eyes; yellow legs & antennae	1.5	153	15
<i>A. callidoma</i>	♂	?	?	?	?
<i>A. corruptrix</i>	♀	black body; dark brown antennae & legs	1.9	157	13
<i>A. corruptrix</i>	♂	black body; dark brown antennae; brown to yellow legs	1.7	167	14
<i>A. corruptrix</i>	♂	all bright orange	3.7	123	13
<i>A. curator</i>	♀	black body; paler antennae & legs	2.3	131	14
<i>A. curator</i>	♂	black body; dark yellow antennae & legs	2.0	138	15
<i>A. curator</i>	♂	dark brown head; black thorax; chestnut gaster, legs, & antennae	2.8	125	14
<i>A. fecundator</i>	♀	black or red-brown body; brown & yellow legs; golden antennae	1.6	141	13/14
<i>A. fecundator</i>	♂	black to paler body; yellow-brown legs; darker antennae	1.6	144	14



SPECIES	SEX	DESCRIPTION	LENGTH	RATIO%	ANT
			MM	W/B	SEGS
<i>Andricus</i>					
<i>A. fecundator</i>	♂	black head/thorax; chestnut gaster; dark antennae; brown legs	3.5	127	14
<i>A. glandulae</i>	♀	rich mid-brown thorax & gaster, paler head; yellow legs & antennae	1.5	139	13
<i>A. glandulae</i>	♂	yellow-brown head & thorax; darker gaster; yellow legs & antennae	1.6	150	15
<i>A. glandulae</i>	♂	golden-brown body & legs; brown antennae	3.3	132	14
<i>A. grossulariae</i>	♀	black body, dark legs, gold antennae with dark tip	2.1	114	13
<i>A. grossulariae</i>	♂	black body, yellow legs & antennae	1.9	143	14
<i>A. grossulariae</i>	♂	chestnut-black head, thorax, legs & antennae; chestnut gaster	3.1	130	13
<i>A. inflator</i>	♀	dark brown head & thorax; red-brown gaster; testaceous legs; yellow antennae	3.6	145	14
<i>A. inflator</i>	♂	dark brown body; yellow-brown legs & antennae	2.8	150	15/16
<i>A. inflator</i>	♂	dark head/thorax; paler gaster; gold legs; dark antennae	1.9	143	14/15
<i>A. kollari</i>	♀	Black head & thorax, dark brown gaster; gold-brown antennae; tapered legs	1.8	158	13
<i>A. kollari</i>	♂	black head, thorax & gaster; gold-brown antennae; tapered legs	1.8	173	14
<i>A. kollari</i>	♂	yellow-brown head, thorax, legs & antennae; dark yellow gaster	5.1	117	13
<i>A. legitimus</i>	♂	reddish, with dark-striped thorax; dark antennae & legs	circa 4.5	?	15
<i>A. lignicola</i>	♀	black head & thorax, dark brown gaster; dark antennae & legs	1.8	154	13
<i>A. lignicola</i>	♂	variable black/pale head/thorax, dark brown gaster; dark yellow ant. & legs	1.9	161	14
<i>A. lignicola</i>	♂	all dark yellow, with brown tint	4.7	114	13
<i>A. lucidus</i>	♀	black head & thorax; dark + chestnut gaster; gold antennae; buff legs	2.8	119	13
<i>A. lucidus</i>	♂	black head & thorax, dark + chestnut gaster, antennae & legs	2.5	125	14
<i>A. lucidus</i>	♂	black head & thorax; chestnut-tipped dark gaster; dark antennae; brown legs	2.9	132	13
<i>A. nudus</i>	♀	rich dark brown body; yellow legs & antennae	1.5	145	13
<i>A. nudus</i>	♂	all black body	?	?	15
<i>A. nudus</i>	♂	black head; yellow-brown thorax & gaster; chestnut legs & antennae	2.9	145	14
<i>A. quadrilineatus</i>	♂	gold-brown head, striped thorax; chestnut + dark gaster; orange-brn ant. & legs	2.6	147	14
<i>A. quercuscalicis</i>	♀	black body; dark-tipped gold antennae; gold-brown legs	1.4	153	13
<i>A. quercuscalicis</i>	♂	black body; dark-tipped gold antennae; gold legs	1.3	160	14



SPECIES	SEX	DESCRIPTION	LENGTH	RATIO%	ANT.
			MM	W/B	SEGS
<i>Andricus</i>					
<i>A. quercuscalicis</i>	♂	black & orange head & thorax; black gaster & ant; orange & dark-striped legs	4.8	130	14
<i>A. quercuscorticis</i>	♀	?	2.8	123	13
<i>A. quercuscorticis</i>	♂	?	?	?	15
<i>A. quercuscorticis</i>	♂	brown head & thorax; chestnut gaster; brown legs & antennae	3.7	117	13
<i>A. quercusradicis</i>	♀	yellow head; striped thorax; testaceous gaster; yellow legs & antennae	3.0	131	13
<i>A. quercusradicis</i>	♂	dark brown body; yellow legs & antennae	2.5	159	15
<i>A. quercusradicis</i>	♂	red-brown head & antennae; striped thorax; orange gaster & legs	3.8	131	14
<i>A. quercusramuli</i>	♀	orange-yellow head, thorax & gaster; yellow legs & antennae	1.7	135	13
<i>A. quercusramuli</i>	♂	orange-yellow head + thorax; dark chestnut gaster; yellow legs & antennae	2.1	130	15
<i>A. quercusramuli</i>	♂	?	?	?	?
<i>A. rhizomae</i>	♂	dirty chestnut head; dark thorax; chestnut gaster; dark antennae & legs	4.1	139	14
<i>A. seminatiois</i>	♂	all translucent yellow-red marked with slender black	3.0	139	14
<i>A. solitarius</i>	♀	gold head; red-gold thorax; testaceous gaster; gold-brn legs; brown antennae	2.8	131	13
<i>A. solitarius</i>	♂	black head & thorax; brown gaster & antennae; dark yellow legs	3.3	146	15
<i>A. solitarius</i>	♂	yellow-brown head, gaster, legs & antennae; dark thorax	3.0	?	14
<i>A. testaceipes</i>	♀	black head & thorax; large pale ploughshare; chestnut gaster, legs & antennae	1.5	149	13
<i>A. testaceipes</i>	♂	reddish-yellow body; yellow legs & antennae	?	?	15
<i>A. testaceipes</i>	♂	orange-brown head thorax & legs; pale + dark gaster; testaceous legs	4.0	124	14
<i>Aphelonyx</i>					
<i>A. cerricola</i>	♂	orange-chestnut head + thorax; chestnut + dark gaster; chestnut legs; dark ant.	5.5	126	14
<i>Biorhiza</i>					
<i>B. pallida</i>	♀	gold to brown body, legs & antennae	3.0	104	14
<i>B. pallida</i>	♂	all chestnut-tinged yellow-brown	2.9	123	15
<i>B. pallida</i>	♂	yellow-brown body & legs; orange-brown antennae. WINGLESS	5.3	0	15
<i>C. bella</i>	♀	brown head; dark thorax; chestnut gaster; gold-brown antennae & legs	1.9	120	14
<i>C. bella</i>	♂	Black head & thorax; dark brown gaster; chestnut-yellow legs & antennae	1.6	126	15



SPECIES	SEX	DESCRIPTION	LENGTH	RATIO%	ANT.
			MM	W/B	SEGS
<i>Callirhytis</i>					
<i>C. erythrocephala</i>	♀	yellow-brown head; chestnut thorax & gaster; pale legs & antennae	1.9	120	14
<i>C. erythrocephala</i>	♂	black head & thorax; chestnut gaster; pale legs; brown antennae	1.7	135	16
<i>C. erythrocephala</i>	♂	orange-brown head; black thorax; brown gaster; gold legs & antennae	3.0	122	15
<i>Cynips</i>					
<i>C. agama</i>	♂	chestnut body & legs; dark antennae	3.0	154	13
<i>C. disticha</i>	♀	black head & thorax; dark brown gaster; yellow legs; darker antennae	2.9	121	14
<i>C. disticha</i>	♂	black head & thorax; dark brown gaster; yellow legs, dark antennae	2.7	145	15
<i>C. disticha</i>	♂	dark striped red-gold body; red-gold legs; dark antennae	3.3	144	13
<i>C. divisa</i>	♀	dark brown body & antennae; yellow legs	2.7	140	14
<i>C. divisa</i>	♂	brown body; yellow legs; brown antennae	2.2	158	15
<i>C. divisa</i>	♂	from bright orange to dark brown body; dark antennae; dark chestnut legs	3.4	140	13
<i>C. longiventris</i>	♀	deep brown body; translucent yellow legs; chestnut antennae	2.5	140	14
<i>C. longiventris</i>	♂	brown body; translucent yellow legs; dark antennae	2.5	145	15
<i>C. longiventris</i>	♂	chestnut head & legs; striped thorax; brown gaster; dark antennae	3.2	143	13
<i>C. quercusfolii</i>	♀	translucent yellow-brown body; yellow legs & antennae	2.3	134	14
<i>C. quercusfolii</i>	♂	dark brown body; yellow-brown legs; dark antennae	2.5	150	15
<i>C. quercusfolii</i>	♂	brown-tinged black head; black thorax; dark gaster; dark antennae & legs	3.7	135	13
<i>Neuroterus</i>					
<i>N. albipes</i>	♀	black head & thorax; dark brown gaster; yellow legs; gold antennae	1.7	147	14/15
<i>N. albipes</i>	♂	brown body, wings & antennae	1.6	145	15
<i>N. albipes</i>	♂	yellow-brown head; dark brown thorax, gaster & antennae; paler brown legs	2.5	128	15
<i>N. anthracinus</i>	♀	black body; yellow legs; dark antennae	2.2	144	15
<i>N. anthracinus</i>	♂	dark brown body; brown antennae; yellow-brown legs	3.3	131	15/16
<i>N. anthracinus</i>	♂	red-brown head; striped thorax; yellow-brown gaster; yellow legs & antennae.	2.2	133	13
<i>N. aprilinus</i>	♀	black head; dark thorax & gaster; neutral-brown antennae; yellow-brown legs	2.2	138	14
<i>N. aprilinus</i>	♂	dark brown body, legs & antennae	2.6	156	14



SPECIES	SEX	DESCRIPTION	LENGTH	RATIO%	ANT.
			MM	W/B	SEGS
<i>Neuroterus</i>					
<i>N. aprilinus</i>	♂	brown head; thorax, golden-brown translucent gaster, legs & antennae	1.3	150	13
<i>N. numismalis</i>	♀	brown body, legs & antennae	2.1	162	14
<i>N. numismalis</i>	♂	dark brown head; mid-brown thorax & gaster; test legs; pale straw antennae	1.9	141	15
<i>N. numismalis</i>	♂	black head & thorax; brown gaster; dark yellow legs; dark antennae	2.5	137	15
<i>N. quercusbaccarum</i>	♀	dark brown body; yellow legs; yellow-brown antennae	2.7	130	15
<i>N. quercusbaccarum</i>	♂	dark brown body; legs pale straw; brassy antennae	2.9	127	15
<i>N. quercusbaccarum</i>	♂	black head & thorax; dark brown gaster & antennae; brown legs, gold joints	2.5	137	15/16
<i>N. saliens</i>	♀	black body; mainly testaceous legs; black & testaceous antennae.	2.3	122	15
<i>N. saliens</i>	♂	black body; mainly testaceous legs; black & testaceous antennae; petiole.	2.0	134	15
<i>N. saliens</i>	♂	-	-	-	-
<i>N. tricolor</i>	♀	dark brown head & thorax; gold & brown gaster; gold legs; dark antennae	2.2	121	15
<i>N. tricolor</i>	♂	slender, brown body with pale petiole; yellow legs; brown antennae	2.5	140	15
<i>N. tricolor</i>	♂	black head & thorax; black & chestnut gaster; dark legs; brown antennae	2.2	140	15
<i>Trigonaspis</i>					
<i>T. megaptera</i>	♀	dark brown head, thorax & antennae; yellow-brown gaster; yellow legs	3.6	136	13/14
<i>T. megaptera</i>	♂	dark brown head; black thorax; yellow-brown gaster; yellow legs; dark ant.	2.8	158	15
<i>T. megaptera</i>	♂	mid-brown head; yellow-brown thorax, gaster, legs & antennae; WINGLESS	1.8	0	13





# Hymenopteran gall inquilines: ratios, measurements & descriptions summarised

## SEX

♀ female; ♂ male; ♂ agamic

ANT. SEGS = total number of antennal segments, from scape to tip

COLOUR = general appearance of each part

LENGTH = body length, excluding ovipositor or male organ, in millimetres

RATIO % W/B = ratio of wing length to body, as a percentage

SPECIES	SEX	DESCRIPTION	LENGTH	RATIO%	ANT
			MM	W/B	SEGS
<i>Ceroptres</i>					
<i>C. arator</i>	♀	very dark brown body; yellow-brown legs & antennae	1.7	116	13
<i>C. arator</i>	♂	very dark brown body; yellow legs & antennae	1.3	118	14/15
<i>Saphonecrus</i>					
<i>S. connatus</i>	♀	black head & thorax; brown gaster; yellow legs & antennae	1.5	114	13
<i>S. connatus</i>	♂	black head & thorax; brown gaster; yellow legs & antennae	1.4	121	15
<i>Synergus</i>					
<i>S. albipes</i>	♀	variable black to paler body; dirty gold legs; yellow antennae	1.8	113	14
<i>S. albipes</i>	♂	variable black to paler body; dirty gold legs; yellow antennae	1.5	121	15
<i>S. apicalis</i>	♀	rich brown body; yellow mouth; yellow-brown legs; dark yellow antennae	1.9	108	14
<i>S. apicalis</i>	♂	yellow head; dark brown thorax + gaster; yellow-brown legs; chestnut antennae	1.4	122	15
<i>S. clandestinus</i>	♀	dark body; tapering dark legs, gold & dark antennae	2.2	111	14
<i>S. clandestinus</i>	♂	dark body; tapering dark legs; gold & dark antennae	1.9	118	15
<i>S. crassicornis</i>	♀	black head; dark brown thorax & gaster; brown legs & antennae	2.3	101	14
<i>S. crassicornis</i>	♂	black head; dark brown thorax & gaster; gold legs & dark gold antennae	1.8	117	15
<i>S. gallaepomiformis</i>	♀	1st summer: yellow head, legs; variable antennae; black thorax; brown gaster	2.3	108	14
<i>S. gallaepomiformis</i>	♀	2nd spring: black head & thorax, chestnut gaster; yellow legs, variable antennae	2.3	108	14
<i>S. gallaepomiformis</i>	♂	1 <sup>st</sup> summer: yellow head, legs; variable antennae; black thorax; brown gaster	1.8	114	15



SPECIES	SEX	DESCRIPTION	LENGTH	RATIO%	ANT
			MM	W/B	SEGS
<i>Synergus</i>					
<i>S. gallaeopomiformis</i>	♂	2 <sup>nd</sup> spring: black head & thorax, chestnut gaster; yellow legs, variabl antennae	1.8	114	15
<i>S. incrassatus</i>	♀	gold to brown head; black thorax; chestnut gaster; gold legs & antennae	2.8	97	14
<i>S. incrassatus</i>	♂	gold or brown head; black thorax; chestnut gaster; gold legs & antennae.	2.3	103	15
<i>S. nervosus</i>	♀	yellow-brown to dark body; yellow-brown legs; yellow or brown antennae	1.9	112	14
<i>S. nervosus</i>	♂	black head /thorax; dark gaster; yellow & brown legs; golden to brown antennae	1.7	119	15
<i>S. pallicornis</i>	♀	dark or yellow-brown head & thorax; chestnut gaster; yellow legs & antennae	2.3	109	14
<i>S. pallicornis</i>	♂	yellow-brown body; yellow legs & antennae	1.6	108	15
<i>S. pallidipennis</i>	♀	black head & thorax; dark chestnut gaster & legs; gold-brown antennae	2.7	98	14
<i>S. pallidipennis</i>	♂	black head & thorax; dark gaster; bi-coloured legs; gold antennae	3.0	103	15
<i>S. reinhardi</i>	♀	black head & thorax; dark chestnut gaster; dark legs; yellow-brown antennae	3.5	95	14
<i>S. reinhardi</i>	♂	black head & thorax; dark chestnut gaster; dark legs; yellow-brown antennae	2.9	102	15
<i>S. rotundiventris</i>	♀	dark neutral brown body; mid-brown antennae & legs	1.8	113	14
<i>S. rotundiventris</i>	♂	dark neutral brown body; mid-brown antennae & legs	1.7	113	15
<i>S. ruficornis</i>	♀	black head & thorax; dark brown gaster; yellow legs & antennae	2.0	119	14
<i>S. ruficornis</i>	♂	black head & thorax; dark brown gaster; yellow legs & antennae	2.2	103	15
<i>S. thumacerus</i>	♀	variable yellow to black head; dark thorax; brown gaster; yellow legs & ant.	2.3	112	14
<i>S. thumacerus</i>	♂	yellow head, legs & antennae; black thorax; brown gaster	1.5	114	15
<i>S. umbraculus</i>	♀	brown head; black thorax; dark brown gaster; tapered legs; brown antennae	2.5	104	14
<i>S. umbraculus</i>	♂	yellow head; black thorax; dark brown gaster; tapered legs; brown antennae	2.2	110	15
<i>S. variabilis</i>	♀	Neutral brown to straw head; black thorax; dark gaster; yellow ant.; straw legs	1.7	105	14
<i>S. variabilis</i>	♂	Neutral brown to straw head; black thorax; dark gaster; yellow ant.; straw legs	1.6	107	15



# Hymenopteran gall parasitoids: ratios, measurements & descriptions summarised

Key: the columns below are an effort to provide a standard description of these colourful and varied insects, so as to make comparisons easier.

♀♂ = sex of insect

T = number of tarsal segments

R = number of antennal ring segments, or anelli

F = number of antennal funicular segments (between ring segments & club)

MET = overall appearance, whether metallic or not

Colour of a body part = general overall appearance

Colour+colour = both colours present, in patches or stripes, ie 'orange+black'

Colour-colour = the apparent overall colour, ie 'green/blue' - a green-tinged blue shade.

BODY = body length in millimetres, excluding externally visible ovipositor sheaths.

W/B% = the ratio of wing length to body length, expressed as a percentage.

O/B% = the ratio of externally-visible ovipositor sheath-length to body-length, expressed as a percentage.

Colours:

bl - black

brn - brown

choc - chocolate

grn - green

met - metallic (usually shades of green)

tapered - colour goes from dark to light in length of leg or antenna

test - testaceous, a translucent pinky-yellow colour

yel - yellow

SPECIES	♂♀	T	R	F	MET.	LEGS	ANTENNA	H+TH	GASTER	BODY	W/B	Ov/B
COLOUR										mm	%	%
<b>Eurytomidae</b>												
<b><i>Eurytoma</i></b>												
<i>E. bruniventris</i>	♀	5	1	5	no	dark	grey-brown	black	black	2.8	79	0
<i>E. bruniventris</i>	♂	5	1	5	no	black	hairy black	black	black-brown	1.9	95	-
<b><i>Sycophila</i></b>												
<i>S. bigutatta</i>	♀	5	1	5	no	black + yel	brown	black + pale	dark brown	3.4	83	0
<i>S. bigutatta</i>	♂	5	1	4	no	black + yel	mid-brown	black + pale	black	2.1	94	-
<i>S. flavicollis</i>	♀	5	1	5	no	yellow	yellow	yellow + brown	orange + brown	1.6	91	0
<i>S. flavicollis</i>	♂	5	1	4	no	yellow	yellow	yellow + brown	yellow-brown	1.6	91	-
<i>S. variegata</i>	♀	5	1	5	no	striped	brown	yellow + brn	brown + yellow	1.9	89	0
<i>S. variegata</i>	♂	5	1	4	no	brown + yel	dark	yellow + brn	brown + yellow	1.6	92	-



SPECIES	♂ ♀	T	R	F	MET.	LEGS	ANTENNA	H+TH	GASTER	BODY	W/B	Ov/B
COLOUR										mm	%	%
<b>Torymidae</b>												
<b>Megastigmus</b>												
<i>M. dorsalis</i>	♀	5	1	7	yes	yellow	yellow-brown	yellow + green	brown + yellow	3.2	98	76
<i>M. dorsalis</i>	♂	5	1	7	yes	yellow	dark brown	yellow + green	choc. + yellow	2.8	91	-
<i>M. stigmatizans</i>	♀	5	1	7	yes	yellow	dark	yellow + green	yellow	6.3	83	113
<i>M. stigmatizans</i>	♂	5	1	7	yes	yellow	dark	yellow + green	chocolate	5.2	80	-
<b>Torymus</b>												
<i>T. affinis</i>	♀	5	1	7	yes	metallic	metallic + gold	bright green	bright green	3	98	194
<i>T. affinis</i>	♂	5	1	7	yes	metallic	metallic + bronze	bright green	bright green	2.3	100	-
<i>T. auratus (= nitens)</i>	♀	5	1	7	yes	met + yel	dark	bright green	bronze-green	3.5	98	122
<i>T. auratus (= nitens)</i>	♂	5	1	7	yes	met + brn	dark	bright green	bronze	2.6	95	-
<i>T. chloromerus</i>	♀	5	1	7	yes	brn + yel	dark brassy	bright blue-grn	green-blue	2.7	97	80
<i>T. chloromerus</i>	♂	5	1	7	yes	met + yel	dark brassy	bright blue-grn	green-blue + brn	2.2	83	-
<i>T. cyaneus</i>	♀	5	1	7	yes	dark	grey-brown	green-blue	green-blue + test	3.4	97	61
<i>T. cyaneus</i>	♂	5	1	7	yes	met + yel	brassy	blue-green	dark	2.5	94	-
<i>T. erucarum</i>	♀	5	1	7	yes	met + yel	dark	purple	banded yel + brn	4.1	91	138
<i>T. erucarum</i>	♂	5	1	7	yes	met + yel	dark	purple	banded yel + brn	2.8	94	-
<i>T. fastuosus</i>	♀	5	1	7	yes	met + yel	dark	copper-green	copper	3.6	89	47
<i>T. fastuosus</i>	♂	5	1	7	yes	met + yel	dark	green	green	2.6	100	-
<i>T. flavipes</i>	♀	5	1	7	yes	yellow	brassy	gold-green	gold-green	2.5	113	58
<i>T. flavipes</i>	♂	5	1	7	yes	brown + yel	neutral	gold-green	bronze-green	2.4	100	-
<i>T. formosus</i>	♀	5	1	7	yes	brown + yel	neutral	gold + copper	copper + green	3.1	87	66
<i>T. formosus</i>	♂	5	1	7	yes	dark gold	dark	dark green	green + purple	3.4	78	-
<i>T. geranii</i>	♀	5	1	7	yes	met + yel	dark	bright blue-grn	green + test	3.4	93	98
<i>T. geranii</i>	♂	5	1	7	yes	metallic	dark	bright green	bronze	2.5	91	-
<i>T. nobilis</i>	♀	5	1	7	yes	purp + test	dark neutral	purple-green	test + purple	3.0	84	58
<i>T. nobilis</i>	♂	5	1	7	yes	purp + brn	dark	dark purple	test + purple	2.1	90	-
<i>T. notatus</i>	♀	5	1	7	yes	met + brn	gold-brown	blue-grn + copp	green-bronze	2.4	100	65
<i>T. notatus</i>	♂	5	1	7	yes	metallic	bronze	blue-grn + copp	green-brown	1.7	109	-
<i>T. roboris</i>	♀	5	1	7	yes	orange-yell	bronze	purple	purple + test	3.4	77	79
<i>T. roboris</i>	♂	5	1	7	yes	dark yellow	bronze	dark purple	bronze + orange	2.2	85	-



SPECIES	♂♀	T	R	F	MET.	LEGS	ANTENNA	H+TH	GASTER	BODY	W/B	Ov/B
COLOUR										mm	%	%
<b>Torymus</b>												
<i>T. scutellaris</i>	♀	5	1	7	yes	yellow	dark	gold-green	green + test	2.9	95	80
<i>T. scutellaris</i>	♂	5	1	7	yes	brn + yellow	brassy	dark green	brown + test	2.0	86	-
<b>Ormyridae</b>												
<b>Ormyrus</b>												
*** Ormyrus are naturally very hunched. Some collectors set them naturally, others straightened, so ratios are only an indication												
<i>O. nitidulus</i> ***	♀	5	2	6	yes	met + dark	black	dark blue-green	dark blue-grn	5.1	73	9
<i>O. nitidulus</i>	♂	5	2	6	yes	dark + met	black	dark blue-green	dark purple + grn	2.2	91	-
<i>O. pomaceus</i>	♀	5	2	6	yes	dark brown	dark	dark blue-green	bronze + green	2.7	81	4
<i>O. pomaceus</i>	♂	5	2	6	yes	dark brown	dark brown	dark blue-green	dark brown	1.8	97	-
<b>Pteromalidae</b>												
<b>Arthrolytus</b>												
<i>A. ocellus</i>	♀	5	2	6	yes	orange-brn	brassy-black	dark copper	coppery-purple	3.0	57	0
<i>A. ocellus</i>	♂	5	2	6	?	orange-brn	black	dark metallic	pale + dark	1.6	60	-
<b>Caenacis</b>												
<i>C. lauta</i>	♀	5	2	6	yes	met + yel	brassy	dark green	dark green	2.6	88	0
<i>C. lauta</i>	♂	5	2	6	yes	met + yel	brassy	dark green	brown	2.5	87	-
<b>Cecidostiba</b>												
<i>C. fungosa</i>	♀	5	2	6	yes	brown + yel	brassy	green-gold	green-bronze	2.6	78	0
<i>C. fungosa</i>	♂	5	2	6	yes	brown + yel	brassy	green	dark brown	1.9	82	-
<i>C. geganius</i>	♀	5	2	6	yes	met + test	brassy	green-bronze	green-bronze	3	68	0
<i>C. geganius</i>	♂	5	2	6	yes	brown + yel	yellow-brown	bronze-green	bronze	1.6	76	-
<i>C. semifascia</i>	♀	5	2	6	yes	brown + yel	brassy	green-gold	green-bronze	2.6	78	0
<i>C. semifascia</i>	♂	5	2	6	yes	brown + yel	brassy	green-gold	bronze-green	1.7	89	-
<b>Hobbya</b>												
<i>H. stenonota</i>	♀			6	yes	met + yel	brassy-gold	dark green	green + bronze	2.1	88	0
<i>H. stenonota</i>	♂			6	yes	met + yel	brassy	bronze-green	gold-bronze	1.8	86	-
<b>Mesopolobus</b>												
<i>M. albitarsus</i>	♀	5	3	5	yes	met + brn	pale brown	dark blue-green	Bronze-green	2.2	81	0
<i>M. albitarsus</i>	♂	5	3	5	yes	dark	gold	dark purple	bronze	1.7	88	-
<i>M. amaenus</i>	♀	5	3	5	yes	met + yel	brown + gold	golden-green	green-gold	2.6	100	0
<i>M. amaenus</i>	♂	5	3	5	yes	yellow	orange + dark	bright green	brown + test	2.0	103	-



SPECIES	♂ ♀	T	R	F	MET.	LEGS	ANTENNA	H+TH	GASTER	BODY	W/B	Ov/B	
COLOUR											mm	%	%
<b>Mesopolobus</b>													
<i>M. dubius</i>	♀	5	3	5	yes	brown + yel	brassy	dark bronze	green + brown	2.1	85	0	
<i>M. dubius</i>	♂	5	3	5	yes	yellow	yellow	bright green	grn + brn + yel	1.7	93	-	
<i>M. fasciventris</i>	♀	5	2	6	yes	yellow	yellow-brown	bright gold-grn	blue-green	2.6	90	0	
<i>M. fasciventris</i>	♂	5	2	6	yes	pale yellow	bright yellow	bright green	grn + brn + yel	1.8	94	-	
<i>M. fuscipes</i>	♀	5	3	5	yes	dark brown	brown	dark green-gold	dark green	2.3	92	0	
<i>M. fuscipes</i>	♂	5	3	5	yes	rich yellow	yellow + brn	red-gold-green	brown + yellow	1.8	103	-	
<i>M. sericeus</i>	♀	5	2	6	yes	brown + yel	olive + dark	bright green	gold-green	3.1	88	0	
<i>M. sericeus</i>	♂	5	2	6	yes	pale yellow	pale yellow	green-gold	bronze + yellow	2.1	97	-	
<i>M. tibialis</i>	♀	5	2	6	yes	mid yellow	yellow-brown	bronzed green	bronze	2.3	89	0	
<i>M. tibialis</i>	♂	5	2	6	yes	dark yellow	gold + dark	bronze + green	bronze + yellow	1.7	94	-	
<i>M. xanthocerus</i>	♀	5	3	5	yes	brown + yel	brassy	golden-green	dark bronze	2.1	98	0	
<i>M. xanthocerus</i>	♂	5	3	5	yes	brown	yellow + dark	bright green	met + yellow	1.7	98	-	
<b>Ormocerus</b>													
<i>O. latus</i>	♀	5	2	6	yes	metallic	metallic	green-gold	bronze-green	1.8	95	0	
<i>O. latus</i>	♂	5	2	6	yes	metallic	metallic	dark green	bronze-green	1.4	112	-	
<i>O. vernalis</i>	♀	5	2	6	yes	metallic	dark	blue-green	green	2.3	85	0	
<i>O. vernalis</i>	♂	5	2	6	yes	metallic	dark	blue-green	blue-green	1.5	103	-	
<b>Eupelmidae</b>													
<b>Eupelmus</b>													
<i>E. annulatus</i>	♀	5	1	7	yes	brn + yellow	Dark neutral brn	dark metallic	dark metallic	2.3	78	27	
<i>E. annulatus</i>	♂	5	1	7	yes	purple + brn	dark brassy	dark green	brown-green	1.8	?	-	
<i>E. urozonus</i>	♀	5	1	7	yes	dark met.	very dark	dark green	dark green	2.7	80	18	
<i>E. urozonus</i>	♂	5	1	7	yes	purple + brn	dark brassy	dark green	brown-green	1.8	78	-	
<i>E. vesicularis</i>	♀	5	1	7	yes	brn + yellow	Dark brassy	dark olive met.	dark + testaceous	2.8	0	13	
<i>E. vesicularis</i>	♂	5	1	7	yes	brn + yellow	Very dark	dark metallic	Dark bronze-grn	1.6	80	-	
<b>Eulophidae</b>													
<b>Aprostocetus</b>													
<i>A. aethiops</i>	♀	4	2	3	yes	dark + yel	straw	black	black	2	100	0	
<i>A. aethiops</i>	♂	4	2	3	yes	dark + yel	brown	black	dark	1.2	108	-	



SPECIES	♂ ♀	T	R	F	MET.	LEGS	ANTENNA	H+TH	GASTER	BODY mm	W/B %	Ov/ B %
<b>Aulogymnus</b>												
<i>A. arsames</i>	♀	4	2	3	yes	brown + yel	gold-brown	bronze-green	dark brown	2.1	81	0
<i>A. arsames</i>	♂	4	2	4	yes	brown + yel	mid brown	bronze + green	bronze-brown	1.8	82	-
<i>A. euedoreschus</i>	♀	4	2	3	yes	met + gold	yellow-brown	green + gold	dark green	2.9	81	0
<i>A. euedoreschus</i>	♂	4	2	4	yes	met + gold	pale brassy	dark met/green	green + copper	2.0	90	-
<i>A. gallarum</i>	♀	4	2	3	yes	brown + yel	dark brassy	dark bronze-grn	bronze-green	2.3	81	0
<i>A. gallarum</i>	♂	4	2	4	yes	brown + yel	brassy	dark green	brown + green	1.8	82	-
<i>A. gallarum f. pulchellum</i>	♀	4	2	3	yes	brown + yel	mid-brown	dark green	brown + green	2.2	91	0
<i>A. gallarum f. pulchellum</i>	♂	4	2	4	yes	brown + yel	dark	dark green	brown + green	2	98	-
<i>A. skianeuros</i>	♀	4	2	3	yes	met + yel	gold-brown	dark gold-green	dark green	2.8	78	0
<i>A. skianeuros</i>	♂	4	2	4	yes	met + yel	neutral brown	dark green	green-brown	2.1	84	-
<i>A. trilineatus</i>	♀	4	2	3	yes	met + yel	dark yellow	bright green	bright green	3.8	84	0
<i>A. trilineatus</i>	♂	4	2	4	yes	brown + yel	dark neutral	dark green	dark green	2.9	85	-
<b>Baryscapus</b>												
<i>B. diaphantus</i>	♀	4	2	3	yes	brown + yel	brassy-gold	dark bronze	dark bronze	1.4	90	10
<i>B. diaphantus</i>	♂	4	2	4	yes	brown + yel	brassy-gold	dark green	brown + green	1.1	92	-
<b>Pediobius</b>												
<i>P. clita</i>	♀	4	1	3	yes	met + white	metallic	bright green	purple + green	1.8	77	0
<i>P. clita</i>	♂	4	1	2	yes	met + white	metallic	bright green	dark green	1.6	76	-
<i>P. lysis</i>	♀	4	1	3	yes	met + dark	metallic	bright green	purple + bronze	1.6	87	0
<i>P. lysis</i>	♂	4	1	2	yes	met + dark	metallic	purple-green	purple + blue	1.5	89	-
<b>Quadristichus</b>												
<i>Q. anysis</i>	♀	4	1	3	no	pale yellow	straw-coloured	dark + yellow	neutral + yellow	0.95-1.2	?	0
<i>Q. anysis</i>	♂	4	1	4	no	pale yellow	straw-coloured	dark neutral	neutral + yellow	0.9	114	-
<b>Tamarixia</b>												
<i>T. pubescens</i>	♀	4	1	3	no	Banded	straw	black	black	1.3	114	0
<i>T. pubescens</i>	♂	4	1	4	no	banded	straw	black	black	1.2	124	-



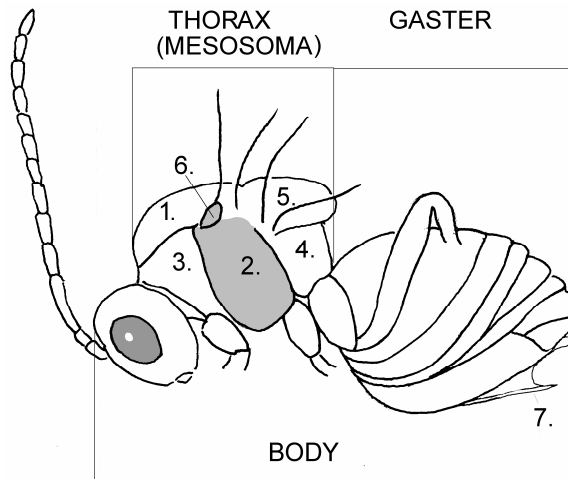
SPECIES	♂ ♀	T	R	F	MET.	LEGS	ANTENNA	H+TH	GASTER	BODY mm	W/B %	Ov/ B %
<b>Ichneumonidae</b>												
<b><i>Gelis</i></b>												
<i>G. areator</i>	♀	5	22sg	no	chestnut	chestnut	bl + chestnut	brn + chestnut		4.3	82	21
<i>G. areator</i>	♂	5	?sg	no	?	?	?	?		?	?	.
<i>G. formicarius</i>	♀	5	24sg	no	red-yellow	red + black	red + black	black + red		3.0	0	24
<i>G. formicarius</i>	♂	5		no	test	dark	black	dark + pale		3.3	91	.
<b><i>Mastrus</i></b>												
<i>M. deminuens</i>	♀	?	? ?	no	black + red	test + brown	black + red	black + red		?	?	?
<i>M. deminuens</i>	♂	?	? ?	no	black + red	black + red	black + red	black + red		?	?	.
<b><i>Scambus</i></b>												
<i>S. planatus</i>	♀	5	23segs	no	test + white	dark brown	black	black		6.6	96	72
<i>S. planatus</i>	♂	5	25segs	no	test + white	dark brown	black	black		7.4	67	.
<b>Diapriidae</b>												
<b><i>Spilomicrus</i></b>												
<i>S. stigmatalis</i>	♀	5	13 segs	no	Dark + pale	black	black	black		2.8	90	0
<i>S. stigmatalis</i>	♂	5	13 segs	no	Dark brown	black	black	black		2.9	104	.





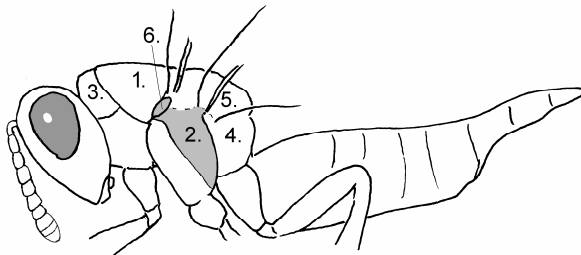
## C. Glossary of technical terms

### Some general structural drawings



CYNIPID CONVENTION (as used here) – see glossary for ‘thorax/mesosoma’ ♀

1. Mesoscutum
2. Mesopleuron
3. Pronotum
4. Propodeum
5. Scutellum
6. Tegula
7. Ventral spine



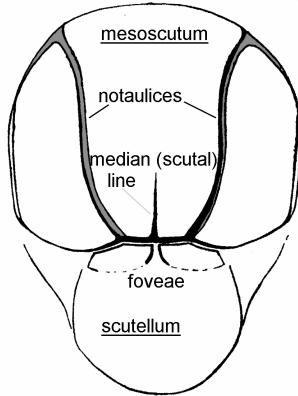
CHALCID CONVENTION (as used in this work) ♀

1. Mesoscutum
2. Mesepimeron
3. Pronotum
4. Propodeum
5. Scutellum



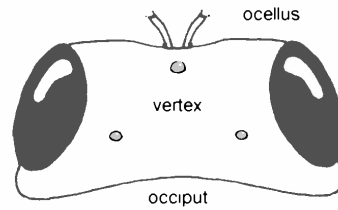
6. Tegula

(front)

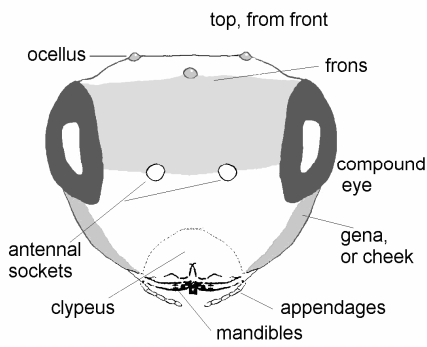


thorax (from above)

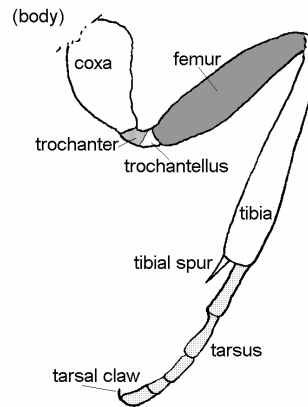
(front)



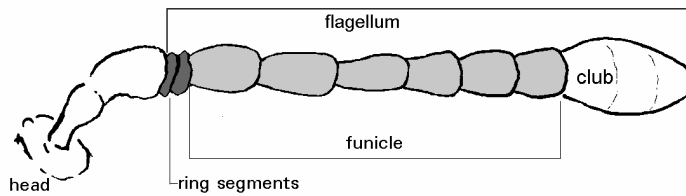
head (from above)



head (from front)



leg



an antenna drawn to show the different components, (though they may not be



found together in all species)



## Some important terms & information

It should not be necessary to have a separate dictionary at hand to understand these keys, as much effort has gone into simplifying terms and using the minimum of what might be described as 'jargon'. A full explanation of terms is generally given through drawings within the key.

In addition, anatomical drawings of cynipids are shown in Volume one, on pp 86 & 87; of chalcids on p. 174, and more general drawings on p. A187 of this volume.

However, a brief outline of the terms used are listed below, where either an explanation is needed for biology/behaviour, or specialist forms of use are unavoidable. Terms in **bold** are nouns & are used for body parts; normal text is used for descriptive terms with particular entomological usage.

### GLOSSARY

♀ - female, sexual generation

♂ - male

♀♂ - sexual generation

**♂** - agamic, or asexual, generation; agamic female

**ABDOMEN** - the main rearmost division of the body, behind the leg-bearing segments. In Apocrita (Parasitica), the first segment (propodeum) is attached to the thorax and the apparent abdomen becomes known as the gaster.

**ABSCISSA** - segment of a wing-vein between where other veins join it.

**ACICULATE** microsculpture - see drawings p. 199.

**ACUTE** - sharp, an angle of less than 90°

**ACUTE TRIANGLE** - a long, narrow, sharply-pointed, triangle

**ALUTACEOUS** microsculpture - see drawings p. 199.

**ANTENNAE** - a pair of multi-segmented 'feelers', set into the face, which act as sensory organs.

**ANTENNAL CLUB** - the final segments of the antenna, not always easily distinguished - but persist! Often three segments, but these may be fused, or near fused, into one apparent body.

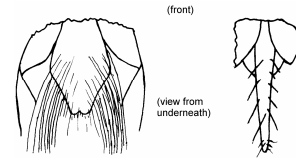
**ANTERIOR** - at the front.

**APPENDAGES** - in this context, refers to visible mouthparts, not mandibles.



**APICALLY** - at the end furthest from a part's attachment point.

**APICAL TUFT** - in cynipid females, the ventral spine may often has distinct tufts of hair which help distinguish one species or genus from another. \*

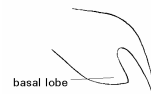


**AREOLET** - a characteristic cell, often triangular or rounded, in the middle of a cynipid or ichneumon wing.

**AXILLARY bud** - arising at the point where a branch leaves the stem or trunk of a plant or tree.

**BASAL CELL** - at the base of the forewing, behind the radial vein.

**BASAL LOBE** - a projecting bulge on the claw of some insects.\*



**BASAL TOOTH of claw** - some hymenoptera have a tooth on the claw, or even have the claw split in two at the end.

**BASAL VEIN** - an often near invisible vein arising from junction of parastigma and sub-marginal vein, running down to near the far side of the wing.

**BRISTLES** - ultra-stiff, thick, tapered socketed hairs.

**CARINA** - a ridge or raised line on the cuticle.

**CHEEK (Gena)** - the area between the bottom of the eye and the mandibular socket/clypeus.

**CLAW** - found at the end of the tarsus.

**CLYPEAL (MEDIAN) INCISION** - an indentation or full-blown incision in the lower margin of a clypeus; important for identifying some Pteromalidae. \*



**CLYPEUS** - a structure just above the mouth opening, defined by a groove.

**COMPOUND EYE** - the full name for the main eye which is made up of many facets, or ommatidia, which are visible under the microscope or in high resolution photographs.

**CONCAVE** - a structure with a sunken centre or profile.

**CONVEX** - a domed structure or profile.

**CORIACEOUS microsculpture** - see drawings p. 199.

**COSTAL VEIN** - heavy vein running along the front edge of the forewing; not present in chalcids. \*



**COXA** - top segment of the leg, next to the body.

**CUTICLE** - outer skin (the skeleton in insects lies outside)



**DECUMBENT** hairs - lie flat along the surface of the cuticle.

**DISC** - the central surface of a structure.

**DISTAL (SPOT)** - at the extremity or edge, away from the point of origin.

**DORSAL** - top of a structure, on the back.

**EMARGINATE** - a notched margin.

**EXCAVATE** - hollowed.

**FACE** - that area below the antennal sockets down to the edge of the clypeus.

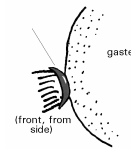
**FEMUR** - 3<sup>rd</sup> segment of the leg, between trochanter & tibia.

**FILIFORM** - thread-like (as in antennae)

**FLAGELLUM** - 3<sup>rd</sup> sub-division of the antenna, from tip to end of pedicel; with **SCAPE** & **PEDICEL**.

**FLEXOR ASPECT** - the side of a limb containing the muscle, or showing a muscular bulge, as in a tibia.

**FIRST GASTRAL SEGMENT** - in cynipid inquilines species, this is a scale-like part of the petiole on which the presence or absence of microsculpture may be important for identification. \*



**FOVEAE (scutellar)** - pits or shallow depressions between the mesoscutum & scutellum; may be separated or merged into a single fovea, or not exist at all.

**FOVEOLATE** microsculpture - see drawings p. 199.

**FRONS** - Top of the head, between the compound eyes, extending from the front ocellus down to the base of the antennae.

**FUNICLE** - that part of the antenna between the club and the pedicel.

**FURROW** - indented line in the cuticle.

**FUSCOUS** - of a dark hue, sombre.

**GASTER** - 3<sup>rd</sup> separate part of the body in Apocrita, with the **HEAD** and **THORAX**.

**GENAE** - cheeks, the area between the bottom of the compound eye and the socket of the mandible.

**GENAL FURROW** - a furrow running from the bottom of the compound eye to the base of the mandible.

**GRANULATE** microsculpture - see drawings p. 199.

**HAIR** - fine, soft filament growing from the cuticle.

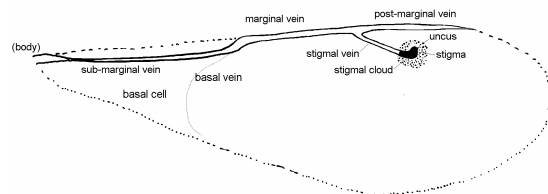


**LABRUM** - a flap behind the clypeus which may be exposed beneath it, or hidden behind it.

**MALAR SPACE** - the minimum distance between an eye and a mandible base.

**MANDIBLES** - biting jaws hinged at bottom corners of the clypeus.

**MARGINAL VEIN** - seen here as a vein on the wing-margin of chalcids.



**MAXILLARY PALPS** -

segmented 'feelers' attached to the mouthparts.

**MEDIAN** - the middle of an area or structure.

**MEDIAN SCUTAL or THORACIC LINE** - a longitudinal line which divides the mesoscutum, starting from the back, often shortened to **MEDIAN LINE**.

**MESEPIMERON** - a subdivision or plate of the mesopleuron (or side of the thorax), directly below where the wings joins the structure; often an important feature in chalcid identification - see diagram on p. 197.

**MESONOTUM** - Top of the mesothorax

**MESOPLEURON** - the sides and underside of the mesothorax, used here to identify particularly the side below the wing.

**MESOScutum** - that part of the mesonotum which excludes the scutellum.

**MESOSOMA** - the correct term for the middle section of the insect body consisting of pronotum + mesoscutum + propodeum, or more properly 'thorax + propodeum'. However, many previous works and keys (as in the RES Cynipid keys) call the mesosoma the 'thorax'; for clarity this convention has been used throughout this work.

**MESOTHORAX** - the largest subdivision of the thorax, which bears the first two pairs of legs and forewings, where present.

**MICROSCULPTURE** - the markings raised or carved into a surface, often between major sculptures such as carinae. Strictly used to refer to minute sculpturing between normal sculpture but has come to be used to describe the various recognised forms of sculpture such as rugose, reticulate or coriaceous - see drawings p. 199. However, in some parts of the key there are references to microsculpture which clearly mean the minute sculpture between other sculpture .



**NOTAULICES** - a pair of grooves on the mesoscutum, dividing it into top and sides, which very important for identification.

**O.O.L.** - the distance between the outer edge of the rear ocellus and the edge of the closest compound eye.

**OBTUSE** - an angle of more than 90°.

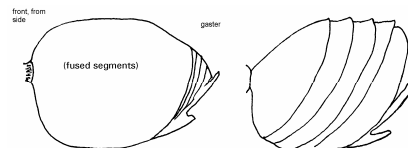
**OCCIPITAL CARINA** - a ridge on the back of the head separating the occiput from the cheeks & vertex; its presence and strength can be an important feature for identification of some species.

**OCCIPUT** - the back of the head, inside the occipital carina, where present.

**OCELLI** (OCELLUS, singular) - simple eyes, usually three in number, on top of the head.

**OCELLAR TRIANGLE** - the shape formed by imaginary lines joining the three ocelli on the top of the head. The relative acuteness or otherwise of this triangle may be an important aid to identification.

**ONE 'MAIN' GASTRAL SEGMENT** - in cynipids, some appear to have one major segment, when seen from the side, others are distinctly and evenly segmented. \*



**OVIPOSITOR** - thin, paired structures protected by a pair of **sheaths**, used for laying eggs. In cynipids and some chalcids this may live inside the gaster, in other chalcids it is permanently extended out from the body, protected by the stiff outer sheaths.

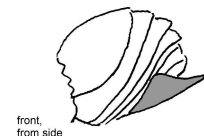
**PAPILLATE** microsculpture - see drawings p. 199.

**PEDICEL** - 2<sup>nd</sup> division of antenna, between scape & flagellum.

**PETIOLE** - the joint between the propodeum and the gaster, sometimes elongated into a stalk, when it is described as petiolate.

**PLEURON** - side part of a body segment.

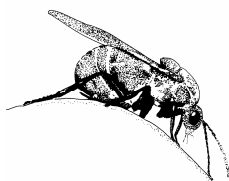
**'PLOUGHSHARE'** - The characteristic exaggerated shape, at the bottom and back of some cynipid gasters, which helps with recognition. \*



**P.O.L.** - distance between the inner margins of the two outer ocelli.

**POSTERIOR** - the back of a structure.

**POST-MARGINAL VEIN** - in chalcids, that part of the vein running along the front of the forewing beyond the stigmal vein - see p. 192





**POST-ORBITAL REGION** - the area between the back of an eye and the back of the head, when seen from above; it may be wide or narrow.

**PRONOTAL COLLAR** - the horizontal part of the pronotum, as opposed to the sloping part; bounded by a transverse groove at back.

**PRONOTUM** - a plate at the very front, between head & rest of thorax.

**PROPODEUM** - the first tergite of the abdomen in Apocrita, fused to the thorax, and joined flexibly to the gaster.

**PUNCTATE** microsculpture - see drawings p. 199.

**PUNCTATE** area - a part of the cuticle with obvious pits or sharp depressions.

**PUNCTULATE** microsculpture - see drawings p. 199.

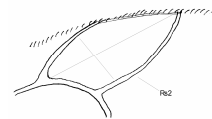
**PUNCTURATION** - a descriptive term used sometimes for an area covered with punctures.

**PUNCTURES** - pits in the cuticle.

**PUBESCENT** - fine, short, flattened hairs having the appearance of fur.

**PUSTULATE** microsculpture - see drawings p. 199.

**RADIAL CELL** - in cynipids, an open or closed cell on the edge of the forewing furthest from the root. \*



**RETICULATE** microsculpture - see drawings p. 199.

**RING SEGMENTS** (or ANNELLI) - very short segments found in some chalcids, between the pedicel and the funicle, without sensillae on the surface.

**RUGAE** - wrinkles.

**RUGOSE** microsculpture - see drawings p. 199.

**RUGULOSE** microsculpture - see drawings p. 199.

**SCULPTED/SCULPTURE** - the pattern of lines, pits or raised portions on the surface of the cuticle.

**SEGMENT** (ANTENNAL) - the antenna is divided up into a number of segments of differing types and shapes; the first is closest to the head.

**SEGMENT** (GASTRAL) - the various parts of the gaster, numbered from the front. Although the first 'true' segment is actually attached to the thorax in Apocrita, convention decrees that the gastral segments start at 1, nearest the junction with the thorax. In Cynipids, the segments may be free or several apparently fused to produce one major segment; this is an important feature in identification.

**SEGMENTED GASTER** - in cynipids, in particular, clearly shows the different segments evenly along the side, as opposed to 'one main segment'.



**SENSILLA** (SENSILLAE plural) - sense organs found on some antennal segment; seen as short longitudinal raised lines.

**SETAE** - slender sense organs, like hairs but tapered and joined to the cuticle by a socket. Spines are even more definite and stronger in appearance.

**SCAPE** - the first, basal segment of the antenna, which sets into the socket on the face.

**SCULPTURE** - markings either engraved into the cuticle or raised above it in the form of a pattern.

**SCUTELLAR FOVEAE** - paired pits in the cuticle, between the scutellum and mesoscutum; they may be shallow and fused together or clearly separated and deep.

**SCUTELLUM** - the rear of the mesonotum, behind the mesoscutum; an obvious rounded plate on top.

**SETAE** - jointed sense-organs, like slender, tapered hairs.

**SHAGREENED** - rough skinned, with finely toothed surface, like miniature shark-skin.

**SIMPLE** (as in tibia) - without extraneous projections.

**SPECULUM** - hairless area on chalcid forewings, near the base.

**SPINE** - like a thick hair but tapered, stout and joined to the cuticle by a socket

**SPUR** - a spine found typically on a tibia, though they may also occur on other parts of the leg.

**STERNITE** (GASTRAL) - the lower plates that make up the segments of the gaster.

**STIGMA** - knob-like enlargement of the stigmal vein in chalcids. \*

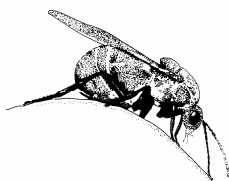
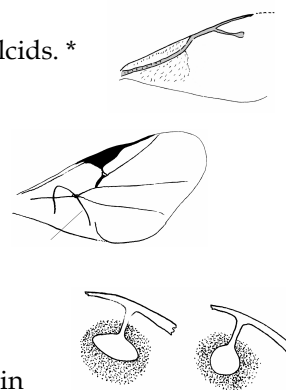
**STIGMA** - a quite different meaning for ichneumons & Diapriidae, as well as many other hymenoptera; a darkly pigmented and thickened area of the forewing, on the front margin, at the apex of the costal vein. \*

**STIGMAL CLOUD** - pigmentation surrounding the stigma on some Chalcids. It is important not to confuse the cloud with the stigma itself. \*

**STIGMAL VEIN** - branch off the marginal vein, projecting in from the margin.

**STRIAE** - near-parallel lines/furrows on the cuticle.

**STRIATE** microsculpture - see drawings p. 199.

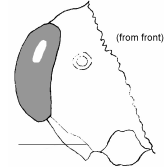


STRIGOSE microsculpture - see drawings p. 199.

SUB-EQUAL - not quite equal, as in length of antennae.

**SUB-MARGINAL VEIN** - that part of the front vein in chalcids which is closest to the base and parallel to, but not on, the margin of a forewing.

**SUB-OCULAR GROOVE** - extends from the lower margin of the eye to the point where the mandible articulates with the face. \*



SUB (PARALLEL) - almost 'parallel'.

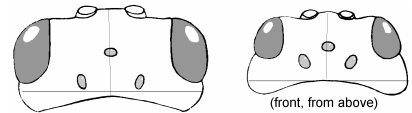
**SULCUS** - furrow or groove.

**TARSUS** - the final part of a leg, four or five segmented and ending in claws.

**TARSAL CLAW** - pointed structures on final tarsal segment of the leg.

**TEGULA** - tile-like structure that covers the point where the wing joins the wing-base.

**TEMPLES** - when the head is looked at from above, the temples are the areas behind the eyes at the edge. Keys refer to these 'projecting beyond the eyes, being level with them, wider, or narrower', and are important recognition points in cynipids. \*



**TERGITE (GASTRAL)** - the upper plates that make up the gastral segments.

**TESTACEOUS** - translucent pinky brick-red, or dark skin-coloured; a shade difficult to describe but obvious once seen and its translucence noted.

**THIRD ANTENNAL SEGMENT in cynipids** - this segment has significance for recognition; in males it is often distorted, while females also have characteristic lengths and thickness in relation to other segments.

**THORAX** - middle section of the body, with GASTER & HEAD.

**TIBIA** - 4<sup>th</sup> segment of the leg, between femur & tarsus.

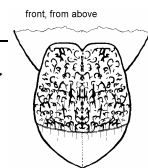
**TIBIAL SPUR** - stout spine angled out from the bottom of the tibia. Whether single or double, and relative lengths, are important features in the identification of chalcids.

**TRANSFACIAL LINE** - the shortest distance between the antennal sockets.

**TRANSLUCENT (COLOUR)** - transmits light through it, but obscures detail beneath the surface.

**TRAPEZOIDAL head** - a roughly four-sided shape when seen from the front.

**TRANSVERSE (as in RUGAE or GROOVE)** - running across the body, or a part of a body.



**TRANSVERSE FURROW** - divides the front from the back of the scutellum of some *Torymus* species, separating two different types of surface sculpture - an important identification feature in this genus. \*

**TRANSVERSE SEGMENTS** - a totally different meaning for transverse; antennal segments that are wider than long.

**TROCHANTELLUS** - gives the appearance of a small segment at the lower end of the trochanter but is, in fact, the upper end of the femur - when it is present.

**TROCHANTER** - 2<sup>nd</sup> segment of the leg, between coxa & femur.

**UNCUS** - point on stigma in some chalcids

**VENTRAL SPINE of gaster** - point of the final plate beneath the gaster (sternite); the length this extends beyond the end of the last sternite is one of the means of identifying Cynipid species.

**VERTEX** - between the eyes on top of the head, extending from the occiput to the front ocellus.

**WEAKLY** (as in 'reticulate') - lightly delineated, barely visible, as opposed to 'strongly or coarsely'.

## BEHAVIOURAL TERMS

**AGAMIC & SEXUAL GENERATIONS** - the agamic, asexual, generation consists only of females, which produce fertile eggs without the benefit of male fertilisation. Unlike some other Hymenoptera, ♂ cynipids produce both males and females from their eggs. The ♀ ♂ generation consists of normal males and females combining to produce fertile eggs. Many cynipid causers' have two separate, and different-looking, insect generations which produce quite different galls, sometimes even on different host-trees. For example, *Andricus quercuscalicis* ♂ causes the spiny 10mm long Oak-knopper gall, on *Quercus robur/petraea* acorns, whereas the sexual generation produces a 2mm catkin gall on *Q. cerris*, the Turkey oak. The golden-brown ♂ insect is nearly 5mm long, while the mostly black ♀ ♂ are around 1.4mm long.

**CAUSER** - an insect which triggers the production of a gall; in the case of a gall wasp, by the hatching of its egg inside the plant tissues.

**CYNIPIDS** - common name for hymenopteran gall-causers or inquilines from the family Cynipidae

**ECTOPARASITOID** - a parasitoid whose larva develops outside the host, by feeding through the skin.

**ECTOPHAGOUS (larva)** - feeding on outside of insect host, but on its tissues.



**ENDOPARASITOID** - a parasitoid whose larva develops and feeds inside the host.

**ENDOPHAGOUS (larva)** - feeding within an insect host.

**GALL-WASP** - hymenopteran gall-causer or inquiline from the family Cynipidae.

**GENERATIONS (SPRING or SUMMER)** - some cynipids have spring and summer generations, emerging, for example, in the first summer and second spring. Colouring may differ between these generations.

**INQUILINE** - a guest inside a gall, which does not intend to kill the host (through this may occur due to the inquiline eating its food store).

**PARASITOID** - an insect that lives as a parasite (feeding off its hosts tissues) during some or all of its young stages, but having a free-living adult stage. The parasitoid larva eventually kills the host.

**SEXUAL FORMS** - where male and female are required in order to produce young (see **agamic** for opposite).

## CLASSIFICATION OF HYMENOPTERA

(showing only relevant families)

SUB-ORDER SYMPHYTA (Sawflies & Wood-wasps)

SUB-ORDER APOCRITA (Wasp-waisted hymenoptera)  
(PARASITICA)

**Cynipoidea:** Cynipidae.

**Chalcidoidea:** Eurytomidae, Torymidae, Ormyridae, Pteromalidae, Eupelmidae, Eulophidae.

**Proctotrupeoidea:** Diapriidae.

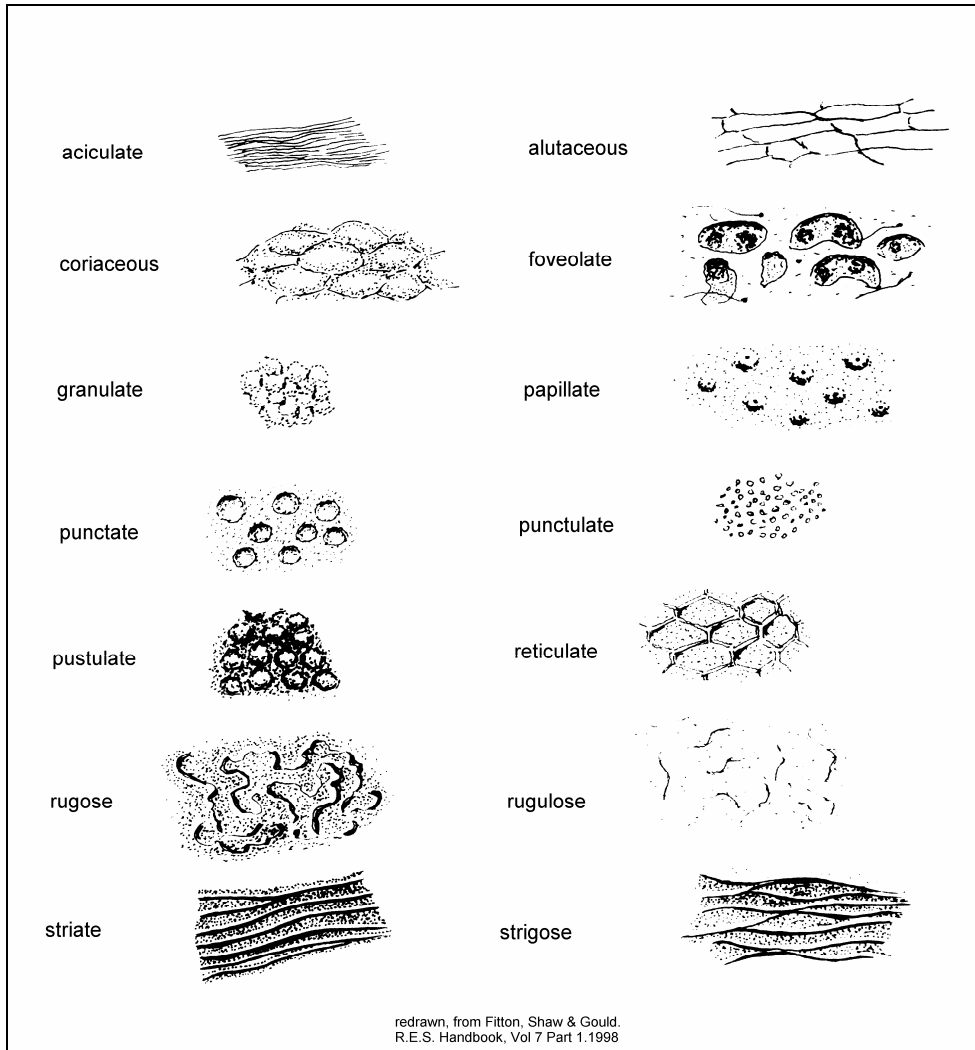
**Ichneumonoidea:** Ichneumonidae.

(ACULEATA) - bees, wasps & ants

(a full glossary of the majority of terms used in determining all British Hymenoptera is available from the same publisher/address: 'British Hymenoptera - Glossary for use with identification keys', by Robin Williams.)



# Some typical microsculpture



## **D. Sources of information**

### **Some useful addresses**

In studying galls, it is more than useful to have access to the right working materials. I have been fortunate to discover reliable sources, through luck or advice from others. Here they are:

### **Suppliers**

B & S ENTOMOLOGICAL SERVICES (previously MARRIS HOUSE NETS)  
37 Derrycarne Road  
Portadown  
Co. Armagh  
Northern Ireland BT62 1PT  
028-3833 6922

**suppliers of a variety of entomological nets and netting for rearing**

BRUNEL MICROSCOPES  
Unit 2,  
Vincents Road,  
Bumpers Industrial Estate  
Chippenham  
Wilts SN14 6NQ  
01249-462655  
E-mail: 101353.3301@compuserve.com

**helpful & friendly, good range of moderately-priced, quality stereo instruments, new & second-hand.**

D.J. & D. HENSHAW  
34, Rounton Road  
Waltham Abbey  
Essex EN9 3AR  
01992-717663  
E-mail: djhagro@aol.com

David Henshaw; most helpful;  
**chemicals & pins**, tubes, other biological equipment

LAKELAND MICROSCOPES  
Holly Bank  
Windermere Road  
Lindale, Grange-over-Sands  
Cumbria LA11 6LB  
015395-34737  
Lakeland@uk-scientific.co.uk

the full range of **moderately-priced** Russian microscopes.

MEADOW LABORATORIES  
18 Avenue Road  
Chadwell Heath  
Romford  
Essex RM4 4JF  
0208-5971203

suppliers of **gelatine capsules**.

MEIJI TECHNO  
The Vineyard, Hillside,  
Axbridge, Somerset BS26 2AN  
01934-733655  
e-mail: meijitechno.co.uk

**suppliers of the Meiji range of microscopes, video equipment & lighting.** Richard Fry is extremely helpful.



WATKINS & DONCASTER  
PO Box 5, Cranbrook,  
Kent TN18 5EZ  
01580-753133  
E-mail: Robin.Ford@Virgin.net

suppliers of **biological bits and pieces**, **card**, tubes, boxes, nets.

**Bold** words in descriptions show items for which a supplier is particularly useful.

## Societies & specialist organisations

### BRITISH PLANT GALL SOCIETY (BPGS)

Hon Secretary, Graeme Clayton  
2, the Dene,  
Lincolnshire LN2 2LS  
01522-875939  
website - <http://www.btinternet.com/~bpgs/>

The society for those interested in and seeking further information on plant galls in Britain. They have recently formed a section to, hire study insects in galls. They hold an annual gall-weekend, in the field.

### BRITISH ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY (BENHS)

Pelham-Clinton Building  
Dinton Pastures Country Park  
Davis Street, Hurst, Reading  
Berks RG10 0TH  
E-mail (Secretary) [jmuggleton@compuserve.com](mailto:jmuggleton@compuserve.com)

A leading society for both amateurs and professionals, with an excellent study centre and collection at HQ. They run workshops and sponsor research by individuals.

### MANCHESTER MICROSCOPICAL & NATURAL HISTORY SOCIETY

Hon. Secretary, M. Elsworth  
7 Hall Lee Drive, Westhaughton,  
Friendly & Manchester M27 5QJ Bolton BL5 3EQ  
01942-818506  
e-mail: [mtn.elsworth@iee.org](mailto:mtn.elsworth@iee.org)

A society for the microscopical beginner, or expert, wherever you live. Helpful; first-class newsletter, with secondhand list. A **must** for anyone wanting to learn about microscopy.

### ROYAL ENTOMOLOGICAL SOCIETY (RES)

41 Queen's Gate  
London SW7 5HR  
0171-584 8361  
E-mail: [reg@royensoc.demon.co.uk](mailto:reg@royensoc.demon.co.uk)

The premier society for those involved in entomology. Holds periodic joint meetings with the BPGS.

### RES Insect Parasitoid Special Interest Group

Organiser: Peter Mayhew  
E-mail [pjm19@york.ac.uk](mailto:pjm19@york.ac.uk)

An important meeting point for those interested in these insects. They run an annual meeting and discussion group.





## **People – a special thank-you to those who have been so helpful in guiding this project on its way.**

**Dick Askew** – for numerous personal communications, checking identifications, encouraging progress and allowing me the use of his keys, which form the bedrock of the work. He has been kinder and more helpful than I would have thought possible, as well as allowing me access to his personal collection.

**Ray Barnett, of the City Art Gallery & Museum, Bristol** – for encouragement in starting this project.

**The late John Boyd, and the members of the West Mendip Invertebrate Group** – without whom this interest would never have started.

**Michael Chinery, and other members of the British Plant Gall Society**, for their practical help.

**Professor Mike Claridge of the RES** - for support and encouragement of the project.

**Hewett Ellis** - for his valuable contribution through rearing gall insects, and commenting on this work.

**Philip Entwistle** of Sutherland – for much valuable information on oak galls and their inhabitants, and encouraging progress on the book

**John Ismay** – for help in understanding the collection at the Oxford University Museum and for sending me galls to rear.

**Malcolm Jennings** – for sending many galls & their insect inhabitants for examination and measurement. His skills in rearing, and enthusiastic help, have been much appreciated.

**Robert Maidstone** – for helping unravel the mysteries of sexual galls on Turkey-oaks.

**George Melika** in Hungary – for special help with identification of *Synergus variabilis*.

**George McGavin** – for allowing access to the chalcids & cynipids at the Oxford University Museum.

**John Noyes** – for letting me look at the cynipid and chalcid collections at the Natural History Museum, London, and for ongoing advice. Also **Suzanne Lewis** for arranging the loan of specimens.

**Chris Raper** – for specimens & giving useful & practical feedback.

**Karsten Schönrogge** – for assistance in understanding progress of the newer oak-galls and their inhabitants as they spread in this country.

**Graham Stone** - for practical encouragement, involvement with the European oak-gall project and the loan of specimens, as well as allowing access to the latest keys to European chalcids so carefully prepared by Dick Askew & Csaba Thuroczy; also up-to-date information on cynipid classification.

**Pat Walker** – who has been so helpful and kind in lending me specimens and telling me about progress with her own research at Silwood Park. Without her help, this work would have been delayed considerably and not been nearly so well-informed about the latest developments.

**Mike Wilson** – for giving access to the Hymenopteran collections of the National Museum and Gallery, Wales, at Cardiff. His continuing support and advice has been enormously appreciate

## **Support**

I am grateful also to the **British Entomological and Natural History Society** for a grant to help in travelling, under the auspices of the BENHS RESEARCH FUND.



## **Publications - articles**

R.R. Askew: **PARASITOID OVIPOSITION IN THE FALSE CHAMBER OF THE GALL OF *CYNIPS DISTICHA* HARTIG (HYMENOPTERA, EURYTOMIDAE, CYNIPIDAE)**. Entomologist's Monthly Magazine; Vol. 135 29<sup>th</sup> November (1999)

R. R. Askew and M. P. Neill: **PARASITOID AND INQUILINES OF THE AGAMIC GENERATION OF *ANDRICUS LIGNICOLA* (HYMENOPTERA, CYNIPIDAE) IN BRITAIN**. The Entomologist - 112 (1), 43-48 (1993).

R.R. Askew; **SOME BIOLOGICAL NOTES ON THE PTEROMALID (HYMENOPTERA, CHALCIDOIDEA) GENERA *CAENACIS* FÖRSTER, *CECIDOSTIBA* THOMSON & *HOBBYA DELUCCI*, WITH DESCRIPTIONS OF TWO NEW SPECIES**. Entomophaga, Tome VI, No. 1, 57-67. (1<sup>er</sup> trimestee 1961)

R. R. Askew; **OBSERVATIONS ON THE BRITISH SPECIES OF *MEGASTIGMUS DALMAN* (HYMENOPTERA, TORYMIDAE) WHICH INHABIT CYNIPID OAK GALLS**. The Entomologist, 124-129. (May 1966).

R. R. Askew; **THE BIOLOGY OF THE BRITISH SPECIES OF THE GENUS *TORYMUS DALMAN* (HYMENOPTERA, TORYMIDAE) ASSOCIATED WITH GALLS OF CYNIPIDAE (HYMENOPTERA) ON OAK, WITH SPECIAL REFERENCE TO ALTERNATION OF FORMS**. Transactions of the Society for British Entomology. Vol. 16, Part 1X, 217-232. (April 1965).

R.R. Askew; **ON THE BIOLOGY OF THE INHABITANTS OF OAK-GALLS OF CYNIPIDAE (HYMENOPTERA) IN BRITAIN**. Transactions of the Society for British Entomology - Vol 14, Part XI, 237-268, (Nov 1961) - with special thanks for permission to use keys from this.

R.R. Askew; **SOME BIOLOGICAL NOTES ON THE PTEROMALID (HYM., CHALCIDOIDEA) GENERA *CAENACIS* FÖRSTER, *CECIDOSTIBA* THOMSON AND *HOBBYA DELUCCHI*, WITH DESCRIPTIONS OF TWO NEW SPECIES**. Entomophaga Tome VI, No. 1 Trimestre (1961)

R.R.Askew; **A STUDY OF THE BIOLOGY OF SPECIES OF THE GENUS *MESOPOLOBUS WESTWOOD* (HYMENOPTERA: PTEROMALIDAE) ASSOCIATED WITH CYNIPID GALLS ON OAK**. Transactions of the Royal Entomological Society of London. 113 Pt 8, 155-173, (September 1961)

R.R.Askew; ***EUPELMUS UROZONUS DALMAN* (HYMENOPTERA, CHALCIDOIDEA) AS A PARASITE IN CYNIPID OAK GALLS**. The Entomologist, 196-201. (August 1961)

R. R. Askew; **THE BIOLOGY OF THE BRITISH SPECIES OF THE GENUS *OLYNX* FÖRSTER (HYMENOPTERA: EULOPHIDAE) WITH A NOTE ON SEASONAL COLOUR FORMS IN THE CHALCIDOIDEA**. Proceedings of the Royal Entomological Society of London (A) 36. Pts 7-9. 103-112. (September 1960)

R.R.Askew; **ON THE PALAEARCTIC SPECIES OF *SYNTOMASPIS FÖRSTER* (HYMENOPTERA, CHALCIDOIDEA, TORYMIDAE)** Entomologists Monthly Magazine (96) 184-191. (1960)

R.R.Askew & C. Thuroczy; **KEY TO CHALCIDOID PARASITOID IN CYNIPID GALL ON OAK (EUROPEAN SPECIES)**. In preparation (March 2002)

R.B. Benson; ***SYNERGUS EVANESCENS* MAYR IN STUNTED ACORNS (HYMENOPTERA: CYNIPIDAE)**. The Entomologist 79: 46/47 (1945)

Zdenek Bouček; **ON SOME BRITISH *MEGASTIGMUS* (HYMENOPTERA, TORYMIDAE), WITH A REVISED KEY TO THE WEST EUROPEAN SPECIES**. Entomologist's Gazette, Vol. 21, 265-275.



M.F. Claridge; **A CONTRIBUTION TO THE BIOLOGY AND TAXONOMY OF THE BRITISH SPECIES OF THE GENUS *EUDECATOMA* ASHMEAD (HYMENOPTERA, EURYTOMIDAE).** Transactions of the Society for British Entomology, Vol. 13, Part 9, 149-165. (1<sup>st</sup> January 1959).

R.D. Eady: **A REVISION OF SECTION 1 (MAYR 1872) OF THE GENUS *SYNERGUS* (HYMENOPTERA, CYNIPIDAE) IN BRITAIN, WITH A SPECIES NEW TO SCIENCE.** Transactions of the Society for British Entomology, Vol. 2, Part 6. , 141-152. (4<sup>th</sup> November 1952).

Hewett A. Ellis: **SOME INHABITANTS OF THE SEXUAL GALLS OF *TRIGONASPIS MEGAPTERA* (PANZER) (HYMENOPTERA: CYNIPIDAE) IN SOUTH NORTHUMBERLAND (VC67).** Cecidology Vol 17, No 1, 13-16 (Spring 2002)

Hewett A. Ellis: **INHABITANTS OF KNOPPER GALLS IN HAZLERIGG, NORTHUMBERLAND: PARASITOIDS (HYMENOPTERA: CHALCIDOIDEA) OF BOTH THE GALL-INDUCER *ANDRICUS QUERCUSCALICIS* AND THE INQUILINE *SYNERGUS GALLAEPOMIFORMIS* (HYMENOPTERA: CYNIPIDAE).** Cecidology Vol. 21. No 1, 9-21. (Spring 2006).

Philip F. Entwistle: ***POLYSTEPHA MALPIGHII* (KIEFFER) - A NEGLECTED OAK GALL.** Cecidology 16 (1), 6-12 - 2001.

Philip F. Entwistle: **THE AGAMIC GALL OF *CYNIPS LONGIVENTRIS* HARTIG, IN NORTHERN SCOTLAND.** Cecidology 14(1), 14-17 - 1999.

Philip F. Entwistle: **AN UNDESCRIBED FORM, *BORIALIS*, OF THE AGAMIC PHASE OF THE SMOOTH SPANGLE GALL, *NEUROTERUS ALBIPES* (SCHENCK) (HYMENOPTERA: CYNIPIDAE) IN THE HIGHLAND REGION OF SCOTLAND, WITH AN ANALYSIS OF ITS DISTRIBUTION IN OAK LEAVES.** Cecidology 12 (2), 44-61 - 1997.

Philip F. Entwistle: **TURKEY & OAK MARBLE GALLS.** Highland Biological Recording Group, Newsletter No. 9 - May 1996.

Philip F. Entwistle: **PROLONGATION OF THE AGAMIC STAGE OF *ANDRICUS KOLLARI* (HARTIG) (HYMENOPTERA: CYNIPIDAE) IN THE NORTH OF SCOTLAND.** Cecidology 10 (1) 46-51 - 1995.

Ch. Ferrière; **NOTES SUR LES EURYTOMA (HYMENOPTERA, CHALCIDOIDEA).** Bulletin de la Société Entomologique Suisse Band XX111 Heft 4 (9 December 1950). (*concentrates on females only*)

L. Fulmek; **PARASITINSEKTEN DER INSEKTENGALLEN EUROPAS.** Betreigen zur Entomologie, Vol. 7, 794-813 and Vol. 8, 818-855. (1978). (*some of the insects mentioned have not been reliably reported elsewhere. It is suspected that obscure rumours have been reported as fact.*)

Francis Gilbert, Charlotte Astbury, Jenny Bedingfield, Bruce Ennis, Samantha Lawson and Tracey Stitch; **THE ECOLOGY OF THE PEA GALLS OF *CYNIPS DIVISA*.** 1994

J. Gilmour & C.T. David; **GALLS OF THE BAILIWICK OF GUERNSEY,** 799-817 (1994)

M.W.R. de V Graham; **KEY TO THE BRITISH GENERA AND SPECIES OF ELACERTINAE, EULOPHINAE, ENTADONTINAE AND EUDERINAE (HYMENOPTERA, CHALCIDOIDEA).** Transactions of the Society of British Entomology; Vol. 13, Part 10, 199-204. (1<sup>st</sup> January 1959)

R.S. Hails, R.R. Askew & D.G. Notton; **THE PARASITOIDS AND INQUILINES OF THE AGAMIC GENERATION OF *ANDRICUS QUERCUSCALICIS* (HYMENOPTERA, CYNIPIDAE) IN BRITAIN.** The Entomologist - 109 (3), 165-172 (1990)



M.T. Jennings; **A NEW HOST RECORD FOR *TORYMUS CHLOROMERUS* (WALKER 1833) (HYMENOPTERA, TORYMIDAE).** The Entomologist's Monthly Magazine - Volume 139 Nos 1644-47. (April/May/June 2003)

M.T. Jennings; **SOME HYMENOPTERA ASSOCIATED WITH *ANDRICUS ARIES* (GIRAUD 1859) (HYMENOPTERA, CYNIPIDAE)** The Entomologist's Monthly Magazine - Volume 137 Nos 1644-47. (May/June/July/August 2001)

M.T. Jennings; **SOME RECORDS OF CYNIPIDAE (HYM) AND ASSOCIATED PARASITOIDS (HYM: CHALCIDOIDEA) FROM LOCHBUIE, ISLE OF MULL, SCOTLAND.** The Entomologist's Monthly Magazine - Volume 146 Nos 1751-53. (April/May/June 2010)

Vladimir Kalina; **DESCRIPTIONS OF NEW PALEARCTIC SPECIES OF THE GENUS *EUELMUS DALMAN* WITH A KEY TO SPECIES (HYMENOPTERA, CHALCIDOIDEA, EUELMIDAE)** Silvaeicultura Tropica et Subtropica, University of Agriculture, Prague, Czechoslovakia. (12, 1988)

C.K. Leach & P. Shirley; **THE RAM'S HORN GALL OF *ANDRICUS ARIES* ON *QUERCUS ROBUR* - A CYNIPID GALL TO BE ADDED TO THE BRITISH LIST?** Cecidology 14, 18-21. (1999).

D.G. Notton; **PARASITOIDS OF THE SEXUAL AND PATHENOGENETIC GENERATIONS OF *ANDRICUS QUERCUSCALICIS* (BURGSDORF 1783); HYM.; CYNIPIDAE.** Cecidology 3 (1) (1988)

John S. Noyes; **COLLECTING AND PRESERVING CHALCID WASPS (HYMENOPTERA: CHALCIDOIDEA).** Journal of Natural History, 16. 315-334 (1982)

J. Pujade-Villar, G. Melika, P. Ros-Farré, Z. Ács & G. Csoka; **CYNIPID INQUILINE WASPS OF HUNGARY, WITH TAXANOMIC NOTES ON THE WESTERN PALAEARCTIC FAUNA (HYMENOPTERA: CYNIPIDAE, CYNIPINAE, SYNERGINI).** Folia Entomologica Hungarica Roartani Közlemények, Volume 64, 121-170 (2003)

Karsten Schönrogge; **QUANTIFYING GALLS: STUDYING THE INVASION OF SPECIES-RICH COMMUNITIES.** Cecidology Spring (2001)

K. Schönrogge, G.N. Stone & M. J. Crawley; **ALIEN HERBIVORES AND NATIVE PARASITOIDS: RAPID DEVELOPMENTS AND STRUCTURE OF THE PARASITOID AND INQUILINE COMPLEX IN AN INVADING GALL WASP *ANDRICUS QUERCUSCALICIS* (HYMENOPTERA: CYNIPIDAE).** Ecological Entomology 21. 71-80 (1996)

K. Schönrogge, P. Walker & M. J. Crawley; **INVADERS ON THE MOVE: PARASITISM IN THE SEXUAL GALLS OF 4 ALIEN GALL WASPS IN BRITAIN (HYMENOPTERA: CYNIPIDAE).** Proceedings of the Royal Society. London B 265 1643-1650. (1998)

K. Schönrogge, P. Walker & M. J. Crawley; **PARASITOID & INQUILINE ATTACK IN THE GALLS OF FOUR ALIEN CYNIPID GALL WASPS: HOST SWITCHES AND THE EFFECT ON PARASITOID SEX RATIOS.** Ecological Entomology 25, 208-219 (2000)

Dr Graham Stone; **IT'S NOT *ANDRICUS CORRUPTRIX* AFTER ALL.** Cecidology, Spring (2001)

G.N. Stone; **THE HEDGEHOG GALL *ANDRICUS LUCIDUS* (Hartig 1843) CONFIRMED IN BRITAIN.** Cecidology, Z, 30-35. (1992)

Pat Walker; **TWO NEW RECORDS FOR CYNIPID OAK GALLS (CYNIPIDAE: HYMENOPTERA) IN BRITAIN.** Cecidology, Vol 17, No 1, (Spring 2002)



Pat Walker; **THE DEVELOPING COMMUNITY ON THE INTRODUCED OAK, QUERCUS CERRIS: A CATKIN GALL-FORMING WASP ANDRICUS GROSSULARIAE GIRAUD (HYMENOPTERA, CYNIPIDAE) NEW TO BRITAIN.** Entomologist's Monthly Magazine, Vol. 137, Nos. 1644-47, 145-147, (2001)

A.A. Wiebes-Rijks; **THE IDENTITY OF THE GALL-WASP CAUSING STUNTED ACORNS (HYMENOPTERA, CYNIPOIDEA).** Netherlands Journal of Zoology; 30 (2) 243-253 (1980)

A.A. Wiebes-Rijks; **THE SEXUAL GENERATION OF THE ANDRICUS KOLLARI GROUP IN THE NETHERLANDS (HYMENOPTERA, CYNIPIDAE).** Entomologische Berichten, Deel 38. 1.1X.1978.

## **Publications - books**

T.N. Ananthkrishnan, editor; **THE BIOLOGY OF GALL INSECTS.** Edward Arnold, (1984) - one of the most comprehensive examinations of gall insects, bring together many of the world's leading experts. There is more information buried in these chapters than is found in many more pages elsewhere.

R.R. Askew; **PARASITIC INSECTS.** Heinemann Educational Books. (1971) - an excellent and clearly-written guide to the subject of parasitism by one of the great experts and specialists in the area.

R.R. Askew; **HANDBOOKS FOR THE IDENTIFICATION OF BRITISH INSECTS, (HYMENOPTERA: CHALCIDOIDEA) ELASMIDAE & EULOPHIDAE (ELACHERTINAE, EULOPHINAE, EUDERINAE).** Royal Entomological Society of London. Vol. V111 Part 2 (b) (31<sup>st</sup> January 1968). - one of only two volumes devoted to Chalcidoidea, in this series.

Zdenek Bouček & Jean Yves Rasplus; **ILLUSTRATED KEY TO WEST-PALEARCTIC GENERA OF PTEROMALIDAE.** INRA (Institut National de la Recherche Agronomique) (1991) - updating Graham's PTEROMALIDAE of 1969 - a marvellous addition to knowledge of this family

Edward Connold; **BRITISH OAK GALLS.** Adlard & Son (1908) - still the finest book on oak galls, with remarkable photographs which remain some of the best sources for identification

Arnold Darlington; **THE POCKET ENCYCLOPAEDIA OF PLANT GALLS IN COLOUR.** Blandford Press(1968) - one of the seminal books on galls which is still worth having. Full of practical information and illustrations.

R. D. Eady & J. Quinlan; **HANDBOOKS FOR THE IDENTIFICATION OF BRITISH INSECTS, HYMENOPTERA: CYNIPOIDEA.** Royal Entomological Society of London. Vol V111. Part 1 (a) (1963) - with special thanks for permission from the Royal Entomological Society to use the keys from this work. - the essential base on which keys for this group have been based. Quality pioneering work on Cynipids though some of the keys and drawings take some concentration if they are to be followed.

Gary A.P. Gibson, John T. Huber, James B. Woolley; **ANNOTATED KEYS TO THE GENERA OF NEARCTIC CHALCIDOIDEA (HYMENOPTERA).** NRC Research Press, (1996) - a wonderful introduction to chalcids, with pages of electron micrographs to illustrate structural points, together with detailed keys. Though this refers to a different part of the world, there is much to be learned in this splendid volume.

M.W.R. de V. Graham; **THE PTEROMALIDAE OF NORTH-WESTERN EUROPE (HYMENOPTERA: CHALCIDOIDEA).** Bulletin of the British Museum (Natural History) Supplement 16 (1969). - accurate, though difficult to follow at times, but an essential addition to the bookshelf.



M.W.R. de V. Graham; **A RECLASSIFICATION OF THE EUROPEAN TETRASTICHINAE (HYMENOPTERA: EULOPHIDAE), WITH A REVISION OF CERTAIN GENERA.** Bulletin of the British Museum (Natural History) Entomology series Vol. 55 (1) (1969). – intricate and difficult to follow in parts, but also an essential addition.

M.W.R. de V. Graham; **A RECLASSIFICATION OF THE EUROPEAN TETRASTICHINAE (HYMENOPTERA: EULOPHIDAE), REVISION OF THE REMAINING GENERA.** MemoIRS OF THE American Entomological Institute No. 49 (1991). – an essential to understanding these difficult genera.

M.W.R. de V. Graham & M. J. Gijswijt; **REVISION OF THE EUROPEAN SPECIES OF TORYMUS DALMAN (s. lat) (HYMENOPTERA: TORYMIDAE).** Leiden, Nationaal Natuurhistorisch Museum (March 1998). – a seminal work and essential if you are to understand the changes in this genus. Well laid-out and explained.

Csóka György; **GUBAKSOK (PLANT GALLS).** Forest Research Institute (Budapest) in English & Hungarian (1997) – a marvellous addition to the books on the subject, with first-class photographs, serving as an introduction to possible new species when they arrive in this country.

M.G. Fitton, M.W.R. de V. Graham, Z.R. Bouček, N..D.M. Fergusson, T. Huddleston, J. Quinlan & O.W. Richards; **KLOET AND HICKS: A CHECK LIST OF BRITISH INSECTS.** Volume XI, Part 4: Hymenoptera. Royal Entomological Society of London. (1945 → 1978) – the basic guide to taxonomy in Hymenoptera. It must be read in conjunction with the various revisions which have been published over the years, until a new version of this work is completed. It is a start point for checking taxonomy backwards or forwards and has been used as a base for many of the hymenopteran species lists in the MapMate recording program.

Ian Gauld & Barry Bolton; **THE HYMENOPTERA.** British Museum (Natural History) & Oxford University Press (1988). – the foundation for understanding modern thinking on Hymenoptera

Henri Goulet & John T. Huber, editors; **HYMENOPTERA OF THE WORLD: AN IDENTIFICATION GUIDE TO FAMILIES.** Research Branch, Agriculture Canada (1993). – an outstanding, practical key to families, with superb explanatory drawings which bring a new clarity to the subject. Every term and couplet is covered by drawings at the point of use.

John Heath, editor; **THE MOTHS AND BUTTERFLIES OF GREAT BRITAIN AND IRELAND.** Harley Books, (1983 onwards) – the books for information on Lepidoptera.

Oswald Peck, Zdeněk Bouček and Augustin Hoffer; **KEYS TO THE CHALCIDOIDEA OF CZECHOSLOVAKIA (INSECTA: HYMENOPTERA).** Memoirs of the Entomological Society of Canada, No. 34 (1964) – covers many species which are common to the UK as well as Czechoslovakia and provides well-illustrated keys to genera and some species.

Donald L. J. Quicken; **PARASITIC WASPS.** Chapman & Hall (1997) – extremely comprehensive and provides a great deal of information but very much aimed at professional entomologists.

Margaret Redfern & R.R. Askew; **PLANT GALLS.** Naturalist's Handbooks, Richmond Publishing Co. Ltd (1992) – one of the great works on galls and responsible for many people becoming interested in these amazing structures and their inhabitants. Simply written and easy to understand; the ideal introduction, with excellent keys to many galls.

Margaret Redfern, Peter Shirley and Michael Bloxham; **KEYS TO GALLS; IDENTIFICATION OF GALLS ON PLANTS AND FUNGI IN BRITAIN.** AIDGAP key, Field Study Council (October 2002) – a really comprehensive and well thought-out book, by members of the British Plant Gall Society, covering as many



galls as are presently known in Britain; a tremendous effort which has been prepared to the usual high standards of the Field Studies Council.

O.W. Richards; **HANDBOOKS FOR THE IDENTIFICATION OF BRITISH INSECTS, HYMENOPTERA: INTRODUCTION AND KEYS TO FAMILIES**. Royal Entomological Society of London. Vol. VI. Part 1 (1956) - contains drawings and a detailed glossary for the terms used in RES Handbooks.

Michael J. Roberts; **SPIDERS OF BRITAIN & NORTHERN EUROPE**. Collins Field Guide (1995).

Mark R. Shaw; **REARING PARASITIC HYMENOPTERA**. The Amateur Entomologists' Society, Volume 25. (1997) - Excellent concentrated advice on this difficult subject by a real expert.

G. Stone et al.; **OAK GALL WASPS OF THE WESTERN PALAEARCTIC**. Ray Society, in preparation (2006) - destined to contain the complete keys, biology and cover all aspects of these gall-inhabitants.

Robin Williams; **BRITISH HYMENOPTERA, GLOSSARY FOR USE WITH IDENTIFICATION KEYS**. Vanellus Publications (2006 continually up-dated)

Robin Williams; **THE OAK MARBLE-GALL IN BRITAIN, WITH KEYS, DESCRIPTIONS AND DRAWINGS OF ITS INHABITANTS**. Vanellus Publications (1998)

## **Publications - CD rom/Online**

John S. Noyes; **INTERACTIVE CATALOGUE OF WORLD CHALCIDOIDEA 2001; SCIENTIFIC NAMES FOR INFORMATION MANAGEMENT**. Taxapad, The Natural History Museum (2001) - a fantastic resource containing the up-to-date names of all chalcids in the world, with synonyms, biology and pictures, where available. Can now also be found on the internet.

The Natural History Museum; **UNIVERSAL CHALCIDOIDEA DATABASE, A KEY TO THE FAMILIES OF CHALCIDOIDEA**. [http://www.nhm.ac.uk/entomology/chalcidoids/keys1\\_14.html](http://www.nhm.ac.uk/entomology/chalcidoids/keys1_14.html);- as updated.



## E. Names from Connold's 'British Oak Galls'

Connold, BRITISH OAK GALLS, published in 1908, is still one of the great works on these galls and used by many workers in trying to come to terms with how they are formed and survive. To understand this seminal work fully it is important to have the old and modern names of causers at your fingertips. Previously, gall-wasps were given separate generic names for agamic and sexual generations. Now they are seen to be the same species, but here the specific name of the previous system, in use at the time of Connold, is placed in brackets after the appropriate sex. More recent synonyms are in a separate column below today's name.

Present day /Synonyms	Connold AGAMIC	Connold SEXUAL
--------------------------	-------------------	-------------------

### Causers

#### *Andricus*

<i>A. albopunctatus</i> (Schlechtendal)	(1) ( <i>Amphilothrix albopunctata</i> )*	
<i>A. amenti</i> , Giraud 1859		(2)
<i>A. aries</i>	(3)	
<i>A. callidoma</i> (Hartig)	(4) ( <i>Amphilothrix callidoma</i> )	(5) ( <i>Andricus cirratus</i> )
<i>A. corruptrix</i> (Schlechtendal)	(6)	(7)
<i>A. curator</i> , Hartig	(8) ( <i>Amphilothrix collaris</i> )	(9)
<i>A. fecundator</i> (Hartig)	(10) ( <i>Amphilothrix fecundatrix</i> )	(11) ( <i>Andricus pillosus</i> )
<i>A. fecundator</i> (Hartig)		
<i>A. glandulae</i> (Hartig)	(12)	(13)
<i>A. xanthopsis</i> Schlechtendal		
<i>Andricus grossulariae</i> (Giraud )	(14)	(15)
<i>A. inflator</i> , Hartig	(16) ( <i>Amphilothrix globuli</i> )	(17)
<i>A. kollari</i> (Hartig)	(18) ( <i>Cynips kollari</i> )	(19) ( <i>Andricus circulans</i> )
<i>A. legitimus</i> , Wiebes-Rijks	-	(20) ( <i>Andricus glandium</i> )
<i>A. lignicola</i> (Hartig)	(21)	(22)
<i>A. vanheurni</i> (Drs van Leeuwen & Deckhuizen)		
<i>A. lucidus</i> (Hartig)	(23)	(24)
<i>A. nudus</i> , Adler	(25) ( <i>Amphilothrix malpighi</i> )	(26)
<i>A. quadrilineatus</i> , Hartig 1840	(27) ( <i>Amphilothrix marginalis</i> ) + ( <i>Amphilothrix quadrilineatus</i> ) -	
<i>A. quercuscalicis</i> (Burgsdorf)	(28) ( <i>Cynips calicis</i> )	(29)
<i>A. quercuscorticis</i> (Linnaeus)	(30) ( <i>Amphilothrix corticis</i> )	(31) ( <i>Andricus gemmatus</i> )
<i>A. quercusradicis</i> (Fabricius)	(32) ( <i>Amphilothrix radialis</i> )	(33) ( <i>Andricus noduli</i> )
<i>A. trilineatus</i> Hartig		





Present day /Synonyms	Connold AGAMIC	Connold SEXUAL
<i>A. quercusramuli</i> (Linnaeus)	(34) ( <i>Amphilothrix autumnalis</i> )	(35) ( <i>Andricus ramuli</i> )
<i>A. rhizomae</i> (Hartig)	(36)	-
<i>A. seminationis</i> (Giraud)	(37) ( <i>Amphilothrix seminationis</i> )	-
<i>A. solitarius</i> (Fonscolombe)	(38) -	(39) -
<i>A. occultus</i> Tschek		
<i>A. testaceipes</i> , Hartig	(40) ( <i>Amphilothrix sieboldi</i> )	(41)
<b>Aphelonyx</b>		
<i>A. cerricola</i> Giraud	(42) -	-
<b>Biorhiza</b>		
<i>B. pallida</i> (Olivier)	(43) ( <i>Biorhiza aptera</i> )	(44) ( <i>Teras terminalis</i> )
<b>Callirhytis</b>		
<i>C. bella</i> (Dettmer)	-	(45)
<i>C. erythrocephala</i> (Giraud)	(46) -	-
<i>C. erythrostoma</i> , Dettmer	-	(47) -
<b>Cynips</b>		
<i>C. agama</i> , Hartig	(48) ( <i>Dryophanta agama</i> )	-
<i>C. disticha</i> , Hartig	(49) ( <i>Dryophanta disticha</i> )	(50) -
<i>C. indistincta</i> Niblett		
<i>C. divisa</i> , Hartig	(51) ( <i>Dryophanta divisa</i> )	(52) ( <i>Spathogaster verrucosus</i> )
<i>C. longiventris</i> , Hartig	(53) ( <i>Dryophanta longiventris</i> )	(54)
<i>C. substituta</i> Kinsey		
<i>C. quercusfolii</i> , Linnaeus	(55) ( <i>Dryophanta scutellaris</i> )	(56) ( <i>Spathogaster taschenbergi</i> )
<b>Neuroterus</b>		
<i>N. albipes</i> (Schenck 1863)	(57) ( <i>Neuroterus laeviusculus</i> )	(58) ( <i>Spathogaster albipes</i> )
<i>N. anthracinus</i> (Curtis)	(59) ( <i>Neuroterus ostreus</i> )**	(60) -
<i>Andricus anthracina</i> (Curtis)		
<i>Andricus furunculus</i> (Bayerinck 1882)		
<i>N. aprilinus</i> (Giraud)	(61) -	(62) ( <i>Spathogaster aprilinus</i> )
<i>N. schlehtendali</i> Mayr		
<i>N. numismalis</i> (Geoffroy in Fourcroy)	(63) ( <i>Neuroterus numismatis</i> )	(64) ( <i>Spathogaster vesicatrix</i> )
<i>N. vesicator</i>		
<i>N. politus</i>		
<i>N. quercusbaccarum</i> (Linnaeus)	(65) ( <i>Neuroterus lenticularis</i> )	(66) ( <i>Spathogaster baccarum</i> )
<i>N. tricolor</i> (Hartig)	(67) ( <i>Neuroterus fumipennis</i> )	(68) ( <i>Spathogaster tricolor</i> )
<b>Trigonaspis</b>		
<i>T. megaptera</i> (Panzer)	(69) ( <i>Biorhiza renum</i> )	(70) ( <i>Trigonaspis crustalis</i> )



## F. Insects measured (reared, or in museums)

line in bold – sufficient specimens measured for reliable ratios (5 or more)

normal case – insufficient specimens, under that criterion

SEX: ♂ - agamic, ♀ - female, ♂ - male

NUMBER – number of insects measured

\* - no specimens measured – though some may have been seen in museums or examined

SPECIES	SEX	NUMBER
<b>CAUSERS</b>		
<i>Andricus</i>		
<i>A. albopunctatus</i>	♂	2
<i>A. amenti</i>	♀	1
<i>A. amenti</i>	♂	1
<i>A. aries</i>	♂	20
<i>A. callidoma</i>	♀	6
<i>A. callidoma</i>	♂	6
<i>A. callidoma</i>	♂	*
<i>A. corruptrix</i>	♀	18
<i>A. corruptrix</i>	♂	16
<i>A. corruptrix</i>	♂	15
<i>A. curator</i>	♀	12
<i>A. curator</i>	♂	14
<i>A. Curvator</i>	♂	1
<i>A. fecundator</i>	♀	6
<i>A. fecundator</i>	♂	4
<i>A. fecundator</i>	♂	9
<i>A. glandulae</i>	♀	3
<i>A. glandulae</i>	♂	10
<i>A. glandulae</i>	♂	4
<i>A. grossulariae</i>	♀	9
<i>A. grossulariae</i>	♂	16
<i>A. grossulariae</i>	♂	68
<i>A. inflator</i>	♀	5
<i>A. inflator</i>	♂	1
<i>A. inflator</i>	♂	4
<i>A. kollari</i>	♀	12
<i>A. kollari</i>	♂	5
<i>A. kollari</i>	♂	48
<i>A. legitimus</i>	♂	*
<i>A. lignicola</i>	♀	32
<i>A. lignicola</i>	♂	18
<i>A. lignicola</i>	♂	58
<i>A. lucidus</i>	♀	7
<i>A. lucidus</i>	♂	71
<i>A. lucidus</i>	♂	94
<i>A. nudus</i>	♀	2
<i>A. nudus</i>	♂	*
<i>A. nudus</i>	♂	6
<i>A. quadrilineatus</i>	♂	2
<i>A. quercuscalicis</i>	♀	28
<i>A. quercuscalicis</i>	♂	34
<i>A. quercuscalicis</i>	♂	50

SPECIES	SEX	NUMBER
<b>CAUSERS</b>		
<i>Andricus</i>		
<i>A. quercuscorticis</i>	♀	*
<i>A. quercuscorticis</i>	♂	*
<i>A. quercuscorticis</i>	♂	5
<i>A. quercusradicis</i>	♀	2
<i>A. quercusradicis</i>	♂	3
<i>A. quercusradicis</i>	♂	9
<i>A. quercusramuli</i>	♀	24
<i>A. quercusramuli</i>	♂	69
<i>A. quercusramuli</i>	♂	*
<i>A. rhizomae</i>	♂	1
<i>A. seminationis</i>	♂	6
<i>A. solitarius</i>	♀	4
<i>A. solitarius</i>	♂	2
<i>A. solitarius</i>	♂	1
<i>A. testaceipes</i>	♀	3
<i>A. testaceipes</i>	♂	*
<i>A. testaceipes</i>	♂	7
<i>Aphelonyx</i>		
<i>A. cerricola</i>	♂	48
<i>Biorhiza</i>		
<i>B. pallida</i>	♀	64
<i>B. pallida</i>	♂	25
<i>B. pallida</i>	♂	3
<i>Callirhytis</i>		
<i>C. bella</i>	♀	5
<i>C. bella</i>	♂	2
<i>C. erythrocephala</i>	♀	4
<i>C. erythrocephala</i>	♂	1
<i>C. erythrocephala</i>	♂	9
<i>Cynips</i>		
<i>C. agama</i>	♂	2
<i>C. disticha</i>	♀	1
<i>C. disticha</i>	♂	1
<i>C. disticha</i>	♂	5
<i>C. divisa</i>	♀	2
<i>C. divisa</i>	♂	1
<i>C. divisa</i>	♂	29
<i>C. longiventris</i>	♀	1
<i>C. longiventris</i>	♂	2
<i>C. longiventris</i>	♂	8
<i>C. quercusfolii</i>	♀	4
<i>C. quercusfolii</i>	♂	5



## oak-galls

SPECIES	SEX	NUMBER
<b>CAUSERS</b>		
<i>Cynips</i>		
<i>C. quercusfolii</i>	♂	14
<i>Neuroterus</i>		
<i>N. albipes</i>	♀	5
<i>N. albipes</i>	♂	4
<i>N. albipes</i>	♂	11
<i>N. anthracinus</i>	♀	5
<i>N. anthracinus</i>	♂	1
<i>N. anthracinus</i>	♂	2
<i>N. aprilinus</i>	♀	2
<i>N. aprilinus</i>	♂	1
<i>N. aprilinus</i>	♂	1
<i>N. numismalis</i>	♀	4
<i>N. numismalis</i>	♂	3
<i>N. numismalis</i>	♂	5
<i>N. quercusbaccarum</i>	♀	12
<i>N. quercusbaccarum</i>	♂	21
<i>N. quercusbaccarum</i>	♂	95
<i>N. saliens</i>	♀	1
<i>N. saliens</i>	♂	2
<i>N. saliens</i>	♂	*
<i>N. tricolor</i>	♀	6
<i>N. tricolor</i>	♂	4
<i>N. tricolor</i>	♂	1
<i>Trigonaspis</i>		
<i>T. megaptera</i>	♀	4
<i>T. megaptera</i>	♂	3
<i>T. megaptera</i>	♂	1
<b>INQUILINES</b>		
<i>Ceroptres</i>		
<i>C. arator</i>	♀	14
<i>C. arator</i>	♂	6
<i>Saphonecrus</i>		
<i>S. connatus</i>	♀	8
<i>S. connatus</i>	♂	9
<i>Synergus</i>		
<i>S. albipes</i>	♀	21
<i>S. albipes</i>	♂	32
<i>S. apicalis</i>	♀	3
<i>S. apicalis</i>	♂	18
<i>S. clandestinus</i>	♀	8
<i>S. clandestinus</i>	♂	7
<i>S. crassicornis</i>	♀	6
<i>S. crassicornis</i>	♂	6
<i>S. gallaepomiformis</i>	♀	107
<i>S. gallaepomiformis</i>	♂	149
<i>S. incrassatus</i>	♀	10
<i>S. incrassatus</i>	♂	8
<i>S. nervosus</i>	♀	11

## insects measured

SPECIES	SEX	NUMBER
<b>INQUILINES</b>		
<i>Synergus</i>		
<i>S. nervosus</i>	♂	11
<i>S. pallicornis</i>	♀	6
<i>S. pallidipennis</i>	♀	18
<i>S. pallidipennis</i>	♂	2
<i>S. reinhardi</i>	♀	106
<i>S. reinhardi</i>	♂	110
<i>S. rotundiventris</i>	♀	5
<i>S. rotundiventris</i>	♂	4
<i>S. ruficornis</i>	♀	5
<i>S. ruficornis</i>	♂	5
<i>S. thaumacerus</i>	♀	5
<i>S. thaumacerus</i>	♂	1
<i>S. umbraculus</i>	♀	49
<i>S. umbraculus</i>	♂	55
<i>S. variabilis</i>	♀	22
<i>S. variabilis</i>	♂	23
<b>PARASITOIDS</b>		
<i>Eurytoma</i>		
<i>E. brunniventris</i>	♀	27
<i>E. brunniventris</i>	♂	18
<i>Sycophila</i>		
<i>S. biguttata</i>	♀	22
<i>S. biguttata</i>	♂	3
<i>S. flavicollis</i>	♀	6
<i>S. flavicollis</i>	♂	6
<i>Sycophila</i>		
<i>S. variegata</i>	♀	5
<i>S. variegata</i>	♂	13
<i>Megastigmus</i>		
<i>M. dorsalis</i>	♀	33
<i>M. dorsalis</i>	♂	17
<i>M. stigmatizans</i>	♀	3
<i>M. stigmatizans</i>	♂	5
<i>Torymus</i>		
<i>T. affinis</i>	♀	85
<i>T. affinis</i>	♂	113
<i>T. auratus (nitens)</i>	♀	93
<i>T. auratus (nitens)</i>	♂	73
<i>T. chloromerus</i>	♀	3
<i>T. chloromerus</i>	♂	3
<i>T. cyaneus</i>	♀	8
<i>T. cyaneus</i>	♂	3
<i>T. erucarum</i>	♀	7
<i>T. erucarum</i>	♂	6
<i>T. fastuosus</i>	♀	4
<i>T. fastuosus</i>	♂	8
<i>T. flavipes</i>	♀	62
<i>T. flavipes</i>	♂	35



## oak-falls

SPECIES	SEX	NUMBER
PARASITOIDS		
<i>Torymus</i>		
<i>T. formosus</i>	♀	5
<i>T. formosus</i>	♂	1
<i>T. geranii</i>	♀	18
<i>T. geranii</i>	♂	22
<i>T. nobilis</i>	♀	19
<i>T. nobilis</i>	♂	19
<i>T. notatus</i>	♀	6
<i>T. notatus</i>	♂	6
<i>T. roboris</i>	♀	7
<i>T. roboris</i>	♂	2
<i>T. scutellaris</i>	♀	4
<i>T. scutellaris</i>	♂	2
<i>Ormyrus</i>		
<i>O. nitidulus</i>	♀	6
<i>O. nitidulus</i>	♂	7
<i>O. pomaceus</i>	♀	5
<i>O. pomaceus</i> ♂		4
<i>Arthrolytus</i>		
<i>A. ocellus</i>	♀	5
<i>A. ocellus</i>	♂	5
<i>Caenacis</i>		
<i>C. lauta</i>	♀	2
<i>C. lauta</i>	♂	3
<i>Cecidostiba</i>		
<i>C. fungosa</i>	♀	49
<i>C. fungosa</i>	♂	46
<i>C. geganius</i>	♀	2
<i>C. geganius</i>	♂	3
<i>C. semifascia</i>	♀	24
<i>C. semifascia</i>	♂	16
<i>Hobbya</i>		
<i>H. stenonota</i>	♀	47
<i>H. stenonota</i>	♂	24
<i>Mesopolobus</i>		
<i>M. albitarsus</i>	♀	4
<i>M. albitarsus</i>	♂	4
<i>M. amaenus</i>	♀	10
<i>M. amaenus</i>	♂	4
<i>M. dubius</i>	♀	7
<i>M. dubius</i>	♂	5
<i>M. fasciventris</i>	♀	9
<i>M. fasciventris</i>	♂	11
<i>M. fuscipes</i>	♀	9
<i>M. fuscipes</i>	♂	11
<i>M. sericeus</i>	♀	52
<i>M. sericeus</i>	♂	49

## insects measured

SPECIES	SEX	NUMBER
PARASITOIDS		
<i>Mesopolobus</i>		
<i>M. tibialis</i>	♀	13
<i>M. tibialis</i>	♂	28
<i>M. xanthocerus</i>	♀	9
<i>M. xanthocerus</i>	♂	8
<i>Ormocerus</i>		
<i>O. latus</i>	♀	3
<i>Ormocerus</i>		
<i>O. latus</i>	♂	3
<i>O. vernalis</i>	♀	7
<i>O. vernalis</i>	♂	3
<i>Eupelmus</i>		
<i>E. annulatus</i>	♀	1
<i>E. annulatus</i>	♂	*
<i>E. urozonus</i>	♀	34
<i>E. urozonus</i>	♂	22
<i>E. vesicularis</i>	♀	1
<i>E. vesicularis</i>	♂	3
<i>Aprostocetus</i>		
<i>A. aethiops</i>	♀	6
<i>A. aethiops</i>	♂	1
<i>A. arsames</i>	♀	12
<i>A. arsames</i>	♂	4
<i>A. euedoreschus</i>	♀	4
<i>A. euedoreschus</i>	♂	1
<i>A. gallarum</i>	♀	13
<i>A. gallarum</i>	♂	10
<i>A. gallarum f. pulchra</i> ♀		1
<i>A. gallarum f. pulchra</i> ♂		2
<i>A. skianeuros</i>	♀	83
<i>A. skianeuros</i>	♂	84
<i>A. trilineatus</i>	♀	7
<i>A. trilineatus</i>	♂	1
<i>Baryscapus</i>		
<i>B. diaphantus</i>	♀	24
<i>B. diaphantus</i>	♂	5
<i>Pediobius</i>		
<i>P. clita</i>	♀	20
<i>P. clita</i>	♂	5
<i>P. lysis</i>	♀	7
<i>P. lysis</i>	♂	6
<i>Quadrastichus</i>		
<i>Q. anysis</i>	♀	*
<i>Q. anysis</i>	♂	5



*oak-falls*

*insects measured*

SPECIES	SEX	NUMBER
<b>PARASITOIDS</b>		
<i>Tamarixia</i>		
<i>T. pubescens</i>	♀	2
<i>T. pubescens</i>	♂	2
<i>Gelis</i>		
<i>G. areator</i>	♀	3
<i>G. areator</i>	♂	*
<i>G. formicarius</i>	♀	3
<i>G. formicarius</i>	♂	1
<i>Mastrus</i>		
<i>M. deminuens</i>	♀	*
<i>M. deminuens</i>	♂	*
<i>Scambus</i>		
<i>S. planatus</i>	♀	3
<i>S. planatus</i>	♂	1
<i>Spilomicrus</i>		
<i>S. stigmaticalis</i>	♀	4
<i>S. stigmaticalis</i>	♂	4



## G. First known records of inquilines & parasitoids reared from British oak-galls

(does not include Connold, or earlier, as these are difficult to tie in with modern nomenclature)  
notification of any earlier dates or authors would be appreciated

	AUTHORITY	REARED/RW
<b>1. Andricus albopunctatus (ag)</b>		
Synergus gallaepomiformis	RES Handbook 1963	
S. nervosus	RES Handbook 1963	
Eurytoma brunniventris	Askew 1961	
Caenacis lauta	Askew 1961	
Mesopolobus tibialis	Askew 1961	
Eupelmus urozonus	Askew 1961	
<b>2. Andricus amenti sexual</b>		
(none known)		
<b>3. Andricus aries ag. (RAMS-HORN GALL)</b>		
Ceroptres arator	Williams ® (2002)	*
Synergus gallaepomiformis	Wurzell ® (2000)	
S. pallicornis	Williams ® (2005)	
S. pallidipennis	Williams ® (2005)	*
S. reinhardi	Jennings ® (2000)	*
S. rotundiventris	Jennings ® (2000)	
Sycophila biguttata	Jennings ® (2000)	*
S. flavicollis	Jennings ® (2000)	
Megastigmus dorsalis	Jennings ® (2000)	*
Ormyrus nitidulus	Williams ® (2004)	*
<b>4. Andricus callidoma ag. (STALKED-SPINDLE GALL)</b>		
Synergus gallaepomiformis	RES Handbook 1963	*
Eurytoma brunniventris	Askew 1961	
Mesopolobus sericeus	Askew 1961	
<b>5. Andricus callidoma sexual (TUFTED GALL)</b>		
Mesopolobus fuscipes	Askew 1961	
Mesopolobus xanthocerus	Jennings ® (2008)	
Aulogymnus gallarum	Jennings ® (2008)	
<b>6. Andricus corruptrix ag.</b>		
Ceroptres arator	Walker ® (1993)	
Synergus apicalis	Williams ® (1999)	*
S. gallaepomiformis	Schönrogge et al. 2000	
S. reinhardi	Schönrogge et al. 2000	*
S. umbraculus	Walker ® (1993)	
Eurytoma brunniventris	Schönrogge et al. 2000	
Sycophila biguttata	Schönrogge et al. 2000	*
S. variegata	Williams ® (2001)	*
Megastigmus dorsalis	Williams ® (2001)	*
Torymus auratus (=nitens)	Walker ® (2002)	
T. flavipes	Schönrogge et al. 2000	
Ormyrus pomaceus	Schönrogge et al. 2000	
Cecidostiba fungosa	Schönrogge et al. 2000	
Mesopolobus amaenus	Schönrogge et al. 2000	
M. dubius	Walker ® (1993)	
M. fasciventris	Schönrogge et al. 2000	
M. fuscipes	Walker ® (1993)	
M. sericeus	Schönrogge et al. 2000	*
M. tibialis	Walker ® (1993)	
Eupelmus urozonus	Schönrogge et al. 2000	



	AUTHORITY	REARED/RW
<b>7. Andricus corruptrix sexual</b>		
Mesopolobus dubius	Schönrogge et al. 2000	
M. fuscipes	Schönrogge et al. 2000	
M. tibialis	Walker © (2001)	
M. xanthocerus	Walker © (1991-3)	
<b>8. Andricus curvator ag. (COLLARED-BUD GALL)</b>		
Synergus albipes	RES Handbook 1963	
S. nervosus	RES Handbook 1963	
Mesopolobus amaenus	Askew 1961	
<b>9. Andricus curvator sexual (CURVED-LEAF GALL)</b>		
Synergus albipes	RES Handbook 1963	
S. crassicornis	RES Handbook 1963	
S. gallaepomiformis	RES Handbook 1963	*
S. nervosus	RES Handbook 1963	
Eurytoma brunniventris	Askew 1961	
Megastigmus dorsalis	Askew 1966	*
Torymus flavipes	Askew 1961	*
T. geranii	Askew 1961	
T. notatus	Askew 1960	
Mesopolobus albitarsus	Askew 1961	
M. amaenus	Askew 1961	
M. fasciiventris	Askew 1961	
M. fuscipes	Askew 1961	
M. sericeus	Askew 1961	
M. tibialis	Askew 1961	*
Eupelmus urozonus	Askew 1961	
Aulogymnus arsames	Askew 1960	*
A. gallarum	Askew 1961	*
A. gallarum f. pulchra	Askew 1960	
<b>10. Andricus fecundator ag. (ARTICHOKE GALL)</b>		
Synergus crassicornis	RES Handbook 1963	
Megastigmus dorsalis	Parsons © (2005)	
T. auratus (=nitens)	Askew 1965	
Eupelmus urozonus	Askew 1961	
Aulogymnus trilineatus	Askew 1960	
<b>11. Andricus fecundator sexual (HAIRY-CATKIN GALL)</b>		
Mesopolobus xanthocerus	Askew 1961	
<b>12. Andricus glandulae ag.</b>		
Synergus nervosus	RES Handbook 1963	
<b>13. Andricus glandulae sexual</b>		
(none known)		
<b>14. Andricus grossulariae ag.</b>		
Synergus albipes	Williams © (2005)	*
Eurytoma brunniventris	Walker © (2004)	*
Sycophila biguttata	Williams © (2004)	*
Megastigmus dorsalis	Walker © (2004)	*
Ormyrus nitidulus	Williams © (2004)	*
Cecidostiba fungosa	Williams © (2004)	*
Mesopolobus sericeus	Williams © (2004)	*
M. tibialis	Dodd © (2005)	
Scambus planatus	Williams © (2004)	*



	AUTHORITY	REARED/RW
<b>15. Andricus grossulariae sexual</b>		
Synergus gallaepomiformis	Walker © Askew (2001)	
Eurytoma brunniventris	Walker © Askew (2001)	
Sycophila flavicollis	Walker © Askew (2001)	
Sycophila variegata	Walker © Askew (2001)	
Megastigmus dorsalis	Walker © (2000)	
Torymus flavipes	Walker © Askew (2001)	
Cecidostiba fungosa	Walker © Askew (2001)	
Mesopolobus dubius	Walker © (2001)	
M. fuscipes	Walker © (2001)	
M. xanthocerus	Walker © (2001)	*
Eupelmus urozonus	Walker © (2001)	
<b>16. Andricus inflator ag. (GLOBULAR GALL)</b>		
Synergus ruficornis	RES Handbook 1993	
Eurytoma brunniventris	Askew 1961	
Mesopolobus sericeus	Askew 1961	
<b>17. Andricus inflator sexual (TWIG-GALL)</b>		
Synergus crassicornis	RES Handbook 1963	
Megastigmus dorsalis	Askew 1961	
Torymus flavipes	Askew 1961	
Aulogymnus arsames	Askew 1960	
<b>18. Andricus kollari ag. (MARBLE-GALL)</b>		
Ceroptres arator	RES Handbook 1963	*
Saphonecrus connatus	Walker © (1993)	
Synergus albipes	Schönrogge et al. 2000	*
S. gallaepomiformis	Askew 1993	*
S. pallicornis	Walker © (1993)	*
S. pallidipennis	RES Handbook 1963	*
S. reinhardi	Askew 1993	*
S. umbraculus	Askew 1993	*
Eurytoma brunniventris	Askew 1961	*
Sycophila bigutatta	Askew 1961	*
S. variegata	Askew 1961	*
Megastigmus dorsalis	Askew 1961	*
M. stigmatizans	Askew 1961	*
T. auratus (=nitens)	Askew 1961	*
Torymus geranii	Askew 1961	*
Ormyrus nitidulus	Walker © (1993)	
Caenacis lauta	Askew 1961	
Cecidostiba fungosa	Schönrogge et al. 2000	
C. semifascia	Walker © (1993)	*
Hobbya stenonota	Askew 1961	
Mesopolobus amaenus	Askew 1961	
M. dubius	Walker © (1993)	
M. fasciiventris	Askew pc	
M. fuscipes	Walker © (1993)	
M. sericeus	Askew 1961	*
M. xanthocerus	Walker © (1993)	
Eupelmus annulatus	Entwistle © (early 50's)	
E. urozonus	Askew 1961	*
Aulogymnus trilineatus	Walker © (1994)	
<b>19. Andricus kollari sexual</b>		
Mesopolobus dubius	Walker © (2001)	
M. fuscipes	Askew 1961	*
M. tibialis	Askew 1961	*
M. xanthocerus	Askew 1961	
<b>20. Andricus legitimus ag. (STUNTED ACORN)</b>		
Synergus clandestinus	RES Handbook 1963	
S. crassicornis	Benson/Niblett 1945	





	AUTHORITY	REARED/RW
<b>21. Andricus lignicola ag. (COLA-NUT)</b>		
Ceroptres arator	Walker ® (1993)	
Saphonecrus connatus	Walker ® (1993)	
Synergus albipes	Walker ® (1993)	
S. apicalis	Walker ® (1993)	
S. crassicornis	Walker ® (1993)	
S. gallaepomiformis	Askew/Neill 1993	*
S. reinhardi	Askew/Neill 1993	*
S. umbraculus	Askew/Neill 1993	*
Eurytoma brunniventris	Walker ® (1993)	
Sycophila biguttata	Walker ® (1993)	
Megastigmus dorsalis	Askew/Neill 1993	
Torymus auratus (=nitens)	Askew/Neill 1993	*
T. geranii	Walker ® (1993)	
Ormyrus nitidulus	Walker ® ((1993)	
Mesopolobus amaenus	Askew/Neill 1993	
M. fasciiventris	Walker ® (1993)	
M. fuscipes	Walker ® (1993)	
M. sericeus	Askew/Neill 1993	*
M. xanthocerus	Walker ® (1992)	
Eupelmus urozonus	Askew/Neill 1993	
Aulogymnus skianeuros	Williams ® (2005)	*
<b>22. Andricus lignicola sexual</b>		
Mesopolobus dubius	Schönrogge et al. 2000	
M. fuscipes	Schönrogge et al. 2000	*
M. tibialis	Schönrogge et al. 2000	
M. xanthocerus	Schönrogge et al. 2000	
<b>23. Andricus lucidus ag. (HEDGEHOG GALL)</b>		
Synergus umbraculus	Walker ® (2000)	*
Sycophila biguttata	Walker ® (2001)	
Mesopolobus sericeus	Walker ® (2000)	*
Eupelmus urozonus	Walker ® (2002)	
<b>24. Andricus lucidus sexual</b>		
Torymus flavipes (= auratus)	Walker ® (2002)	
Eupelmus urozonus	Williams ® (2005)	*
<b>25. Andricus nudus ag. (MALPIGHI'S GALL)</b>		
Synergus nervosus	Bowdrey ® (2005)	
<b>26. Andricus nudus sexual (BALD-SEED GALL)</b>		
(none known)		
<b>27. Andricus quadrilineatus ag.</b>		
Synergus albipes	RES Handbook 1963	
S. gallaepomiformis	RES Handbook 1963	
S. nervosus	RES Handbook 1963	
Torymus flavipes	Askew 1961	
M. xanthocerus	Askew 1961	
Aulogymnus arsames	Askew 1960	
A. eudoreschus	Askew 1960	
<b>28. Andricus quercuscalicis ag. (KNOPPER GALL)</b>		
Synergus gallaepomiformis	Schönrogge et al. 1996	*
S. nervosus	Williams ® (1996)	*
S. pallicornis	Hails et al. 1990 (1982)	
S. umbraculus	Schönrogge et al. 1996	*
Eurytoma brunniventris	Schönrogge et al. 1996	*
Sycophila biguttata	Hails et al. 1990 (® 1986)	
Megastigmus dorsalis	Schönrogge et al. 1996	*
M. stigmatizans	Schönrogge et al. 1996	
Torymus auratus (=nitens)	Schönrogge et al. 1996	*
T. cyaneus	Hails et al. 1990 (®1976)	
T. geranii	Hails et al. 1990 (® 1988)	
Ormyrus nitidulus	Schönrogge et al. 1996	



	AUTHORITY	REARED/RW
<b>28. Andricus quercuscalicis ag. (KNOPPER GALL) continued</b>		
Cecidostiba fungosa	Schönrogge et al. 2000	*
C. semifascia	Schönrogge et al. 1996	*
Mesopolobus amaenus	Hails et al. 1990 (© 1979)	*
M. sericeus	Hails et al. 1990 (© 1986)	*
M. tibialis	Schönrogge et al. 2000	*
Arthrolytus ocellus	Hails et al. 1990 (© 1986)	
Eupelmus urozonus	Hails et al. 1990 (© 1988)	*
E. vesicularis	Ellis (© 2005)	
Gelis formicarius	Hails et al. 1990 (© 1986)	
Mastrus deminuens (=castaneus)	Hails et al. 1990 (© 1984)	
Spilomicrus stigmatalis	Hails et al. 1990 (© 1984)	
<b>29. Andricus quercuscalicis sexual</b>		
Mesopolobus dubius	Schönrogge et al. 2000	*
M. fuscipes	Notton 1988	*
M. tibialis	Notton 1988	*
M xanthocerus	Notton 1988	
Aprostocetus aethiops	Hails/Walker © (1991)	
Pediobius clita	Pat Walker © (1991)	
<b>30. Andricus quercuscorticis ag.</b>		
Synergus incrassatus	RES Handbook 1963	
<b>31. Andricus quercuscorticis sexual</b>		
Synergus incrassatus	Williams © (1996)	*
<b>32. Andricus quercusradicis ag. (TRUFFLE GALL)</b>		
Synergus incrassatus	RES Handbook 1963	
Torymus erucarum	Askew 1961	
T. formosus	Askew © (1995)	
T. nobilis	Askew 1961	
T. scutellaris	Askew 1961	
Cecidostiba geganius	Askew 1961	
<b>33. Andricus quercusradicis sexual (KNOT GALL)</b>		
Ceroptres arator	RES Handbook 1963	
Saphonecrus connatus	RES Handbook 1963	
Synergus apicalis	RES Handbook 1963	*
S. rotundiventris	RES Handbook 1963	
Megastigmus dorsalis	Williams © 2000	*
<b>34. Andricus quercusramuli ag. THE AUTUMN GALL)</b>		
Mesopolobus sericeus	Askew pc	
<b>35. Andricus quercusramuli sexual (COTTON-WOOL GALL)</b>		
Synergus gallaepomiformis,	RES Handbook 1963	
Torymus flavipes	Askew 1961	
Cecidostiba fungosa	Frankum © 2004	
Aulogymnus gallarum	Askew 1961	
A. skianeuros	Frankum © 2004	
<b>36. Andricus rhizomae ag.</b>		
(none known)		
<b>37. Andricus seminationis ag. (SPINDLE GALL)</b>		
Synergus albipes,	RES Handbook 1963	
S. gallaepomiformis,	Askew 1961	
S. nervosus,	Askew 1961	
Torymus flavipes	Askew 1961	
Mesopolobus sericeus	Frankum © 2004	
Aprostocetus aethiops	Burton © (2010)	
<b>38. Andricus solitarius ag.</b>		
Synergus gallaepomiformis	RES Handbook 1963	
S. nervosus	RES Handbook 1963	
Eurytoma brunniventris	Askew 1961	
Mesopolobus amaenus	Askew 1961	
M. sericeus	Askew 1961	
Eupelmus urozonus	Askew 1961	



	AUTHORITY	REARED/RW
<b>39. Andricus solitarius sexual</b>		
(none known)		
<b>40. Andricus testaceipes ag. (RED-BARNACLE GALL)</b>		
Ceroptres arator	RES Handbook 1963	
Synergus incrassatus	RES Handbook 1963	
Eurytoma brunniventris	Askew 1961	
Torymus nobilis	Gibbs © (2000)	
Ormyrus nitidulus	Jennings © (2003)	
Caenacis lauta	Askew 1961	
Eupelmus urozonus	Askew 1961	
<b>41. Andricus testaceipes sexual (LEAF-VEIN GALL)</b>		
(none known)		
<b>42. Aphelonyx cerricola ag.</b>		
Synergus apicalis	Williams © (2005)	*
S. gallaepomiformis	Williams © (2004)	*
S. incrassatus	Williams © (2003)	*
S. variabilis	Williams © (2005)	*
Eurytoma brunniventris	Walker © (2001)	*
Sycophila biguttata,	Walker © (2001)	*
Megastigmus dorsalis	Williams © (2002)	*
Torymus auratus (=nitens)	Raper © (2000)	
Ormyrus nitidulus	Williams © (2004)	*
O. pomaceus	Williams © (2003)	*
Cecidostiba fungosa	Williams © (2004)	*
C. semifascia	Williams © (2004)	*
Hobbya stenonota	Williams © (2006)	*
Mesopolobus sericeus	Williams © (2004)	*
Gelis areator	Williams © (2002)	*
<b>43. Biorhiza pallida ag.</b>		
Torymus nobilis	Askew 1961	
T. roboris	Cardiff Museum 1960	
<b>44. Biorhiza pallida sexual (OAK-APPLE)</b>		
Synergus gallaepomiformis	RES Handbook 1963	*
Synergus umbraculus	Williams © (2002)	*
Eurytoma brunniventris	Askew 1961	
Sycophila variegata	Askew 1961	
Megastigmus dorsalis	Askew 1961	*
Torymus affinis	Askew 1960	*
T. auratus (=nitens)	Askew 1961	*
T. flavipes	Askew 1961	*
T. geranii	Askew 1961	*
Ormyrus pomaceus	Askew 1961	
Cecidostiba fungosa	Askew 1961	*
C. semifascia	Askew 1961	*
Hobbya stenonota	Askew 1961	*
Mesopolobus amaenus	Askew 1961	*
M. dubius	Askew 1961	*
M. sericeus	Askew 1961	*
M. tibialis	Askew 1961	
M. xanthocerus	Askew 1961	*
Eupelmus urozonus	Askew 1961	*
Aulogymnus skianeuros	Askew 1960	*
Aprostocetus aethiops	Williams © 2004	*
Baryscapus diaphantus	Askew 1961	*
<b>45. Callirhytis bella sexual</b>		
(none known)		
<b>46. Callirhytis erythrocephala ag.</b>		
(none known)		



	AUTHORITY	REARED/W
<b>47. Callirhytis erythrocephala sexual</b>		
Eurytoma brunniventris,	Askew 1961	
Megastigmus dorsalis	Askew 1961	
<b>48. Cynips agama ag. (YELLOW-PEA GALL)</b>		
one known)		
<b>49. Cynips disticha ag. (TWO-CELL GALL)</b>		
Eurytoma brunniventris	Askew 1961	
Torymus flavipes	Askew 1961	
Mesopolobus sericeus	Askew 1961	
<b>50. Cynips disticha sexual</b>		
(none known)		
<b>51. Cynips divisa ag. (RED-PEA GALL)</b>		
Synergus albipes	RES Handbook 1963	*
S. nervosus	RES Handbook 1963	*
S. pallicornis	Gilbert et al. 1994	
Eurytoma brunniventris	Askew 1961	*
Sycophila biguttata	Askew 1961	*
Torymus auratus (=nitens)	Askew 1961	*
T. cyaneus	Askew 1960	*
T. flavipes	Askew 1961	*
T. geranii	Askew 1961	*
Caenacis lauta	Askew 1961	
Mesopolobus dubius	Askew 1961	
M. fasciventris	Askew 1961	*
M. sericeus	Askew 1961	*
Eupelmus urozonus	Askew 1961	*
Aprostocetus aethiops	Askew 1961	
<b>52. Cynips divisa sexual (RED-WART GALL)</b>		
(none known)		
<b>53. Cynips longiventris ag. (STRIPED-PEA GALL)</b>		
Eurytoma brunniventris	Askew 1961	
Sycophila biguttata	Askew 1961	
Torymus auratus (=nitens)	Askew 1961	*
T. cyaneus	Askew 1960	*
T. flavipes	Askew 1961	*
T. geranii	Askew 1961	
Mesopolobus fasciventris	Askew 1961	
M. sericeus	Askew 1961	*
Eupelmus urozonus	Askew 1961	*
Aprostocetus aethiops	Askew 1961	
<b>54. Cynips longiventris sexual (GREEN VELVET-BUD GALL)</b>		
S. pallicornis	RES Handbook 1963	
Mesopolobus fuscipes	Askew 1961	
<b>55. Cynips quercusfolii ag. (CHERRY GALL)</b>		
Synergus albipes	Williams © 1999	*
S. pallicornis	RES Handbook 1963	
Eurytoma brunniventris	Askew 1961	
Sycophila biguttata	Askew 1961	*
Megastigmus dorsalis	Askew 1961	
Torymus auratus (=nitens)	Askew 1961	*
T. cyaneus	Askew 1960	
T. flavipes	Williams © 1997	*
Mesopolobus fasciventris	Askew 1961	
M. sericeus	Askew 1961	
Aprostocetus aethiops	Askew 1961	
<b>56. Cynips quercusfolii sexual (VIOLET-EGG GALL)</b>		
Synergus gallaepomiformis	Askew 1961	
Mesopolobus fuscipes	Askew 1961	



	AUTHORITY	REARED/W
<b>57. Neuroterus albipes ag. (SMOOTH SPANGLE)</b>		
Synergus albipes	RES Handbook 1963	
S. nervosus,	RES Handbook 1963	
Torymus flavipes	Askew 1961	
Mesopolobus fasciiventris	Askew 1961	
M. tibialis,	Askew 1961	*
Aulogymnus gallarum	Askew 1960	
Pediobius clita	Askew 1961	
P. lysis	Askew 1961	
<b>58. Neuroterus albipes sexual (SCHENK'S GALL)</b>		
Eurytoma brunniventris	Askew 1961	
Torymus flavipes	Askew 1961	
Ormocerus latus	Askew 1961	
O. vernalis	Askew 1961	
Mesopolobus fasciiventris	Askew 1961	
M. fuscipes	Askew 1961	
M. tibialis	Askew 1961	
Aulogymnus arsames	Askew 1961	
Aprostocetus aethiops	Askew 1961	
<b>59. Neuroterus anthracinus ag. (OYSTER GALL)</b>		
Synergus albipes	RES Handbook 1963	
S. gallaepomiformis	RES Handbook 1963	
S. nervosus	RES Handbook 1963	*
Eurytoma brunniventris	Askew 1961	
Torymus geranii	Askew 1961	*
Mesopolobus fasciiventris	Askew 1961	
M. sericeus	Askew 1961	
Eupelmus urozonus	Askew 1961	
Aulogymnus arsames	Askew 1960	
Aprostocetus aethiops	Askew 1961	
<b>60. Neuroterus anthracinus sexual</b>		
Mesopolobus fuscipes	Askew 1961	
M. tibialis	Askew 1961	
M. xanthocerus	Askew 1961	
<b>61. Neuroterus aprilius ag.</b>		
(none known)		
<b>62. Neuroterus aprilius sexual (APRIL-BUD GALL)</b>		
Mesopolobus fuscipes	Askew 1961	
Aulogymnus arsames	Askew 1960	
<b>63. Neuroterus numismalis ag. (SILK-BUTTON)</b>		
Synergus albipes	Askew 1961	
Torymus flavipes	Askew 1961	
Mesopolobus fasciiventris	Askew 1961	
M. tibialis	Askew 1961	
Aulogymnus gallarum	Askew 1960	
Pediobius lysis	Askew 1961	
<b>64. Neuroterus numismalis sexual (BLISTER-GALL)</b>		
Synergus albipes	RES Handbook 1963	
Eurytoma brunniventris	Askew 1961	
Torymus flavipes	Askew 1961	
Mesopolobus fasciiventris	Askew 1961	
M. fuscipes	Askew 1961	
M. sericeus	Askew 1961	
M. tibialis	Askew 1961	
Aprostocetus aethiops	Askew 1961	
Aulogymnus arsames	Askew 1960	



	AUTHORITY	REARED/W
<b>65. Neuroterus quercusbaccarum ag. (COMMON SPANGLE)</b>		
Synergus albipes	RES Handbook 1963	
S. nervosus	RES Handbook 1963	*
Eurytoma brunniventris	Askew 1961	
Torymus flavipes	Askew 1961	*
Mesopolobus dubius	Askew 1961	
M. fasciiventris	Askew 1961	
M. tibialis	Askew 1961	
Aulogymnus gallarum	Askew 1960	
A. gallarum f. pulchra	Askew 1960	
Pediobius clita	Williams © (1998)	*
Pediobius lysis	Askew © (over the years)	
<b>66. Neuroterus quercusbaccarum sexual (CURRANT GALL)</b>		
Synergus albipes	RES Handbook 1963	*
S. apicalis	Boyd © (1998)	*
S. gallaepomiformis	RES Handbook 1963	
S. nervosus	RES Handbook 1963	*
S. thumacerus	Boyd © (1998)	
Eurytoma brunniventris	Askew 1961	*
Torymus auratus (=nitens)	Askew 1961	
T. flavipes	Askew 1961	*
Mesopolobus sericeus	Askew 1961	*
M. tibialis,	Askew 1961	*
Eupelmus urozonus	Askew 1961	
Aulogymnus arsames	Askew 1960	
A. gallarum	Askew 1960	*
<b>67. Neuroterus saliens agamic</b>		
<b>68. Neuroterus saliens sexual</b>		
Eurytoma brunniventris	Chinery © (2007)	
Torymus scutellaris	Chinery © (2007)	
Cecidostiba fungosa	Chinery © (2007)	
Cecidostiba semifascia	Chinery © (2007)	
<b>69. Neuroterus tricolor ag. (CUPPED SPANGLE)</b>		
T. flavipes	Askew 1961	
<b>70. Neuroterus tricolor sexual (HAIRY-PEA GALL)</b>		
S. gallaepomiformis	RES Handbook 1963	
S. thumacerus	RES Handbook 1963	
Eurytoma brunniventris	Askew 1961	
Mesopolobus tibialis	Askew 1961	
<b>71. Trigonaspis megaptera ag. (KIDNEY GALL)</b>		
Synergus albipes	RES Handbook 1963	
S. nervosus	RES Handbook 1963	
S. thumacerus	Askew © 1960	
<b>72. Trigonaspis megaptera sexual (PINK-BUD GALL)</b>		
Synergus gallaepomiformis	RES Handbook 1963	
S. thumacerus	RES Handbook 1963	
Torymus fastuosus	Askew 1960	
Mesopolobus dubius	Ellis © (2000)	
M. fuscipes	Askew 2000	
M. tibialis	Askew 2000	
Aulogymnus trilineatus	Askew 2000	
<b>76. Trioza remota</b>		
Tamarixia pubescens	Chinery © (2007)	
<b>79. Macrodiplosis pustularis (=dryobia)</b>		
Torymus chloromerus	Jennings © (2000)	
<b>81. Polystepha malpighii</b>		
Quadrastichus anysis	Entwistle © (1999)	



**References:** ('Sources of information', on P. 204-209, gives full references for these)

- Askew pc**; various personal communications, from 1996 to date.  
**Askew 1960**; R.R. Askew, Entomologists Monthly Magazine  
**Askew 1960**; R.R. Askew, September, 1960, Proceedings of Entomological Society of London.  
**Askew 1961**; R.R. Askew, May 1961, Transactions of the Society for British Entomology.  
**Askew 1961**; R.R. Askew, Nov 1961, Transactions of the Society for British Entomology.  
**Askew 1961**; R.R. Askew, The Entomologist  
**Askew 1961**; R.R. Askew, Entomophaga.  
**Askew 1965**; R. R. Askew, April 1965, Transactions of the British Society for Entomology.  
**Askew 1966**; R.R. Askew, May 1966, The Entomologist.  
**Askew 2000**; R. R. Askew, letter to Hewett A. Ellis  
**Askew/Neill 1993**; R.R. Askew & M.P. Neill, 1993, The Entomologist.  
**Benson 1945**; R.B. Benson, December 1945, The Entomologist.  
**Ellis 2002**; Hewett A. Ellis Spring 2002, Cecidology.  
**Ellis 2006**; Hewett A. Ellis, Spring 2006, Cecidology.  
**Entwistle**; Philip F. Entwistle, various correspondence from 1996 to date.  
**Graham/Gijswijt**; M.W.R. de Vere Graham & M.J. Gijswijt, March 1998, Leiden, Nationaal Natuurhistorisch Museum.  
**Gilbert et al**; Francis Gilbert, Charlotte Astbury, Jenny Bedingfield, Bruce Ennis, Samantha Lawson & Tracey Stuck, 1994, Plant Galls.  
**Hails et al 1990**; R.S. Hails, R.R. Askew & D.G. Notton, 1990, The Entomologist.  
**Jennings 2001**; Malcolm Jennings, 2001, Entomologists Monthly Magazine.  
**Notton 1998**; D.G. Notton, Cecidology.  
**RES Handbook 1963**; R.D. Eady & J. Quinlan, 1963, Royal Entomological Society of London.  
**Schönrogge et al. 1996**; K. Schönrogge, G.N. Stone & M.J. Crawley, 1996, Ecological Entomology.  
**Schönrogge et al. 2000**; K. Schönrogge, P. Walker, M.J. Crawley, 2000, Ecological Entomology.  
**Walker**; Pat Walker, various correspondence, from 2000 – date.

**Terms:**

® = reared by:

Askew	Dr R.R. Askew, Tarporley, Cheshire
Bowdrey	Jerry Bowdrey, Colchester Museum, Essex
Boyd	John Boyd, Draycott, Somerset
Burton	Gareth Burton, University of Leicester
Chinery	Michael Chinery, Hundon, Suffolk
Dodd	Scotty Dodd, Guildford
Ellis	Hewett A. Ellis, North Shields
Entwistle	Dr Philip Entwistle, Spinningdale, Sutherland
Gibbs	David Gibbs, Bristol
Ellis	Hewett A. Ellis, Tynemouth
Frankum	Maggie Frankum, Leicester
Frost	Don Frost, Hastings, Sussex
Hails	Dr Rosie Hails, Silwood Park
Ismay	Dr John Ismay, Oxford University Museum
Jennings	Malcolm Jennings, Kent
Parsons	Tony Parsons, Crewkerne, Somerset
Randolph	Simon Randolph, Bristol
Raper	Chris Raper, Berkshire
Walker	Dr Pat Walker, Silwood Park & Chobham, Surrey
RW	Robin Williams, Wedmore, Somerset
Williams	Robin Williams, Wedmore, Somerset
Wurzell	Brian Wurzell, London

(1961) year of rearing  
 1961 year when paper published

