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THE WOODLICE OR ONISCOIDEA OF CANADA (*Crustacea, Isopoda*)

By E. M. WALKER.



THE terrestrial Isopoda, or Oniscoidea, variously known as woodlice, sowbugs, pillbugs or slaters, have never been favourites with collectors and the paucity of published data relating to the Canadian species is plainly indicated in a recent article by Frits Johansen,¹ in which a full summary is given of our present knowledge of the distribution of this group in the territory indicated in the title. Definite records of nine species are brought together in this paper and of these but six are from Canada and most of them from very few localities. These species are *Ligyda pallasi*, *Oniscus asellus*, *Porcellio scaber*, *P. rathkei*, *P. spinicornis* and *Cylisticus convexus*.

Since Johansen's paper was published two species have been added to the Canadian fauna by A. R. Fee², viz., *Trichoniscus papillicornis* and *Ligidium gracile*, the former being one of the species previously known from Alaska.

As the present writer has given some attention to the Oniscoidea during recent years and has gathered a number of additional records, including those of species hitherto unknown from Canada, it has seemed worth while to make these available for the student, fragmentary as they are. To stimulate further interest in the subject a key to the genera and species represented in our fauna is given and this is made as simple as seems compatible with usefulness and accuracy, with the omission, as far as possible, of technical terms.

In regard to the general distribution of terrestrial isopods in Canada we believe that certain statements made in Richardson's admirable treatise³ and in Johansen's paper (loc. cit.) are misleading. Records of certain species from Alaska, Labrador and Greenland as well as from the United States naturally give the impression that such species are probably generally distributed in Canada, *Porcellio laevis*, e.g., has been

recorded from Unalaska, in the Aleutian Islands, and is said by Richardson to be world-wide in distribution, a statement which is repeated by Johansen. Richardson's records, however, with this one exception, point to a distribution in North America well to the south of the international boundary, the most northerly localities mentioned being Cincinnati, O. and Washington, D.C. The majority of the localities are in the southern and southwestern states and throughout the tropical regions of both hemispheres, and although it occurs throughout the greater part of Europe, it is, according to Budde-Lund⁴ "especially found in cellars beneath bakeries, or in other place where a rather high and uniform temperature prevails, sometimes also in refuse-heaps close to the towns." I cannot believe that *P. laevis* is native to Alaska. I have searched in vain for it in Canada, although it very probably occurs here as an introduced form when the proper conditions of warmth and moisture obtain.

Another species whose distribution is said to be world-wide is *Porcellio scaber*, and Johansen concludes his account of its range with the sentence "There is every reason to believe that this species is found all over Canada and Alaska right up to the limit of trees." Certainly the records from Hopedale, Labrador, St. Paul Island, Alaska, Greenland, Iceland and Kamchatka seem to support this view, but it will be noticed that these are all maritime localities. Its occurrence inland in the north is by no means certain. In Ontario it occurs abundantly on Long Point, Lake Erie, rarely at Toronto, and apparently not at all at any distance from the Great Lakes.

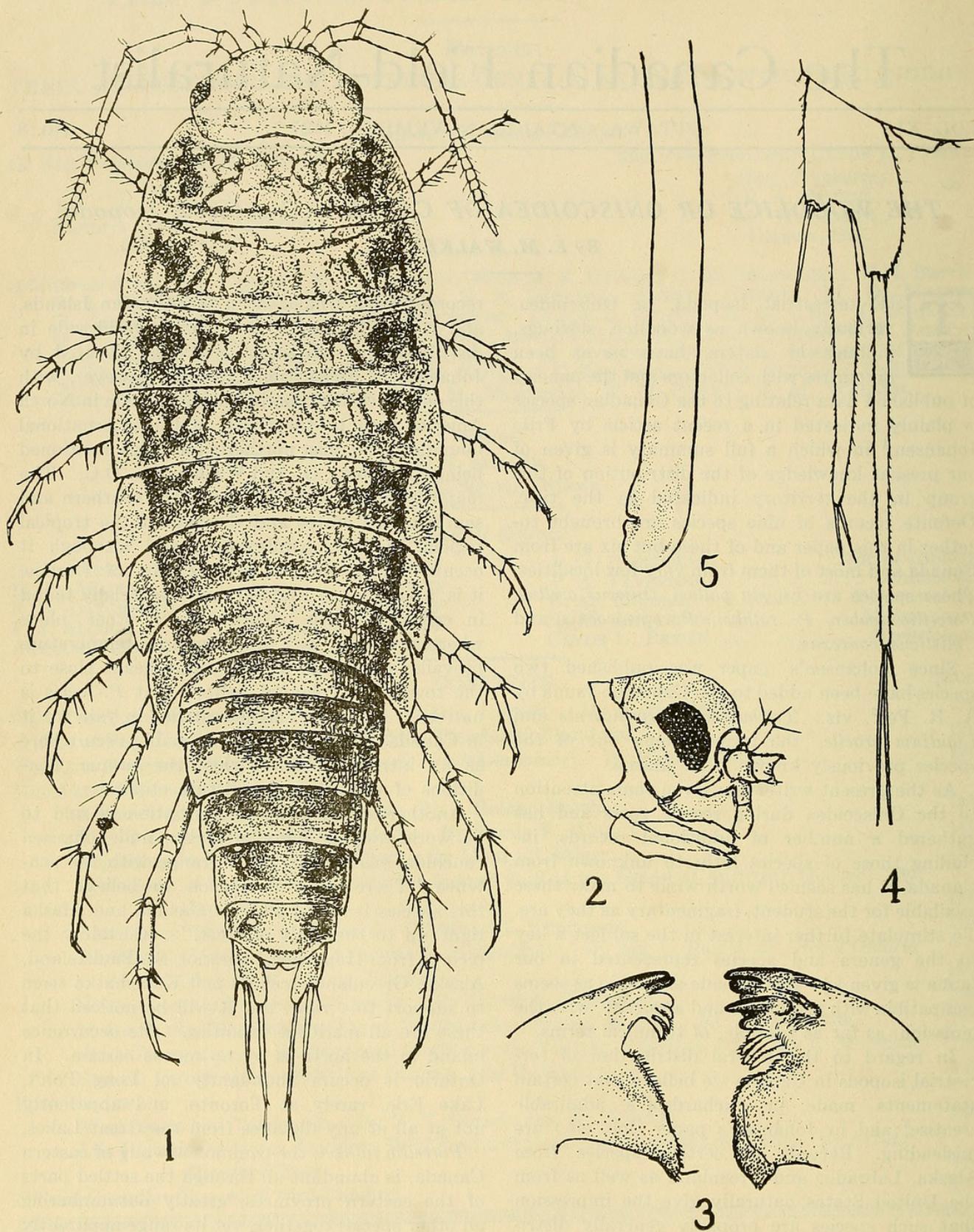
Porcellio rathkei, the common sowbug of eastern Canada, is abundant all through the settled parts of the eastern provinces, greatly outnumbering all other species together, yet its range apparently does not extend far into the Canadian Zone. I have searched in the most favourable-looking places in northern Ontario and Quebec (Lake Nipigon, Lake Abitibi, Godbout) but found no traces of this or any other land isopod. While I

¹"On the Woodlice (*Oniscoidea*) occurring in Canada and Alaska," (*Canadian Field-Naturalist* XL, No. 8, November, 1926).

²"The Isopoda of Departure Bay and vicinity, with descriptions of new species, variations, and colour notes," (*Contributions to Canadian Biology and Fisheries*, New Series, Vol. III, No. 2, 1926).

³Richardson, Harriet. "A Monograph of the Isopoda of North America," (*Bull. U.S. Nat. Museum*, No. 54, 1905).

⁴Quoted by Sars, G.O., in "An Account of the Crustacea of Norway, Vol. III, Isopoda, p. 182."



am not prepared to state with finality that no species of Oniscoidea occur in these northern regions of the interior, the evidence thus far gained points to the probability of this conclusion.

Indeed, from the manner of occurrence of most of our species I am inclined to believe that all our Oniscidae are introduced, and that our only native forms belong to the Ligydidae and Trichoniscidae.

Key to Families, Genera and Species of Oniscoidea found in Canada.

The following key is adapted in part from those of Richardson (loc. cit.) but is greatly simplified. To those who are not familiar with the external anatomy of the group, some explanation of terms may be useful.

The "antennae" are the large or second pair of feelers as distinguished from the "antennules" or first pair. They are also called "second antennae" and "outer antennae." The flagellum of the antennae is the terminal series of small segments, borne by the peduncle. The peduncle of the antennae consists of the first five segments which are larger than those of the flagellum. The uropoda are the last pair of appendages, borne at the end of the abdomen. Its peduncle is a single basal segment.

1. Flagellum of antennae with many segments (10+), head below the eyes not produced into lobes visible in dorsal view, mandibles with a well-developed molar expansion Fam. LIGYDIDAE, 2
 - 1a. Flagellum of antennae with not more than 5 segments; head below each eye produced into a lobe which is visible (except in *Armadillidium*) in a dorsal view 4
2. Basal segment of uropoda not produced into a process at the inner distal angle, the branches equal in length; last segment of abdomen large with distinct lateral parts; large forms found on the sea shore *Ligyda* (*L. pallasi*)
- 2a. Basal segment of uropoda produced into a process at the inner distal angle, the branches unequal in length and thickness; last segment of abdomen small with lateral parts obsolete; rather small forms found in damp woods *Ligidium*, 3
3. Eyes much longer than broad, each composed of about 60 parts; inner branch of uropoda about one-sixth longer than outer branch, the two terminal setae about half as long as the inner branch; western *L. gracile*
- 3a. Eyes about as broad as long, each composed of about 100 facets, inner branch of uropoda about two-thirds longer than outer branch, the two terminal setae scarcely one-fourth as long as the inner branch; eastern *L. longicaudatum*
4. Mandibles with a distinct molar expansion; eyes minute with very few facets; both branches of uropoda styliform; small forms 4 mm. or less in length TRICHONISCIDAE, 5
 - 4a. Mandibles without a distinct molar expansion; eyes with numerous facets; the adults usually over 10 mm. in length 7
5. Body sculptured dorsally with longitudinal rows of tubercles. Segments of thorax separated laterally by distinct notches; abdomen not abruptly narrower than thorax, with well developed side plates *Haplophthalmus* (*H. danicus*)
 - 5a. Body not sculptured dorsally with longitudinal rows of tubercles; segments of thorax not separated laterally by distinct notches; abdomen abruptly narrower than thorax with very small lateral parts. *Trichoniscus*, 6
 6. Surface smooth; front of head straight with small lateral lobes; last three segments of peduncle of antennae without tubercle-like papillae *T. pusillus*
 - 6a. Surface covered with low tubercles; front of head somewhat produced with a slight median emargination, lateral lobes large; last 3 segments of peduncle of antennae bearing tubercle-like papillae along their inner margins *T. papillicornis*
 7. Uropoda extending beyond last segment of abdomen, the apex of which is angular; antennae longer than the first 3 thoracic segments; animal (except *Cylis icus*) incapable of rolling itself into a ball ONISCIDAE, 8
 - 7a. Uropoda not extending beyond last segment of abdomen, the apical margin of which is truncate; antennae shorter than the first 3 segments of the thorax; animal able to roll itself into a ball. . . . ARMADILLIDIIDAE
Armadillidium, 14
 8. Flagellum of antennae with 3 segments; abdomen with well-developed side-plates, not abruptly narrower than thorax *Oniscus* (*O. asellus*)
 - 8a. Flagellum of antennae with 2 segments 9
 9. Abdomen abruptly narrower than thorax, the side plates small; antero-lateral lobes of head inconspicuous *Metoponorthus* (*M. pruinosis*)
 - 9a. Abdomen not abruptly narrower than thorax, the side plates well developed; antero-lateral lobes of head prominent 10
 10. Body very convex, the animal capable of rolling itself into a ball; surface smooth. . . . *Cylisticus* (*C. convexus*)
 - 10a. Body moderately convex, the animal incapable of rolling itself into a ball, surface usually roughened *Porcellio*, 11
 11. Surface of body smooth; frontal lobe of head conically produced; first segment of flagellum of antennae longer than second segment (not yet recorded) *P. laevis*
 - 11a. Surface of body roughly granulated or tuberculate; frontal lobe of head rounded . . . 12
 12. Body grey without spots (except in var. *marmorata*); surface very rough with tubercles elevated and well-defined; segments of flagellum of antennae about equal in length; inner face of right mandible with 4-5 penicils, of left mandible with 7-8 penicils. . . . *P. scaber*
 - 12a. Body with spots; surface less rough; the tubercles rather low and not well-defined; segments of flagellum of antennae unequal; inner faces of both mandibles with 4-5 penicils 13

13. Second and third joints of antennae keeled on the outer face, the keel in each case produced distally into a distinct tooth; first segment of flagellum longer than second; colour yellowish-grey with conspicuous spots arranged in longitudinal series, the head and middle part of abdomen blackish; in fresh specimens a double row of conspicuous yellow patches along middle of thorax. *P. spincornis*
- 13a. Second and third joints of antennae keeled but without distinct projecting distal teeth; first segment of flagellum slightly shorter than second; colour very variable, but the head and abdomen not conspicuously darker than other parts, and the submedian double row of yellow patches absent. *P. ralhkei*
14. Head truncate in front, without median emargination, and not surpassed by the epistome. Outer branch of uropoda posteriorly truncate. *A. vulgare*
- 14a. Head with a small V-shaped notch in front, and surpassed by the epistome, which extends some distance in front. Outer branch of uropoda posteriorly rounded. *A. quadrifrons*

1. *Ligyda pallasii* (Brandt).

Brandon Island, Departure Bay, Vancouver Island, B.C., July 17, 1913. abundant on steep rocky shore. Prince Rupert, B.C., June 10-16, 1926, under loose flat stones on rocky shore of a sheltered bay, not very common.

The characters by which this species is separated from *L. oceanica* (L.) of the Atlantic are inaccurately stated by Richardson. The branches of the uropoda in *L. pallasii* are one-fifth instead of one-eighth as long as the entire body from the tip of the terminal abdominal segment. In *L. oceanica* the branches of the uropoda are not four times but only a little more than twice as long as the peduncle, their proportions being correctly shown in Sars' excellent figures. Stimpson's figure of *L. pallasii*, reproduced by Richardson, is relatively broader than any specimen that I have seen, although the largest females are considerably broader in proportion than the males and smaller females. The majority of specimens taken have a form and appearance more like Sars' figure of *L. oceanica* than Stimpson's figure of *L. pallasii*, but a comparison of specimens of the two species at once reveals the longer uropoda of *oceanica*, with longer and slenderer branches.

2. *Ligidium gracile* (Dana).

Departure Bay, V.I., July 13, 1913, not uncommon under pebbles at the edge of a small brook. Prince Rupert, B.C., June 10-21, 1926, abundant under dead leaves and damp bark in rich woods

These specimens agree with the brief descriptions of *L. tenue* Budde-Lund (1855) as well as that of *L. gracil* (Dana) (1885). In Richardson's key they run definitely to *L. tenue*, but *L. gracile* is separated from this and other species on the basis of the inner branch of the uropoda being "tipped with setae" instead of being "furnished with two long apical bristles." These two expressions mean the same, except that the number of bristles or setae is specified in the latter case. The description of *L. tenue* is very brief but the important characters of the uropoda agree well

with those of the British Columbia specimens. The abundance of this form in northern British Columbia and the apparent absence of any other species is strong evidence of its identity with *L. tenue*, which comes from Alaska. On the other hand the more detailed descriptions and figures of *L. gracile*, which comes from California, fit our species admirably, so that I feel confident that *L. tenue* and *L. gracile* are synonymous, the latter name having priority. *L. gracile* has been recently recorded from Departure Bay by Fee (loc. cit.).

In order to minimize further difficulties in the study of western material in this genus and to give definitely the characters of the species to which our records belong I have drawn the figures in the accompanying plate. They will also serve to bring out the differences between this species and the eastern *L. longicaudatum*.

3. *Ligidium longicaudatum* Stoller.

De Grassi Point, Lake Simcoe, Ont., July 26, 1915, a few specimens under wet pebbles at edge of small stream; Aug., 1915, a single specimen in wet moss in swamp; Sept 2, 1927, 7 young individuals in swamp near edge of creek. Near Richmond Hill, Ont., April 23-May 7, 1927, numerous under dead leaves and rubbish in permanently wet spots in a wood, on rich black humus; Credit River, Ont., near the Dundas highway, Oct. 19, 1926, common on a springy bank in a wood.

These specimens agree with Stoller's description of *L. longicaudatum*, the only species authentically known from eastern North America (Schenectady, N.Y.), since the American records of *L. hypnorum* have been discredited by Budde-Lund.

Stoller's figure, however, is not a satisfactory representation of the species which we have found. The specimen drawn was evidently contracted and the antennae appear somewhat too long, though they do vary considerably in length.

This is probably the species to which the record of *L. hypnorum* from Niagara belongs. We

believe it to be probably the only *Ligidium* in eastern Canada, if not in eastern North America.

L. longicaudatum differs from *L. gracile* in the somewhat broader form of the body with a shorter abdomen, longer antennae, larger and rounder eyes and longer inner branch of the uropoda, which is furnished with relatively shorter setae.

These two species of *Ligidium* inhabit similar situations, being apparently most at home in very wet places in woods. *L. longicaudatum* seems to be local. The only spots where I have found it abundantly are permanently wet from the presence of springs, but, on account of the slope of the land, are never flooded. I believe that such conditions are probably essential in the habitat of *L. longicaudatum*.

4. *Trichoniscus pusillus* Brandt.

St. Andrews, N.B., July 12, 1923, 8 specimens; Humber Valley, Toronto, April 8, June 2, 1927, abundant; near De Grassi Point, Lake Simcoe, Ont., June, 1927, abundant.

This small species was fairly common at St. Andrews under stones in the bed of a small forest stream which had nearly dried up. In the Humber Valley it is abundant under leaves and rubbish in damp spots in the woods, particularly in the rich black humus at the foot of the slopes. At Lake Simcoe it is also locally abundant under damp logs in the woods close to the margin of a creek and on the lake beach nearby. It is usually numerous when it occurs and moves with considerable rapidity.

Richardson records *T. pusillus* from North America but mentions no definite localities.

5. *Trichoniscus papillicornis* Richardson.

This species, originally described from a single specimen taken at Seldovia, Cook Inlet, Alaska, has recently been recorded by Fee (loc. cit.) from Hammond Bay, B.C., where a single individual was taken from a tide-pool.

6. *Oniscus asellus* Linnaeus.

Toronto, Ont., April-November; Hemmingford, Que., July 18, 1927.

I first noticed this species at Toronto about 12 years ago in one of the Rosedale ravines. Since then it has become common in the city in gardens and sometimes in cellars. It appears to be restricted to the environs of the city and I believe that it has been introduced into this locality within comparatively recent years. At Hemmingford I found it under stones and boards in a yard where there was a large refuse heap.

Richardson records it also from Niagara, Ross⁵ from London and Johansen from Quebec city. It is also reported from Newfoundland and Greenland and is widely distributed in Europe and the eastern United States.

7. *Metoponorthus pruinosus* (Brandt).

De Grassi Point, Lake Simcoe, Ont., August 1924. A few specimens were found in a manure pile, together with *Porcellio rathkei*. I have not succeeded in finding it again.

This is the first Canadian record of this species, although it is widely distributed in other parts of the world.

8. *Porcellio scaber* Latreille.

St. Andrews, N.B., July 1923, under driftwood and logs on the sea-shore; Belleville, Ont., June 24, 1927, five specimens (J. L. Hart); near Toronto, Ont., April 17, 1927, one specimen; Long Point, Lake Erie, Ont., under bark and logs along the edge of marshes near the beach; Departure Bay, Vancouver Island, B.C., common; Victoria, B.C., common (Norma Ford).

This is the common wood-louse on the coast region of British Columbia, but I did not find it at Prince Rupert, where I spent three weeks during June, 1926. Dr. Norma Ford, who collected it at Victoria, found several specimens of the spotted form (var. *marmorata*). None of this form are represented in a long series from Long Point, Ont.

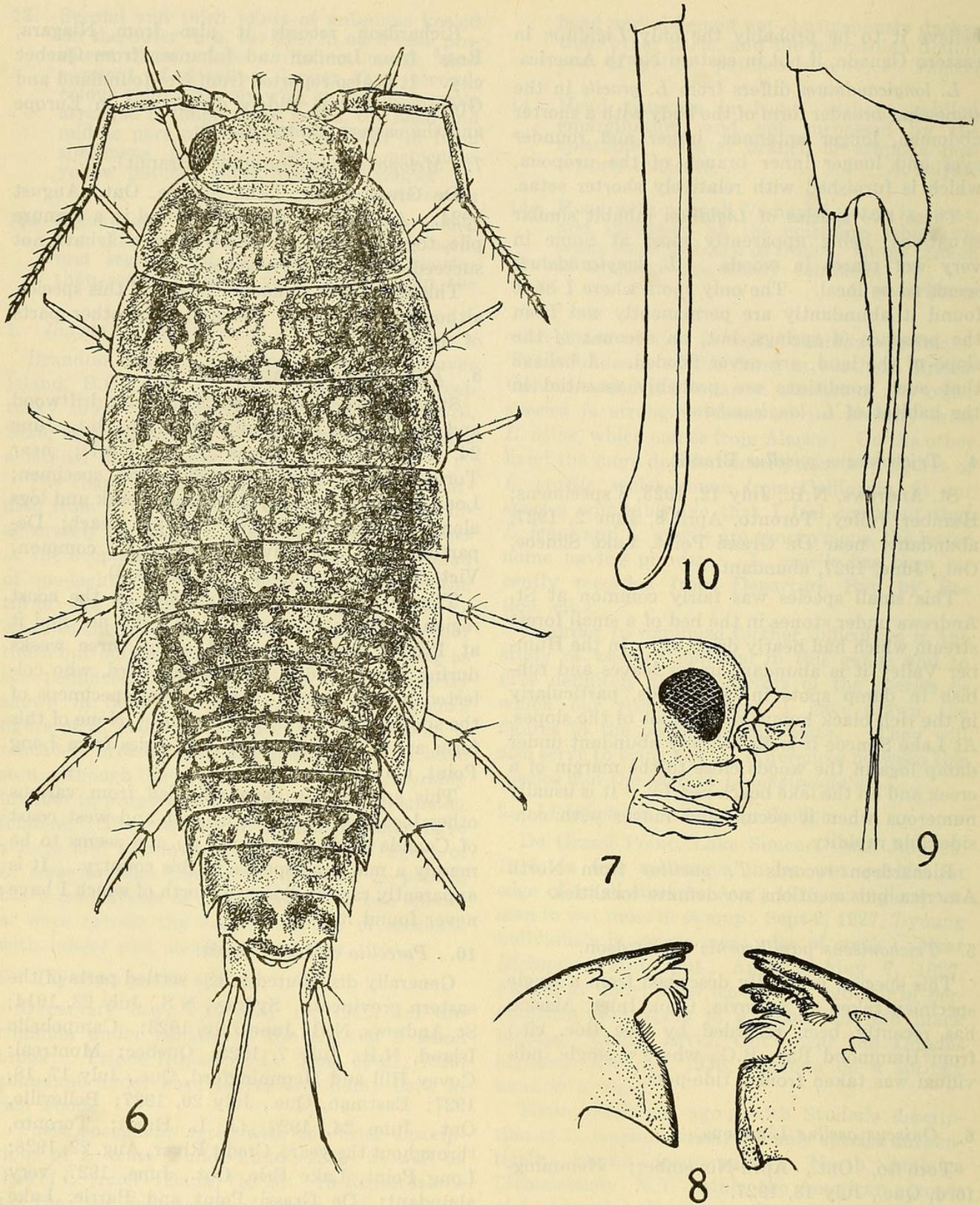
This species has been recorded from various other localities on both the east and west coast of Canada (vide Johansen, l.c.) and seems to be mainly a maritime species in this country. It is apparently rare at Toronto, north of which I have never found it.

10. *Porcellio rathkei* Brandt.

Generally distributed in the settled parts of the eastern provinces. Sydney, N.S., July 23, 1914; St. Andrews, N.B., June-July, 1923; Campobello Island, N.B., July 7, 1923; Quebec; Montreal; Covey Hill and Hemmingford, Que., July 17, 18, 1927; Eastman, Que., July 20, 1927; Belleville, Ont., June 24, 1927, (J. L. Hart); Toronto, throughout the year; Credit River, Aug. 22, 1926; Long Point, Lake Erie, Ont., June, 1927, very abundant; De Grassi Point and Barrie, Lake Simcoe, abundant; Galt, Ont., (M. Pettigrew); Camperdown, Ont., (Norma Ford); Sparrow Lake (J. L. Hart); Brockville, July 24, 1927; Ottawa (Johansen).

This very variable species is the common wood-louse of the east and greatly outnumbers all

⁵ Ross, W. A., Report on Insects of the Year, Div. No. 7, Niagara District, 44th Ann. Rep. Ent. Soc., Ont., 1914, pp. 23-25.



Figs. 1 to 5, *Ligidium gracile* (Stimpson).
 1, adult female; 2, right lateral view of head;
 3, ventral view of distal part of mandibles; 4,
 left uropod; 5, male gonostyle.

Figs. 6 to 10, *Ligidium longicaudatum* Stoller.
 6, adult female; 7, right lateral view of head;
 8, ventral view of distal part of mandibles; 9,
 left uropod; 10, male gonostyle.

other species taken together. It is abundant under damp boards, logs, stones and decaying leaves, in rotten wood, refuse and manure piles, in woods as well as in gardens and fields. It is frequently absent, however, in dense forests and appears to be confined to the more or less settled districts. I failed to find it in the Lake Nipigon district, at Lake Abitibi and at Godbout, Que., on the north shore of the lower St. Lawrence. I am inclined to the belief already expressed, that it is, like most of our wood-lice, an introduced species.

11. *Porcellio spinicornis* Say.

Hemmingford, Que., July 18, 1927, a few specimens under rubbish and boards in a yard; Belleville, Ont., June 24, 1927 (J. L. Hart); Toronto, Ont., May 24, 1921 (Stuart Thompson); Parkdale, Toronto, under bricks in a yard (Norma Ford); Humber Valley, May 22-27, 1927, under limestone blocks in the shade of bushes, very local. Also recorded from Niagara by Stuxberg, and Rockcliffe, Ont., by Johansen.

This distinctly marked species is apparently not rare, although decidedly local.

12. *Cylisticus convexus* (De Geer).

Hemmingford, Que., July 12, 1927; Brockville, Ont., July 24, 1927; Belleville, Ont., June 24, 1927 (J. L. Hart); Toronto, Ont., May-Nov. 29, Humber Valley, May 27, 1927, abundant; De Grassi Point, Lake Simcoe, June-Aug., 1927; Long Point, Lake Erie, Ont., June 2-9, 1927 (S. Logier, EM.W.).

Next to *Porcellio rathkei* this is the commonest of the larger wood-lice in eastern Canada and is widely distributed, although very much more local than the last-named species. It is found under wood and stones, often in comparatively dry situations, where it may be quite abundant, but it also occurs in rotten logs, in refuse-heaps and in vegetable gardens, in both urban and sylvan localities. It is our only outdoor species which can roll itself into a ball.

13. *Armadillidium vulgare* (Latr.).

Toronto, April 24, 1927, in kitchen sink, perhaps introduced with vegetables; in greenhouse of University Botanical Department, and outside in vicinity of same; one dead specimen found on outside stone steps of Library Building. Professor A. B. Klugh tells me has taken it in greenhouses at Kingston. It has also been reported by Ross (l.c.) as a troublesome species in greenhouses at London, Ont.

This species is evidently not a native of Canada and is apparently only accidentally found outside of greenhouses or their immediate vicinity. It is another of the species miscalled "world-wide" by Richardson.

14. *Armadillidium quadrifrons* Stoller.

Reported by Ross from greenhouses at London, Ont., where it was associated with *A. vulgare* and *Oniscus asellus*. Also recorded from greenhouses at Schenectady, N.Y., by Richardson.

A TALE OF FOUR CROWS

By NORMAN CRIDDLE, *Treesbank, Manitoba.*



wish it to be understood at the outset that this tale is not a contentious one. Whether crows are wise or foolish, harmful or useful are questions which may safely be left for others to decide. For myself I am content, in the words of Kipling to "Let a plain tale suffice."

On June 19, 1926, a neighbour called up over the telephone to offer us four nestling crows. A consultation at the laboratory resulted in Mr. R. M. White, a fellow worker, fetching the birds home and thereafter he and I took charge of them.

What wretched little objects those orphans were that first evening. They had been roughly poked from their nest with a pole and as suddenly found themselves in the clutches of their arch-enemy—man. Perhaps, under the circumstances, it was

no wonder that they crouched with fear or that apprehension was depicted in their every glance.

Fear still lurked in their eyes when I went to feed them next morning and it was necessary to pry their beaks open in order to get the food in. They ate, however, when once it was in their mouths, and one more bold than the rest uttered a faint squawk of satisfaction. A second attempt to feed them later on proved that they were still bent on a hunger strike but this was not so stubbornly maintained as before and the gurgling sound which accompanied the swallowing of food was less subdued than formerly and more indicative of satisfaction. But oh! what a change was manifested an hour later. Then four gaping mouths and a chorus of harsh cries enthusiastically greeted my approach and for a time the birds could not be fed fast enough to satisfy their



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