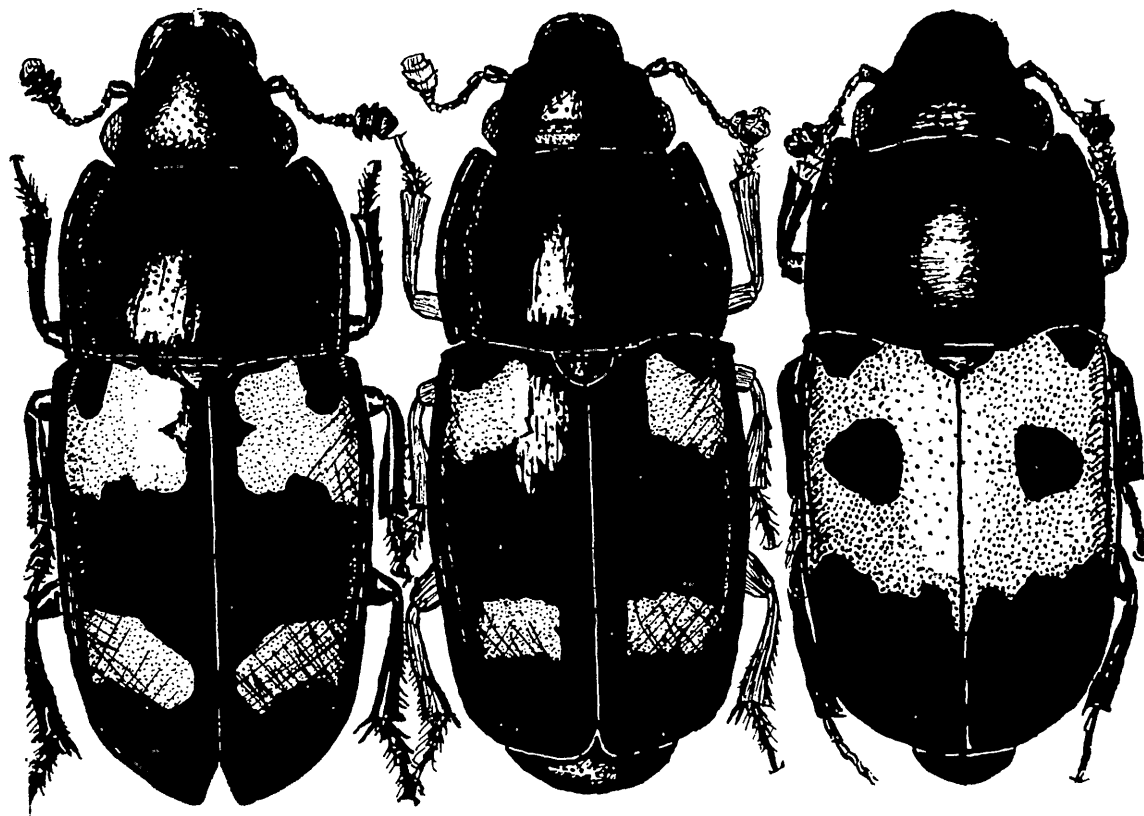


**An Annotated Bibliography
of the Genus *Glischrochilus* Reitter
(Coleoptera: Nitidulidae, Cryptarchinae)**

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**OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER
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Cover Photo: Left to right, Glischrochilus fasciatus (Oliver), G. quadrisignatus (L.), G. sanguinolentus (Oliver). From Dillon, E. S. and L. S. Dillon. 1972. A manual of common beetles of Eastern North America. Dover Publications, Inc. New York.

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An Annotated Bibliography of The Genus Glischrochilus Reitter.

(Coleoptera: Nitidulidae, Cryptarchinae)

Karl V. Miller and Roger N. Williams^{1/}

INTRODUCTION

The purpose of this circular is to consolidate the literature pertaining to the genus Glischrochilus. The objective has been to compile a summary of information on developmental biology, seasonal and geographical distribution, economic importance, habits, natural enemies, control, as well as information to assist in taxonomic studies.

The bibliographical information provided here was obtained by a thorough search of the libraries at The Ohio State University and the Ohio Agricultural Research and Development Center for the years 1730 to 1980. Photocopies or microfilms of material unavailable at these two libraries were obtained from the National Agricultural Library or from other university libraries. This literature search recovered most, but not all, checklists, faunal lists, and comprehensive publications which contained information on the genus.

Glischrochilus species occur in all faunal regions of the world. The numbers of species reported from each region are: Palearctic 18, Oriental 12, Nearctic 11, Neotropical 3, Australo-Papuan 2, and Ethiopian 2.

The genus Glischrochilus was erected by Reitter (1873). Grouvelle (1913) placed all of the species of the genus Ips Fabricius (nec DeGeer, 1775) in the genus Glischrochilus. The North American species of Glischrochilus were revised by Brown (1932). Jelinek (1975) revised the genus from the Oriental region and China. A revision of the Japanese Cryptarchinae including Glischrochilus by Hisamatus (1958) has not been widely accepted. The genotype is Silpha quadripustulatus L. = Silpha quadripunctatus L. The following description for the genus is from Parsons (1943):

"Large, oblong, glabrous, shining. Head large, broad; clypeus indistinct. Antennae about as long as the head, first segment long and moderately convex, second more convex and shorter than the third, three to eight becoming progressively shorter and more convex, club broad oval, moderately compact. Antennal grooves rather long, convergent. Labrum transverse, connate with the clypeus. Mandibles more or less strongly and bluntly bifid at tip, feebly bearded. Lacinia attenuate at tip, feebly bearded; second segment of palpi slightly longer than the third, fourth as long as the first. Lugula broad, emarginate at apex, paraglossae long, horn-shaped; palpi long and slender, second and third segments about of equal length. Mentum strongly transverse, deeply emarginate in front. Prothorax as broad or broader than the elytra, not margined at base. Scutellum small. Elytra entire, exposing none or only the tip of the pygidium; epipleurae narrow. Prosternum prolonged behind the coxae, laminiform, never attaining the metasternum. Anterior coxae open behind. First ventral segment nearly as

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long as the next three together, fourth longer than the third. Male eighth dorsal segment often invisible, visible only from beneath."

Entries are listed alphabetically by author except in cases where the publication is anonymous or more likely to be identified with the governmental agency under which it was published. The abbreviations in the citations follow the American standard for periodical title abbreviations which was published in Biological Abstracts, 45(13):4347-4361. The numbers in parentheses following the annotation represent the page numbers which include information on the genus Glischrochilus if they are different from the citation page numbers.

The authors would like to acknowledge the professional people whose advice, criticism, and knowledge were greatly appreciated: Drs. Roy W. Rings, George F. Shambaugh, Josef Jelinek, Ms. Susan Lowe, and Ms. Virgie Sapp. We would also like to thank Mrs. Viola Keillor for typing the manuscript.

WORLD DISTRIBUTION AND LIST OF THE SPECIES OF GLISCHROCHILUS REITTER

Glischrochilus Reitter

Glischrochilus Reitter, 1873, Verhandl. Naturforsch. Ver. Brünn, 12:162.

Genotype: Silpha quadripustulatus L. = Silpha quadripunctatus L. (Subsequent designation by Parsons, 1943).

Ips Fabricius, 1776. Gen. Insect. Chilonii, pp. 23, 213 (nec DeGeer, 1775).

Genotype: same as for Glischrochilus.

Librodor Reitter, 1884, Wein Entomol. Zeit., 3:269-270.

Genotype: Cryptarcha ipsoides Reitter. (Subsequent designation by Parsons, 1943).

Cryptarchips Reitter, 1911, Fauna Germanica. 3:37.

Genotype: Cryptarchips ipsoides Reitter (Subsequent designation by Jelínek, 1974).

Cephalips Arrow, 1937, Ann. Mag. Nat. Hist., 20(10):101.

Genotype: Librodor egregius Grouvelle.

Glischrochilus (L.) affinis Kirejtshuk

Palaearctic

Glischrochilus affinis Kirejtshuk, (in press). Proc. Zool. Inst. Acad. Sci., Leningrad.

Glischrochilus (L.) binaevus (Reitter)

Palaearctic

Cryptarcha binaevus Reitter, 1879, Deut. Entomol. Z. 23:218.

Librodor binaevus; Reitter, 1884, Nitid. Japans. 270.

Cryptarchips binaevus; Reitter, 1911. Fauna Germanica 3:37.

Glischrochilus binaevus; Grouvelle, 1913, Coleopt. Cat. 56:187.

Glischrochilus (L.) christophi (Reitter)

Palaearctic

Ips Christophi Reitter, 1879, Deut. Entomol. Z. 23:219.

Glischrochilus Christophi; Grouvelle, 1913, Coleopt. Cat. 56:187.

Glischrochilus (L.) clarkana (Wollaston)

Neotropical

Ips clarkana Wollaston, 1874. Thesaur. Entomol. Oxon. p. 71, t. 5, f. 10.

Glischrochilus clarkana; Grouvelle, 1913, Coleopt. Cat. 56:187.

Glischrochilus (L.) clavatus (Reitter)

Palaearctic

Librodor clavatus Reitter, 1884, Nitid. Japans, 270: 1885, 80.

Glischrochilus clavatus; Grouvelle, 1913, Coleopt. Cat. 56:187.

Cryptarchips clavatus; Jacobson, 1905, Zhuki Rossii, 889.

Glischrochilus (G.) confluentus (Say)

Nearctic

Engis confluenta Say, 1823, J. Acad. Nat. Sci. Philadelphia, 3:195.

Ips confluens; Lec., 1869, Writings of Thomas Say, 2:125.

Pityophagus confluens; Crotch, 1880, Checklist of the Coleopt. Amer., 49.

Glischrochilus confluentus; Grouvelle, 1913, Coleopt. Cat. 56:187.

Glischrochilus (G.) cruciatus (Motschulsky)

Palaearctic

Ips cruciatus Motsch., 1860, Schrenck's Reise II; 129.

Glischrochilus cruciatus; Grouvelle, 1913, Coleopt. Cat. 56:187.

Glischrochilus (L.) egregius cyclops Jelínek

Palaearctic

Glischrochilus egregius cyclops Jelínek, 1975, Acta Entomol. Bohemoslov., 72:137.

- Glischrochilus (L.) egregius egregius (Grouvelle) Oriental
Librodor egregius Grouvelle, 1892, Ann. Mus. Genova, 32:856.
Glischrochilus egregius; Grouvelle, 1913, Coleopt. Cat. 56:187.
Cephalips egregius; Arrow, 1937, Ann. Mag. Nat. Hist., 20(10):101.
Glischrochilus egregius egregius; Jelinek, 1975, Acta Entomol. Bohemoslov., 72:137.
- Glischrochilus (L.) egregius monticola Jelinek Oriental
Glischrochilus egregius monticola Jelinek, 1975, Acta Entomol. Bohemoslov., 72:137.
- Glischrochilus (L.) fasciatus (Oliver) Nearctic
Nitidula fasciata Oliv., 1790, Entomol. II, No. 12, p. 7, pl. 2, fig. 12.
Ips fasciata Say, 1835, Bost. J. Nat. Hist. 1:169.
Ips 4-maculosa Melsh., 1844, Proc. Acad. Nat. Sci. Phila. 2:107.
Ips geminatus Melsh., 1844, Proc. Acad. Nat. Sci. Phila. 2:108.
Pityophagus fasciatus; Crotch, 1880, Checklist of the Coleopt. of Amer., 49.
Ips quadriguttatus Bltch., (partim), 1910, Coleopt. Ind., 649 (nec Fab., 1776, Gen. Insect. Chilonii, 214).
Glischrochilus fasciatus; Grouvelle, 1913, Coleopt. Cat. 56:187.
- Glischrochilus (L.) flavipennis (Reitter) Oriental
Cryptarcha flavipennis Reitter, 1875, Verhandl. Naturforsch. Ver. Brünn, 13:120.
Cryptarchips flavipennis; Jacobson, 1905?, Zhuki Rossii, 889.
Glischrochilus flavipennis; Jelinek, 1974, Acta Entomol. Bohemoslov., 71:189.
- Glischrochilus (L.) flavoguttatus (Reitter) Oriental
Cryptarcha flavoguttata Reitter, 1875, Verh. Naturf. Ver. Brünn. 13:120.
Glischrochilus flavoguttatus; Jelinek, 1974, Acta Entomol. Bohemoslov., 71:189.
- Glischrochilus (L.) forcipatus (Fairmaire) Palearctic/Oriental
Librodor forcipatus Fairmaire, 1889, Ann. Soc. Entomol. Fr. 6, 9:12.
Glischrochilus forcipatus; Grouvelle, 1913, Coleopt. Cat. 56:188.
- Glischrochilus (?) fuscipennis (Castelnau) Nearctic/Neotropical
Ips fuscipennis Castelnau, 1840, Hist. Nat. Coleopt. II, 14.
Glischrochilus fuscipennis; Grouvelle, 1913, Coleopt. Cat. 56:188.
- Glischrochilus (L.) grandis (Tournier) Palearctic
Ips grandis Tournier, 1872, Bull. Soc. Entomol. Suisse III, 440.
Ips latefasciatus Reitter, 1883, Rev. Mens. Entomol. Petropol. I, 41.
Glischrochilus grandis; Grouvelle, 1913, Coleopt. Cat. 56:188.
- Glischrochilus (L.) hortensis (Fourcroy) Palearctic
Dermestes hortensis Fourcroy, 1775, Entomol. Paris, 21.
Nitidula quadripunctatus Oliv., 1790, Entomol. II, 12:9, t.3, f.19.
Ips quadripunctatus Herbst, 1792, Käf. IV., 165, t. 42, f. 2.
Ips biguttulus Motsch., 1860, Schrenck's Reise II, 129, t. 8, f. 28.
Glischrochilus Olivieri Bedel, 1891, Abeille 27:153.
Glischrochilus hortensis; Bedel, 1904, Abeille 30:236.

- Glischrochilus (L.) ipsoides (Reitter) Palearctic
Cryptarcha ipsoides Reitter, 1879, Deut. Entomol. Z. 23:218.
Librodor ipsoides; Reitter, 1884, Nitid. Japans, 270.
Cryptarchips ipsoides; Reitter, 1911, Fauna Germanica, 3:37.
Glischrochilus ipsoides; Grouvelle, 1913, Coleopt. Cat. 56:188.
- Glischrochilus (?) janthinus (Reitter) Australo-Papuan
Ips janthinus Reitter, 1877, Mitt. Munch. Entomol. Ver., 1:130.
- Glischrochilus (L.) japonius superbus Jelinek Oriental
Glischrochilus japonius superbus Jelinek, 1975, Acta Entomol. Bohemoslov., 72:143.
- Glischrochilus (L.) japonius japonius (Motschulsky) Palearctic
Ips japonius Motschulsky, 1857, Etud. Entomol. 6:28.
Ips chinensis Reitter, 1873, Verh. Naturf. Ver. Brünn, 12:160.
Ips davidii Fairmaire, 1878, Ann. Soc. Entomol. Fr., 5, 8:93.
Ips nankineus Fairmaire, 1878, Ann. Soc. Entomol. Fr., 5, 8:93.
Librodor japonius; Reitter; 1884, Wien. Entomol. Ztg., 3:271.
Glischrochilus japonius; Grouvelle, 1913, Coleopt. Cat. 56:188.
Glischrochilus japonius japonius; Jelinek, 1975, Acta Entomol. Bohemoslov., 72:142-3.
- Glischrochilus (L.) klapperichi Jelinek Palearctic/Oriental
Glischrochilus klapperichi Jelinek, 1975, Acta Entomol. Bohemoslov., 72:139-140.
- Glischrochilus (L.) kuntzeni Kirjtschuk Ethiopian
Glischrochilus kuntzeni Kirejtshuk, (in press). Rev. Zool. Afric.
- Glischrochilus (L.) laetus Kirjtschuk Oriental
Glischrochilus laetus Kirejtshuk, (in press). Entomol. Rev.
- Glischrochilus (G.) lecontei Brown Nearctic
Ips cylindricus Lec., 1863, Smith Misc. Collect. 167:64 (nec Oliv., 1790.
Entomol. II, No. 18, 9.
Pityophagus cylindricus; Crotch, 1880, Checklist of the Coleopt. of Amer. 49.
Glischrochilus lecontei Brown, 1932, Can. Entomol., 64:262.
- Glischrochilus (?) minimus (Sharp)
Ips minimus Sharp, 1886, Trans. Roy. Dublin. Soc. 3(2):391
Glischrochilus minimus; Grouvelle, 1913, Coleopt. Cat., 56:188.
- Glischrochilus (L.) mirabilis Jelinek Oriental
Glischrochilus mirabilis Jelinek, 1975, Acta Entomol. Bohemoslov., 72:133-5.
- Glischrochilus (G.) moratus Brown Nearctic
Glischrochilus moratus Brown, 1932, Can. Entomol., 64:261-2.
- Glischrochilus (L.) niger (Lechanteur) Ethiopian
Africanips niger Lechanteur, 1959, Bull. Ann. Soc. Roy. Entomol. Belg. 95:107-110.
Glischrochilus niger; Kirejtshuk, (in press). Rev. Zool. Afric.

- Glischrochilus (L.) obtusus Nearctic
Ips obtusa Say, 1835, Bost. J. Nat. Hist. 1:168.
Pityophagus obtusus; Crotch, 1880, Checklist of the Coleopt. of Amer., 49.
Glischrochilus obtusus; Grouvelle, 1913, Coleopt. Cat. 56:189.
- Glischrochilus (L.) pallidus Kirejtshuk Oriental
Glischrochilus pallidus Kirejtshuk, (in press). Entomol. Rev.
- Glischrochilus (L.) pantherinus (Reitter) Palearctic
Cryptarcha pantherinus Reitter, 1879, Deut. Entomol. Z., 23:217.
Librodor pantherinus; Reitter, 1884, Wien. Entomol. Zeit. 3:270.
Cryptarchips pantherinus; Reitter, 1911, Fauna Germanica, 3:37.
Glischrochilus pantherinus; Grouvelle, 1913, Coleopt. Cat. 56:189.
- Glischrochilus (L.) parvipustulatus (Kolbe) Palearctic
Ips parvipustulatus Kolbe, 1886, Arch. F. Nat. 52(1):180, t. 11, F. 24.
Glischrochilus parvipustulatus; Grouvelle, 1913. Coleopt. Cat. 56:189.
- Glischrochilus (?) politus (M'Leay) Australo-Papuan
Ips politus M'Leay, 1871, Trans. Entomol. Soc. N. S. Wales, 2:163.
Glischrochilus politus; Grouvelle, 1913, Coleopt. Cat. 56:189.
- Glischrochilus (L.) popei Jélinek Oriental
Glischrochilus popei Jélinek, 1975, Acta Entomol. Bohemoslov., 72:138-9.
- Glischrochilus (L.) pulcher Jélinek Oriental
Glischrochilus pulcher Jélinek, 1975, Acta Entomol. Bohemoslov., 72:132-3.
- Glischrochilus (L.) quadriguttatus (F.) Palearctic
Ips quadriguttatus F., 1776, Gen. Ins., 214
Nitidula quadriguttatus; Oliv., 1790, Entomol. II, 12:10, t. 3, f. 25.
Nitidula decemguttatus; Oliv., 1790, Entomol. II, 12:10, t. 2, f. 24.
Ips quadrinotatus Scriba, 1793. Beitr. Ins.-Gesch. 3:224, t. 14, f. 5.
Glischrochilus quadriguttatus; Grouvelle, 1913, Coleopt. Cat. 56:189.
- Glischrochilus (G.) quadripunctatus (L.) Palearctic
Silpha quadripunctatus L., 1758, Syst. Nat. 10
Silpha quadripustulatus L., 1761, Fn. Svec., 2:148.
Tritoma quadripustulatus; F., 1775, Syst. Entomol., 69.
Ips quadripustulatus; F., 1776, Gen. Ins., 213.
Nitidula quadripustulatus; Oliv., 1790, Entomol. 2(12):9, T. 3, f. 22.
Ips ♂ angusticollis Motsch, 1860, Schrenk's Reise II, 129, T. 8, F. 28.
Ips ♀ biguttulus Motsch, l.c., 129.
Ips cruciatus Reitter, (non Motsch.) 1879, Deut. Entomol. Z., 23:211.
Glischrochilus quadripustulatus; Marseul, 1885, N. Repert, 131.
Glischrochilus quadripunctatus; Bedel, 1891, Abeille, 27:153.
- Glischrochilus (L.) quadrisignatus canadensis Nearctic
Glischrochilus quadrisignatus canadensis Brown, 1932, Can. Entomol. 14:259.

- Glischrochilus (L.) quadrisignatus quadrisignatus (Say) Neartic
Ips 4-signatus Say, 1835, Bost. J. Nat. Hist., 1:169
Ips similis Melsh., 1844, Proc. Acad. Nat. Sci., Phila. 2:108.
Ips bipustulatus Melsh., 1844, Proc. Acad. Nat. Sci. Phila. 2:108.
(nec. Fab., 1787, Mant. Insect. Hafniae, I, 45).
Ips bipunctatus; Melsh., 1844, Proc. Acad. Nat. Sci. Phila. 2:108 (nec. Fab.,
1787, Mant. Insect., Hafniae, I. 45),
Ips quadrisignatus sexpustulatus Reitter, 1873, Verh. Nat. Ver. Brunn 12:161.
(nec. Fab., 1792, Entomol. Syst. Hafniae I, 512).
Pityophagus 4-guttatus Crotch, (partim), 1880, Checklist of the Coleopt. of Amer.,
49 (nec. Fab., 1776, Gen. Insect. Chilonii, 214).
Ips quadriguttatus Blatch, (partim), 1910, Coleopt. Ind., 649 (nec. Fab., 1776,
Gen. Insect. Chilonii, 214).
Glischrochilus quadrisignatus quadrisignatus Brown, 1932, Can. Entomol. 64:258-9.
- Glischrochilus (L.) rubricollis Kirejtshuk, (in press). Entomol. Rev.
- Glischrochilus (L.) rufiventris (Reitter) Palearctic
Ips rufiventris Reitter, 1879, Deut. Entomol. Z., 33:219.
Cryptharchips rufiventris; Reitter, 1911, Fauna Germanica, 3:37.
Glischrochilus rufiventris; Grouvelle, 1913, Coleopt. Cat. 56:191.
- Glischrochilus (L.) sanguinolentus rubromaculatus (Reitter) Nearctic
Ips rubromaculatus Reitter, 1873, Verh. Nat. Ver. Brunn, 12:161.
Glischrochilus sanguinolentus rubromaculatus; Brown, 1932, Can. Entomol., 64:257-8.
- Glischrochilus (L.) sanguinolentus sanguinolentus (Oliv.) Nearctic
Nitidula sanguinolenta Oliv., 1790, Entomol. II, No. 12, p. 8, pl.2, fig. 14.
Ips sanguinolenta; Castelnau, 1840, Hist. Nat. Ins. 2:14.
Pityophagus sanguinolentus; Crotch, 1880, Checklist of the Coleopt. of Amer., 49.
Glischrochilus sanguinolentus; Grouvelle, 1913, Coleopt. Cat. 56:191.
- Glischrochilus (L.) siepmanni Brown Nearctic
Glischrochilus siepmanni Brown, 1932, Can. Entomol., 64:259-260.
- Glischrochilus (L.) subcylindricus (Reitter) Palearctic
Librodor subcylindricus Reitter, 1884, Nitid. Japans, 271; 1885, 101.
Glischrochilus subcylindricus; Grouvelle, 1913, Coleopt. Cat. 56:191.
- Glischrochilus (?) ultimus (Sharp) Nearctic/Neotropical
Ips ultimus Sharp, 1891, Biol. Centr.-Amer. Coleopt. II, 1:387, t. 12, f. 21.
Glischrochilus ultimus; Grouvelle, 1913, Coleopt. Cat. 56:191.
- Glischrochilus (G.) vittatus (Say) Nearctic
Ips vittata Say, 1835, Bost. J. Nat. Hist. 1:170.
Ips dejeanii Kirby, 1837, Fauna Boreali-Americana, 107, pl. II, fig. 4.
Ips sepulcralis Randall, 1838, Bos. J. Nat. Hist. 2:19.
Pityophagus vittatus; Crotch, 1880, Checklist of the Coleopt. of Amer., 49.
Glischrochilus vittatus; Grouvelle, 1913, Coleopt. Cat. 56:191.

PUBLICATIONS WITH INFORMATION ON GLISCHROCHILUS

- 001 Alford, D. V. 1976. Damage to crops by Glischrochilus hortensis (Fourcroy) (Coleoptera: Nitidulidae). Plant Pathol. 25(1):60.

Glischrochilus hortensis was reported damaging fallen tomatoes, strawberries, and sweet corn in England. (60).

- 002 Andrews, A. W. 1921. The Coleoptera of The Shiras Expedition to Whitefish Point, Chippewa County, Michigan. Pap. Mich. Acad. Sci. 293-390.

Ips fasciatus and I. sanguinolentus were collected at Whitefish Point, Chippewa County, Michigan. Description of habitat is also given (305, 308, 326, 356).

- 003 Arnett, R. H. 1960. The beetles of the United States. Cath. Univ. Press, Wash., D. C. 1112 pp.

A key is given to the genera of Nitidulidae occurring in the United States, including Glischrochilus. An illustration of the head of G. fasciatus is given. (760) Larvae of Glischrochilus sp. are reported as being predaceous on Scolytidae in Europe. (759)

- 004 Arrow, G. J. 1937. Notes on some Clavicorn Coleoptera and descriptions of a few new species and genera. Ann. Mag. Nat. Hist. 20(10):101.

The author erects a new genera, Cephalips, and places Librodor egregius in it. The insect is returned to the genus Glischrochilus by Jelínek (1975).

- 005 Austin, E. P. 1874. Catalogue of the Coleoptera of Mt. Washington, N.H., by E. P. Austin; with descriptions of new species, by J. L. LeConte, M. D. Boston Soc. Nat. Hist. 16:265-278.

The author lists Ips quadriguttatus as occurring at Mt. Washington, N. H. (268) [The specimen collected was probably G. fasciatus or G. quadrisignatus, since Glischrochilus quadriguttatus is a palearctic species.]

- 006 Bach, M. 1851. Käferfauna Deutschlands. Käferfauna für nord-und Mitteldeutschland, mit besonderer Rücksicht auf die preussischen Rheinlande. Coblenz, Holscher. 413 pp. [Beetle fauna of Germany. Beetle fauna of north and middle Germany with special regards to the Prussian Rheinland.]

Ips 4-guttata, I. 4-punctata, I. 4-pustulata are listed. (221-2)

- 007 Balachowsky, A. S. 1963. Entomologie appliquée a l'agriculture. Tome I. Coleopteres. Second volume. Masson et cie Editeurs, Paris. 1391 pp. [Entomology applied to agriculture. Part 1. Coleoptera.]

The larvae of Glischrochilus are reported to be predaceous on the larvae of Scolytidae and also species of the genera Placusa (Staphylinidae). No references are given.

- 008 Balduf, W. V. 1935. The bionomics of entomophagous Coleoptera. John S. Swift Co., Inc., New York. 220 pp.

The larvae of Glischrochilus prey upon bark beetles in Europe (164).

- 009 Barber, G. W. 1944. Observations on beetles of the family Nitidulidae in corn plants during 1944. U.S.D.A. Bureau of Entomol. and Pl. Quar., Cereal and Forage Div. R-122, Toledo, Ohio.

Predation by Glischrochilus quadrisignatus has a significant effect on populations of European corn borers, Ostrinia nubilalis.

- 010 Beaulne, J. I. 1924. Les Coléoptères du Canada. XXVIII. Famille Nitidulidae. Nat. Can. 50(11):259-262. [Coleoptera of Canada.]

A list of the species of Glischrochilus reported from Canada is given. They are: obtusus, fasciatus, quadriguttatus, sanguinolentus, confluentus, vittatus, dejeani, and cylindricus. Collection location is also given. (261-262)
[The report of G. quadriguttatus is probably in error since G. quadriguttatus is Palearctic in distribution. This species was likely G. quadrisignatus or G. fasciatus.]

- 011 Bedel, L. 1891. Observations synonymiques. L'Abeille XXVII: 153-156.
[Synonymic observations.]

Glischrochilus (Ips//Fabr.) quadripustulatus Lin., 1761 = G. quadripunctatus Lin., 1958. The author also renames Glischrochilus (Librodor) quadripunctatus || 01. as G. Olivieri. (153)

- 012 Bedel, L. 1904. Synonymics de Coléoptères Paléarctiques. L'Abeille XXX:235-236.
[Synonymics of Palearctic Coleoptera.]

Glischrochilus (Librodor) Olivieri Bed. 1891 (quadripunctatus Oliv. 1790) = G. hortensis Fourcr. 1785. (236)

- 013 Bethune, C. J. S. 1876. Insects of the northern parts of British America. From "Kirby's Fauna Boreali-Americana: Insecta." Entomol. Soc. Ont. 134 pp.

The author provides Kirby's original description of Ips dejeanii. Collection locations are given. The original description was found on page 107 of Kirby's Fauna Boreali-Americana: Insecta. (47)

- 014 Biström, O. 1978. A replacement name for Ipidia quadrinotata (Coleoptera, Nitidulidae). Notulae Entomol. 58(3):88.

In 1977 the author replaced the name Ipidia quadrimaculata (Quens. 1790) with Ipidia quadrinotata. Because Ipidia quadrinotata, described by Fabricius 1798 as Ips quadrinotata, is preoccupied by Ips quadrinotatus Scriba 1793 (= Glischrochilus quadriguttatus (F. 1777)), the author introduces the name Ipidia quadriplagiata as a new name for Ipidia quadrimaculata.

- 015 Blackman, N. W. 1919. Notes on forest insects. I. On two bark-beetles attacking the trunks of white pine trees. Psyche XXVI (4):85-96.

Glischrochilus sanguinolentus is reported as occurring in the feeding burrow of young adult Hylurgops pinifex. (96)

- 016 Blackwelder, R. E. 1957. Checklist of the coleopterous insects of Mexico, Central America, the West Indies, and South America. Part 3. Smithsonian Inst. and U. S. Nat. Mus. Bull. 185. 1492 pp.

Species of Glischrochilus collected from Mexico, Central America, the West Indies, and South America are: clarkana, fuscipennis, and ultimus. (418).

- 017 Blackwelder, R. E. and R. H. Arnett. 1977. Checklist of the beetles of Canada, United States, Mexico, Central America, and the West Indies. Pt. VII. Nitidulidae. North American Beetle Fauna Project. World Digest Publications, Kinderhook, New York. R86.1-R86.18.

The following North American species of Glischrochilus are listed: obtusus, fasciatus, sanguinolentus, confluentus, vittatus, quadrisignatus, siepmanni, moratus, lecontei, fuscipennis, and ultimus. G. bipustulatus, G. quadriguttatus, G. quadrisignata, G. sexpustulatus, and G. geminatus are listed as synonyms for, and G. quadrimaculosus a subspecies of G. fasciatus. G. rubromaculatus is given as a subspecies of G. sanguinolentus. G. dejeani and G. sepulchralis are listed as synonyms of G. vittatus. G. similis and G. bipustulatus are listed as synonyms for, and G. canadensis a subspecies of G. quadrisignatus. G. cylindricus is listed as synonym of G. lecontei. North American distribution records are provided. (R86.17-R86.18).

- 018 Blackwelder, R. E. and R. M. Blackwelder. 1948. Fifth supplement to the Leng Catalogue of Coleoptera of America, North of Mexico. J. D. Sherman, Jr., Mt. Vernon, N. Y. 87 pp.

Glischrochilus obtusus, G. sanguinolentus sanguinolentus, G. s. rubromaculatus, G. fasciatus, G. siepmanni, G. quadrisignatus quadrisignatus, G. q. canadensis, G. vittatus, G. confluentus, G. moratus, and G. lecontei are listed. G. quadrimaculosa and G. geminatus are given as synonyms of G. fasciatus. G. similis, G. bipustulatus, G. bipunctatus, and G. sexpustulatus are given as synonyms of G. q. quadrisignatus. G. cylindricus is given as a synonym of G. lecontei. Distribution records are provided. (25)

- 019 Bland, R. B. and H. E. Jaques. 1978. How to know the insects. Wm. C. Brown Co., Dubuque, Iowa. 409 pp.

Description and distribution is provided for Glischrochilus fasciatus, G. sanguinolentus, and G. quadrisignatus. (212-213) An illustration of G. fasciatus is given. (212)

- 020 Blatchley, W. S. 1910. An illustrated descriptive catalogue of the Coleoptera or beetles (exclusive of the Rhynchophora) known to occur in Indiana. Indianapolis: The Nature Publishing Co. 698 pp.

A key and brief description is given for the species of Ips known to occur in Indiana. (649-650)

- 021 Börner, V. A. 1949. Insekten. Pages 136-420 in P. Brohmer, ed. Fauna von Deutschland. Quelle and Meyer, Heidelberg.

A key to the genera of German insects included Librodor. (254)

- 022 Borror, D. J., and D. M. DeLong. 1954. An introduction to the study of insects. Holt, Rinhart, and Winston, New York. 819 pp.

The authors provide an illustration of Glischrochilus quadrisignatus. (298)

- 023 Borror, D. J. and R. E. White. 1970. A field guide to the insects of America North of Mexico. Houghton Mifflin Co., Boston. 404 pp.

A description and illustration of Glischrochilus quadsignatus is given. (Pl. 6)

- 024 Böving, A. G. and F. C. Craighead. 1931. An illustrated synopsis of the principal larval forms of the order of Coleoptera. Entomol. Amer., 9(2):1-351.

Illustrations of the head, spiracle, mandible, leg, prothorax and mesothorax, and a lateral view of the larva of Glischrochilus obtusus is given. (156-157).

- 025 Böving, A. G. and J. G. Roxen, Jr. 1962. Anatomical and systematic study of the mature larvae of the Nitidulidae (Coleoptera). Entomol. Medd. 31:265-299.

A key and illustrations of certain anatomical structures are provided for the mature larvae of Glischrochilus obtusus, G. japonius, G. vittatus, G. fasciatus, and G. quadrisignatus. (294-295) Collection data is also given for the above species. (298)

- 026 Bradley, J. C. 1930. A manual of the genera of beetles of America, North of Mexico. Daw, Illston and Co., Ithaca, N. Y. 360 pp.

A key is given to the genera of the Nitidulidae known to occur in North America including Glischrochilus. (148)

- 027 Brimley, C. S. 1938. The insects of North Carolina. North Carolina Dep. of Agr., Raleigh, N. C. 560 pp.

Species of Glischrochilus collected from North Carolina are: fasciatus, sanguinolentus, confluentus, and quadrisignatus. Location and month of collection are given. (178) G. obtusa was collected from North Carolina. Location of collection is given. (510)

- 028 Broun, (initials unknown). 1893. Manual of the New Zealand Coleoptera. V.

Original not seen. Believed to contain information on Glischrochilus minimus on page 1078.

- 029 Brown, W. J. 1932. The North American species of Glischrochilus (Coleop).
Can. Entomol. 64:255-262.

A key is given to the North American species of Glischrochilus including G. sanguinolentus sanguinolentus, G. sanguinolentus rubromaculatus, G. obtusus, G. fasciatus, G. quadrisignatus quadrisignatus, G. vittatus, G. confluentus. (255-6) G. siepmanni and G. moratus, are described as new species. (259-262) G. quadrisignatus canadensis is described as a new subspecies. (259) The author renames Glischrochilus cylindricus (Lec.) as Glischrochilus lecontei. (262) Descriptions and collection records are provided for all of the above species.

- 030 Brues, C. T. and A. L. Melander. 1932. Classification of insects. A key to the known families of insects and other terrestrial arthropods. Bull. Mus. Comp. Zool. LXXIII. 672 pp.

An illustration of Glischrochilus sp. is given. (418)

- 031 Brues, C. T., A. L. Melander, and F. M. Carpenter. 1954. Classification of insects. A key to the living and extinct families of insects, and to the living families of other terrestrial arthropods. Bull. Mus. Comp. Zool. 108. 917 pp.

An illustration of Glischrochilus sp. is given. (553)

- 032 Byers, R. A. and G. A. Jung. 1979. Insect populations on forage grasses: effect of nitrogen fertilizer and insecticides. Environ. Entomol. 8(1):11-18.

Glischrochilus quadrisignatus was collected from forage grasses by sweep net. (12)

- 033 CDA. 1940. Can. Insect Pest Rev. 18(4):268^{2/}.

Glischrochilus fasciatus occurs in decaying fruit and fermenting sap from newly cut tree stumps.

- 034 CDA. 1947. Can. Insect Pest Rev. 25(5):256.

Glischrochilus sp. were found in cracks in ripening tomatoes and on the silks of corn ears in Ontario.

- 035 CDA. 1948. Can. Insect Pest Rev. 26(1):60, 64, 60, 73; (5):214.

Glischrochilus sp. entered houses in southwestern Ontario (60, 73), were found in tunnels made in corn by the European corn borer (64), and were found in large numbers in cracks in tomatoes (70) in 1947. G. fasciatus were found on tomatoes, corn, and raspberries. They were frequently present in large numbers greatly adding to damage caused by other pests. (214)

^{2/} Canadian Department of Agriculture, Insect Pest Review, began with Vol. 1 in 1923. It presents data governing the seasonal appearance of insect pests, the effects of winter, degrees of parasitism, notes on distribution, and abundance of insect pests. In 1968 this publication became known as The Agricultural Insect Pest Review. It has been published by The Canada Department of Agriculture, Research Branch - Scientific Information Section, Ottawa, Ontario from 1923 to present.

036 CDA. 1949. Can. Insect Pest Rev. 27(1):62.

Glischrochilus fasciatus were present in large numbers on sweet corn in July in Ontario. They were also found feeding on raspberries and tomatoes.

037 CDA. 1950. Can. Insect Pest Rev. 28(1):49; (5):194; (9):281.

Few reports of Glischrochilus fasciatus were received in 1949. (49) G. quadrisignatus was reported to be infesting dwellings near a fruit pectin plant in Cobourg, Ontario. (194, 281)

038 CDA. 1953. Can. Insect Pest Rev. 31(7):286, 299.

Glischrochilus quadrisignatus fed on corn (286) and raspberries (299) near Delaware, Ontario.

039 CDA. 1956. Can. Insect Pest Rev. 34(6):252; (7):277; (9):308.

Large populations of Glischrochilus fasciatus were reported in northcentral and southwestern Ontario and caused concern to raspberry, corn, and tomato growers. (252, 308) Glischrochilus sp. were more numerous this year. They infested corn, raspberries, and tomatoes near Chatham, Ontario. (277)

040 CDA. 1957. Can. Insect Pest Rev. 35(1):57, (3):174, 189; (6):253; 9(303).

Glischrochilus fasciatus were present in raspberries before and after picking, injured corn, cracked tomatoes, and other fruits and vegetables. (57) Ten to twenty percent of onion sets in a garden near Highgate, Ontario were injured by G. quadrisignatus. (174) This beetle caused annoyance by entering homes in Chatham, Ontario (189) and was unusually injurious to corn, tomatoes, and raspberries in southwestern Ontario. (303) Glischrochilus sp. were found in southwestern Ontario feeding on injured corn ears. (253)

041 CDA. 1958. Can. Insect Pest Rev. 36(1):57, 64, 69; (1):319.

Glischrochilus quadrisignatus were extremely plentiful in Oxford Co. and other parts of Ontario. They attacked sound and overripe raspberries making it unprofitable to pick the crop. The beetle also attacked both injured and uninjured sweet corn. Large numbers congregated on screens and became a household pest in late May. (57, 69, 319) Glischrochilus sp. were plentiful on corn, tomatoes, and raspberries in southwestern Ontario. (64)

042 CDA. 1959. Can. Insect Pest Rev. 37(1):65; (9):286.

Glischrochilus sp. were plentiful on corn and tomatoes. They frequently caused damage to sweet corn by destroying kernels at the tips of ears. (65) G. quadrisignatus caused severe damage to ripening raspberries in Elgin and Lambton Counties, Ontario. Some growers considered discontinuing production because of these pests. (286)

043 CDA. 1960. Can. Insect Pest Rev. 38:51, 53, 253, 301.

Original not seen. Contains information on Glischrochilus sp. (53) and G. quadrisignatus. (51, 253, 301)

044 CDA. 1961. Can. Insect Pest Rev. 39:52, 60, 339.

Original not seen. Contains information on Glischrochilus sp. (52, 339) and G. quadrisignatus. (60)

045 CDA. 1962. Can. Insect Pest Rev. 40:166, 228, 240.

Original not seen. Contains information on Glischrochilus sp. (228) and G. quadrisignatus. (166, 240)

046 CDA. 1964. Can. Insect Pest Rev. 42(8):147; (9):193.

Glischrochilus spp. were plentiful in areas of southwestern Ontario where bird damage to corn was severe. (147, 193)

047 CDA. 1965. Can. Insect Pest Rev. 43(8):217.

Glischrochilus spp. were plentiful in areas of southwestern Ontario where bird damage to corn was severe.

048 CDA. 1966. Can. Insect Pest Rev. 44:9, 12.

Glischrochilus quadrisignatus were very prevalent in sweet corn in southwestern Ontario and southwestern Quebec infesting the tips of damaged ears. In heavily infested fields they appeared to also be primary invaders. (9) An outbreak of these beetles in southwestern Ontario created problems in processing tomatoes. (12)

049 CDA. 1967. Can. Insect Pest Rev. 45:7, 10, 13.

Glischrochilus quadrisignatus were less severe in corn in southwestern Ontario than in 1966. (7) They continued to infest raspberries in southwestern Ontario. (10) The beetles were probably the most important pest of vegetables in Ontario. Infestations in tomatoes were large enough in some fields that a number of loads were rejected by processors. (13)

050 CDA. 1968. Can. Agr. Insect Pest Rev. 46:9, 20.

Glischrochilus quadrisignatus were numerous in late processing corn (9) and contaminated ripe raspberry fruits (120) in southwestern Ontario.

051 CDA. 1969. Can. Agr. Insect Pest Rev. 47:11, 18, 25-6.

Glischrochilus quadrisignatus were plentiful on corn in Kent Co. (11), on tomatoes (18), and were observed feeding on McIntosh and Spy apples (25-6) in Ontario.

052 CDA. 1970. Can. Agr. Insect Pest Rev. 48:11, 20, 30.

Glischrochilus quadrisignatus infested the tips of corn ears damaged by borers in southwestern Quebec. (11) Severe infestations of this beetle occurred in and around tomato fields in southwestern Ontario where they caused damage to tomatoes after harvest. (20) The beetle was also reported as an important problem in ripe raspberries in western Ontario. Infestations of this pest have increased dramatically in eastern Ontario in recent years. (30)

053 CDA. 1971. Can. Agr. Insect Pest Rev. 49:21, 31.

Populations of G. quadrisignatus were high on tomato fruits in Kent Co., Ontario. (21) The beetles infested ripe and overripe fruits and vegetables throughout Ontario being a serious nuisance in raspberries in Ontario and southwestern Quebec. (31)

054 CDA. 1972. Can. Agr. Insect Pest Rev. 50:11, 20, 29.

Glischrochilus quadrisignatus were plentiful on corn, raspberries, and tomatoes in southwestern Ontario. (11) No major reports of major infestations in processing tomatoes were received from canning factories in Kent Co., Ontario. (20) The beetle was a serious nuisance on ripe raspberries in southwestern and eastern Ontario and in Quebec. (29)

055 CDA. 1973. Can. Agr. Insect Pest Rev. 51:22, 37-8.

Glischrochilus quadrisignatus were of importance in raspberries in New Brunswick. Greatest infestations were found close to corn fields. (22) Populations of this beetle were high in Kent Co., Ontario. However, because of the bulk wagon system of delivery adopted by canning companies, the number of damaged tomatoes has been reduced. (37-8)

056 CDA. 1975. Can. Agr. Insect Pest Rev. 53:17, 23-4.

Glischrochilus quadrisignatus was not a problem in the production of raspberries in Quebec. (17) G. quadrisignatus were trapped by the thousands in apple orchards in Ontario. The numbers trapped were 100% higher than in 1974. An average of three beetles were found in the axils of corn leaves. (23-4)

057 CDA. 1977. Can. Agr. Insect Pest Rev. 55:23, 45.

Glischrochilus quadrisignatus was reported from raspberries in Quebec (23) and in canned tomatoes from Saskatchewan. (45)

058 Carlson, R. E. and H. C. Chiang. 1973. Reduction of an Ostrinia nubilalis population by predatory insects attracted by sucrose sprays. Entomophaga 18(2):205-211.

Sprays of a sucrose or molasses solution on corn plants increased the population of picnic beetles, G. quadrisignatus, on the plants. A high beetle population was highly correlated with a low corn borer larva/tunnel ratio, suggesting that the beetles reduced the number of corn borer larvae after they entered the stalk.

- 059 Castelnau, M. L. de. 1840. Histoire naturelle des insectes, Coléoptères. II. Terzuolo, Paris. 564 pp. [Natural history of the insects.]

Brief descriptions and distributions are given for Ips quadripunctatus, I. fuscipennis, I. quadriguttatus, I. quadripustulatus, and I. sanguinolenta. (13-14) Ips fuscipennis is described as a new species (14).

- 060 Caulfield, F. B. 1888. Notes on Ips. Can. Entomol. 20(10):188-189.

Collection records and habits of Ips fasciatus and I. quadrisignatus are given.

- 061 Chagnon, G. (No date given). Contribution à l'étude des Coleopteres de la province de Quebec. Dep. Biol., Univ. Montréal, Montréal, Can. 385 pp. [Contributions to the study of the Coleoptera of the province of Quebec.]

Descriptions are provided for Glischrochilus sanguinolentus, G. confluentus, G. fasciatus, and G. quadrisignatus. G. vittatus and G. siepmanni are sometimes encountered with the above species. (164)

- 062 Chamberlin, W. J. 1918. Bark beetles infesting the douglas fir. Oregon Agr. Exp. Sta. Bull. 147.

Glischrochilus fasciatus is predaceous on the larvae of Trypandodendron lineatus in Oregon.

- 063 Chamberlin, W. J. 1939. The bark and timber beetles of North America, North of Mexico. OSC Coop. Ass., Corvallis, Oregon. 513 pp.

Glischrochilus vittatus is a facultative predator of Dendroctonus menticolae. (57)

- 064 Chatterjee, S. N. 1924. Catalogue of Indian insects. Part 5. Nitidulidae. Government of India., Calcutta, India. 40 pp.

Glischrochilus egregius and G. japonius are listed. Geographical distribution is given. (32)

- 065 Chu, H. F. 1949. How to know the immature insects. Wm. C. Brown Co., Dubuque, Iowa. 234 pp.

An illustration of the larva of Glischrochilus obtusus is given. (107)

- 066 Comstock, J. H. 1940. An introduction to entomology. Comstock Publ. Co., Inc., Ithaca, N. Y. 1064 pp.

An illustration of Glischrochilus fasciatus is given. (508)

- 067 Connell, W. A. 1956. Nitidulidae of Delaware. Del. Exp. Sta. Bull. 318. 67 pp.

A key is given to the adult Nitidulidae and some of the larvae known to occur in Delaware. (56-61) Collection records are given for G. confluentus, G. fascitus, G. obtusus, G. sanguinolentus, and G. quadrisignatus. (64-66)

- 068 Connell, W. A. 1975. Hosts of Carpophilus dimidiatus. J. Econ. Entomol. 68(2):279-280.

Glischrochilus sp. was reported to infest corn in Delaware.

- 069 Cox, H. E. 1874. A handbook of the Coleoptera or beetles of Great Britain and Ireland. Vol. 1. O. E. Janson and Son, London. 522 pp.

A key and brief descriptions are provided for Ips quadriguttatus, I. quadripunctata, I. quadripustulata. (446)

- 070 Craighead, F. C. 1950. Insect enemies of eastern forests. USDA Misc. Pub. No. 657. 679 pp.

Glischrochilus fasciatus, G. sanguinolentus, and G. confluentus are common between the bark and wood of dead trees. The larvae of G. fasciatus are commonly associated with locust borer larvae. (208-209)

- 071 Crotch, G. R. 1880. Checklist of the Coleoptera of America, North of Mexico. G. A. Bates, Natur. Bur., Salem, Mass. 136 pp.

The author lists Pityophagus 4-guttatus, P. fasciatus, P. obtusus, P. sanguinolentus, P. cylindricus, P. confluens, P. vittatus, and P. Dejeani (49). [P. 4-guttatus is probably in error since this species is known only from palearctic regions. This species is probably Glischrochilus (=Ips) (=Pityophagus) quadrisignatus.]

- 072 Crowson, R. A. 1938. The metendosternite in Coleoptera: A comparative study. Trans. Roy. Entomol. Soc. London 87:397-416.

The author discusses the endosternites of several species of Nitidulidae including Glischrochilus quadripunctatus. (401)

- 073 Curl, E. A. 1955. Natural availability of oak wilt inocula. Bull. Ill. Natur. Hist. Surv. Div. 26(3):272-323.

Glischrochilus obtusus and G. sanguinolentus were reported to feed on oak wilt mats. (297, 305-309)

- 074 Daugherty, D. M. and C. H. Brett. 1966. Nitidulidae associated with sweet corn in North Carolina and influences affecting their damage to this crop. North Carolina Agr. Exp. Sta. Bull. 171. 40 pp.

Glischrochilus fasciatus and G. q. quadrisignatus were collected from banana bait stations and from sweet corn in North Carolina. (8)

- 075 Davidson, R. H. and W. F. Lyon. 1979. Insect pests of farm, garden, and orchard. John Wiley & Sons, New York. 596 pp.

A brief description of the habits and life history of Glischrochilus quadrisignatus is given. (166-167)

- 076 DeJean, C.P.F.M.A. 1937. Catalogue des Coléoptères de la collection de M. le Comte DeJean. Méquignon Marvis. Paris. 503 pp. [Catalogue of the Coleoptera in the collection of M. le Comte DeJean.]

Ips sanguinolenta, I. quadrisignata, I. quadripustulata, I. quadripunctata, and I. quadriguttata are listed. Geographic distribution is provided. (134)

- 077 DeLeon, D. 1934. An annotated list of the parasites, predators, and other associated fauna of the mountain pine beetle in western white pine and lodgepole pine. Can. Entomol. 66(3):51-61.

Glischrochilus vittatus is reported as a facultative predator of the mountain pine beetle (Dendroctonus monticolae Hopk.) in western United States.

- 078 Deyrolle, MM. H. and L. Fairmaire. 1878. Descriptions de Coléoptères recueillis par M. l'abbé David dans la Chine centrale. Ann. Soc. Entomol. France. 8:87-140. [Descriptions of the Coleoptera collected by M. l'abbé David in central China.]

Ips davidis and Ips nankineus are described as new species by Fairmaire. (93)

- 079 Dillon, E. S. and L. S. Dillon. 1964. A manual of common beetles of eastern North America. Row, Peterson, and Co., Evanston, Ill. 884 pp.

A key is given for the genera of Nitidulidae including Glischrochilus. (396) Description and collection habitat are given for G. sanguinolentus, G. quadrisignatus, and G. fasciatus. (397) An illustration of the prosternum of Glischrochilus sp is provided. (397)

- 080 Doane, R. W., E. C. Van Dyke, W. J. Chamberlin, and H. E. Burke. 1936. Forest insects. McGraw-Hill Book Co., Inc., New York. 463 pp.

Distribution of Glischrochilus fasciatus, G. vittatus, and G. cylindricus in western North America is given. (204)

- 081 Dodge, H. R. 1938. The bark beetles of Minnesota (Coleoptera: Scolytidae). Univ. of Minn., Agr. Exp. Sta. Tech. Bull. 132. 60 pp.

Glischrochilus siepmanni is attracted by the sap which exudes from the burrows of Trypophloeus nitidus Swaine.

- 082 Dorsey, C. K., F. F. Jewell, J. G. Leach, and R. P. True. 1953. Experimental transmission of oak wilt by four species of Nitidulidae. USDA Plant Dis. Rep. 37:419-420.

Glischrochilus fasciatus, G. sanguinolentus, and G. confluentus were incriminated as vectors of oak wilt disease.

- 083 Dorsey, C. K., and J. G. Leach. 1956. The bionomics of certain insects associated with oak wilt with particular reference to the Nitidulidae. J. Econ. Entomol. 49:219-230.

Glischrochilus quadrisignatus, G. fasciatus, G. sanguinolentus, and G. confluentus were collected from oak wilt-infected trees in West Virginia. G. fasciatus and G. sanguinolentus were reared from oak wilt-infected trees. Data are presented on the trapping of the above species with various baits.

- 084 Duftschmid, C. 1825. Fauna Austriae. Order beschreibung der österreichischen insecten, für angehende freunde der entomologie. Linz u. Leipzig, Akad. Buchhandl. 8. 289 pp. [Fauna of Austria. Or descriptions of Austrian insects for beginning students of entomology.]

A brief description and distribution of Ips quadripustulata, I. quadripunctata, I. quadrinatata, and I. quadriguttata is given. (142-143)

- 085 Dury, C. 1902. A revised list of the Coleoptera observed near Cincinnati, Ohio. J. Cincinnati Soc. Natur. Hist. 20(3):1-90.

Ips fasciatus, I. confluentus, and I. sanguinolentus are listed. (30)

- 086 Edwards, J. G. 1949. Coleoptera or beetles east of the Great Plains. Edwards Brothers, Inc., Ann Arbor, Mich. 181 pp.

Glischrochilus spp. are reported as being predaceous on Scolytidae in Europe. No reference is given. (124)

- 087 Elton, E. T. G., H. F. H. Blankwaardt, H. C. Burger, W. F. Steemers, and L. G. Tichelman. 1964. Insect communities in barked and unbarked pine stumps, with special reference to the large pine weevil (Hylabius abietis L., Col., Curculionidae). Z. Angew. Entomol. 55:1-54.

Glischrochilus quadripunctatus was collected from pine stumps in the Netherlands. (42)

- 088 Erichson, W. F. 1843. Versuch einer systematischen eintheilung der nitidularien. Z. Entomol., 4:225-361. [An attempt at the systematic classification of the nitidulids.]

The author lists the following species of the genus Ips: quadriguttatus, quadrisignatus, quadripunctatus, fasciatus, obtusus, sanguinolentus, quadripustulatus. Distribution is given. (358-9)

- 089 Erichson, W. F. 1848. Naturgeschichte der insecten Deutschlands. Coleoptera. Dritter Band. Buchhandlung. Berlin. 968 pp. [Natural history of the German Insects. Coleoptera. Volume Three.]

Descriptions of the genus Ips and the species I. quadriguttata, I. quadripunctata, and I. quadripustulata are given. (223-5)

- 090 Evans, J. D. 1895. The insect fauna of the Sudbury District, Ontario. Can. Entomol. 27:141-146, 173-175.

Ips fasciatus, I. sanguinolentus, and I. vittatus were collected in Ontario. (145)

- 091 Everly, R. T. 1938. Spiders and insects found associated with sweet corn with notes on the food and habits of some species. Ohio J. Sci. 38:136-148.

Glischrochilus quadrisignatus was collected from corn in Ohio. One specimen was observed feeding upon the larva of the European corn borer. (147)

- 092 Everts, J. E. 1903. Coleoptera Neerlandica. 'S-Gravenhage. 677 pp. [Dutch Coleoptera.]

A key to the Dutch species of Ips included I. quadripustulatus, I. quadripunctatus and I. quadriguttatus. (492-3)

- 093 Everts, E. J. G., A. W. M. van Hasselt, and F. M. van Der Wulp. 1881. Bijdrage tot de kennis der Nitidularien. Tijdschr. Entomol. 24:9-60. [Contribution to the knowledge of the Nitidulidae.]

Descriptions, distributions, and a key are provided for Ips quadriguttatus, I. quadripunctatus, and I. quadripustulatus. (56-7)

- 094 Fabricius, J. C. 1775. Systema Entomologiae. Flensburgi et Lipsiae. 832 pp. [Systems of Entomology.]

The author provides a description and habitat information for Tritoma quadripustulatus. (69)

- 095 Fabricius, J. C. 1776. Genera Insectorum. Chilonii. 310 pp. [Insect genera.]

Ips 4-guttata is described as a new species. A description of I. 4-pustulatus is provided. (213-4)

- 096 Fabricius, J. C. 1781. Species Insectorum. Hambvrgi et Kilonii. 494 pp. [Insect species.]

Description and habitat information are provided for Ips 4-pustulata and I. 4-guttata.

- 097 Fabricius, J. C. 1787. Mantissa Insectorum. Hafniae. 382 pp. [Addition to insect checklist.]

A description of Ips 4-pustulata is provided. (45)

- 098 Fabricius, J. C. 1792. Entomologia Systematica. Hafniae. 538 pp. [Systematic Entomology.]

Description and distribution is provided for Ips 4-pustulata and I. 4-guttata. (512-3)

- 099 Fabricius, J. C. 1801. Systema eleutheratorum. Tomvs. II. Kiliae. 687 pp. [Systematic phyllogeny.]

Descriptions and distribution information is provided for Ips 4-pustulata and I. 4-guttata. (579-80)

- 100 Fairmaire, M. L. 1889. Coléoptères de l'intérieur de la Chine. Ann. Soc. Entomol. Fr. (6) IX:1-84.

Librodor forcipatus is described as a new species. Ips quadripustulatus was collected in China. Collection locations are given. (12)

- 101 Fall, H. C. 1901. List of the Coleoptera of Southern California, with notes on habits and distribution and descriptions of new species. Occas. Pap. Calif. Acad. Sci. 8. 282 pp.

Ips vittatus and I. cylindricus are reported from northern California. (99)

- 102 Fattig, P. W. 1937. The Coleoptera or beetles of Georgia (V). Entomol. News 48(9):250-255.

Glischrochilus obtusus, G. sanguinolentus, and G. confluentus were collected in Georgia. The author reports F. fasciatus as occurring in Georgia. [This is believed to be a misprint and should read G. fasciatus.] Localities are given. (253)

- 103 Fauconnet, L. 1892. Faune Analytique. Des Coléoptères de France. Bligny-Cottot, Autun. 528 pp. [Fauna Analytical. The Coleoptera of France.]

A key to the genus Ips includes I. 4-guttata, I. 4-punctata, and I. 4-pustulata. (104)

- 104 Foott, W. H. 1974. Sap beetles on raspberries, tomatoes, and corn. Min. Agr. Food Factsheet. Agdex 675. 1 pp.

Glischrochilus quadrisignatus is a pest of raspberries, tomatoes, and corn. Methods of control are suggested.

- 105 Foott, W. H. 1976a. Effect of fragmentation of ears of field corn on reproduction by Glischrochilus quadrisignatus (Say) (Coleoptera: Nitidulidae). Proc. Entomol. Soc. Ont. 106:47-58.

To significantly reduce oviposition of Glischrochilus quadrisignatus on ears of corn remaining in fields after harvest, it was necessary to break ears into quarters or less. The results offer little hope that populations can be reduced by manipulation of ears of corn remaining in the fields.

- 106 Foott, W. H. 1976b. Use of fluorescent powders to monitor flight activities of adult Glischrochilus quadrisignatus (Coleoptera: Nitidulidae). Can. Entomol. 108:1041-1044.

Fluorescent powders provided an effective method for marking and monitoring flight activities of adult Glischrochilus quadrisignatus, a pest of processing tomatoes. The author concludes that beetles are probably attracted to damaged tomatoes from a wide area.

- 107 Foott, W. H. and H. E. Hybsky. 1976. Capture of Glischrochilus quadrisignatus (Coleoptera: Nitidulidae) in bait traps, 1970-1974. Can. Entomol. 108(8):837-839.

Numbers of Glischrochilus quadrisignatus trapped over a five year period using ripe banana as a bait are given. The author suggests the use of traps from early ripening to harvest as an effective method for protecting damaged tomatoes from beetle infestations.

- 108 Foott, W. H., and P. R. Timmin. 1971. Importance of field corn as a reproductive site for Glischrochilus quadrisignatus (Say) (Coleoptera: Nitidulidae). Proc. Entomol. Soc. Ont. 101:73-5.

Ears of field corn missed by harvesting machinery are the principal reproductive sites for Glischrochilus quadrisignatus in southwestern Ontario.

- 109 Foott, W. H. and P. R. Timmin. 1977. Biology of Glischrochilus quadrisignatus (Coleoptera: Nitidulidae) in southwestern Ontario. Proc. Entomol. Soc. Ont. 108:37-44.

Information is provided on the dates of occurrence of the various stages of Glischrochilus quadrisignatus. (37-41) Results of attractancy tests are provided. (41) Evidence is presented which substantiate claims that G. quadrisignatus has only one generation per year. (42-44)

- 110 Foott, W. H. and P. R. Timmins. 1979. The rearing and biology of Glischrochilus quadrisignatus (Coleoptera: Nitidulidae) in the laboratory. Can. Entomol. 111:1337-1344.

Methods for rearing Glischrochilus quadrisignatus are given. (1337) The authors present data on the fecundity, longevity, and development of G. quadrisignatus.

- 111 Forbes, S. A. 1920. The banded Ips. Eighteenth report of the state entomologist on the noxious and beneficial insects of the state of Illinois. 1891-1892. pp. 20-24.

Adults of Ips fasciatus were reported to feed on corn seed, corn stalks, corn ears, apples, pears, raspberries, blackberries, squash, cabbage, tree sap, blossoms of composite plants, the pollen and anthers of corn, bread, and other vegetable substances. (20-22) Descriptions and illustrations of the larvae, pupae, and adults are given. (22-24) (Pl, V., Fig. 3-5)

- 112 Forbes, W. T. M. 1922. The wing venation of Coleoptera. Ann. Entomol. Soc. Amer. 15:328-351.

An illustration of the wing venation of Glischrochilus fasciatus is provided (Pl. 34; fig. 54)

- 113 Fourcroy, A. F. 1775. Entomologia Parisiensis; Sive catalogus insectorum quae in agro Parisiensi reperiuntur. Pars prima. Paris. 231 pp. [Parisian Entomology, Catalog of the insects found in agricultural areas of Paris. Part I.]

Dermestis hortensis is described as a new species. Habitat information is given. (21)

- 114 Fowler, C. 1889. The Coleoptera of the British Islands, III. L. Reeve and Co., London. 399 pps. 98 pl.

Description, distribution, and habitats are given for Ips quadrigutta, I. quadripunctata, and I. quadripustulata. A key to the above species is provided. (261-262)

- 115 Frisch, J. L. 1730. Beschreibung von allerly insecten in Deutsch-land. IX. 38 pp. [Descriptions of all kinds of insects of Germany.]

The author describes the biology of Mycetophagus 4-maculatus. (36) [This insect will later be described as Silpha quadripunctatus by Linnaeus (1758).]

- 116 Frost, S. W. 1942. General Entomology. McGraw-Hill Book Co., Inc., New York. 524 pp.

Glischrochilus spp. may gather upon sap oozing from a wound on a tree. (232)

- 117 Frost, S. W. 1959. Insect life and insect natural history. Dover Publ., Inc., New York. 526 pp.

Numerous adult Glischrochilus spp. may gather upon sap oozing from a wound on a tree. (232)

- 118 Frost, S. W. and H. Dietrick. 1929. Coleoptera taken from bait traps. Ann. Entomol. Soc. Amer. 22(3):422-432.

Glischrochilus fasciatus, G. sanguinolentus, and G. obtusus were taken from molasses bait traps in Pennsylvania. (434)

- 119 Gahan, C. J. 1900. Stridulating organs in Coleoptera. Trans. Entomol. Soc. London. 1900(3):433-452.

The genus Ips and allied forms of the family Nitidulidae possess a stridulating file on the crown of the head. (435)

- 120 Ganglbauer, L. 1899. Die Käfer von Mitteleuropa. Dritter Band. Carl Gerold's Sohn. 1048 pp. [The beetles of middle Europe. Vol. 3.]

The author provides a detailed description of the genus Glischrochilus. The larva of G. quadripunctatus is also described. A key and descriptions of the subgenera Librodor and Glischrochilus is provided along with descriptions of G. l. quadripunctatus, G. l. quadriguttatus, and G. g. quadripustulatus. Distribution is also given. (551-555)

- 121 Gemminger, Dr. and de Harold, B. 1868. Catalogus Coleopterorum. III. Nitidulidae. E. H. Gummi, Monachii, 802-836.

The following species of Ips are listed: angusticollis, biguttulus, bipustulatus, confluentus, cruciatus, cylindricus, dejeani, fasciatus, fuscipennis, geminatus, japonius, obtusus, quadriguttatus, quadrimaculatus, quadripunctatus, quadripustulatus, quadrisignatus, sanguinolentus, and vittatus. Distribution is provided. (835-6)

- 122 Gertz, R. F. 1968. Stelidota geminata (Coleoptera: Nitidulidae): Biology and means of control on strawberries in Michigan. Mich. State Univ., Ph.D. dissertation. 72 pp.
- Glischrochilus sp. were collected in traps baited with bran molasses and grape juice mixtures in woodlots, strawberry fields, and pear orchards in Berrien Co., Michigan. (30) G. fasciatus were reported to be highly attracted to Duplicolor automobile touch-up paint. (47)
- 123 Gibson, W. W. and J. L. Carrillo - S. 1959. Lista de insectos en la coleccion entomologica de oficina de estudios especiales, S.A.G. Secretaria De Agricultura y Ganaderia, Oficina de Estudios Especiales, Mexico. Folleto Miscelaneo No. 9. 254 pp. [List of the insects in the entomological collection of the office of special studies.]
- Glischrochilus fasciatus, G. sanguinolentus, and G. quadrisignatus are listed from Massachusetts. (92)
- 124 Goble, H. W. 1965. Insects attacking agricultural crops and ornamental plants in Ontario in 1965. Proc. Entomol. Soc. Ont. 96:5-6.
- Glischrochilus quadrisignatus was reported as infesting raspberries and tomatoes in Ontario. (5)
- 125 Goble, H. W. 1966. Insects of the season 1966 related to fruit, vegetables, and ornamentals. Proc. Entomol. Soc. Ont. 87:6-7.
- Glischrochilus quadrisignatus was reported as infesting raspberries, tomatoes, and corn in Ontario. (7)
- 126 Grouvelle, A. 1892. Viaggio di Leonardo Fea in Birmania e regioni vicine. 50. Nitidulides, Cucujides, et Parnides. Ann. Mus. Civ. St. Natur. 32:833-868. [Voyage of Leonardo Fea to Burma and surrounding regions.]
- Librodor japonius was collected in Burma. L. egregius is described as a new speices. (856-7)
- 127 Grouvelle, A. H. 1908. Coléoptères de la région Indienne. Rhysodidae, Trogositidae, Nitidulidae, Colydiidae, Cucujidae. Ann. Soc. Entomol. Fr., 77:315-495. [Coleoptera from the Indian Region.]
- Cryptarcha flavipennis is listed as occurring in India. A key is provided to the Indian species of Cryptarcha. (396-7)
- 128 Grouvelle, A. H. 1913. Famille des Nitidulidae. Notes synonymiques et rectifications à la nomenclature. Ann. Soc. Entomol. Fr. 81:387-400. [The Family Nitidulidae. Notes on synonymy and corrections in the nomenclature.]
- Glischrochilus quadriguttatus, formerly Ips, was assigned wrongly to Olivier, 1790. It should have been assigned to Fabricius as Ips quadriguttatus F., 1776, Gen. Ins., p. 214.

- 129 Grouvelle, A. H. 1913. Coleopterorum Catalogus. Byturidae and Nitidulidae. Section 56. W. Junk, Berlin, Germ. 14(1):1-223.

Twenty-nine species of Glischrochilus are listed. They are: abbreviatus, binaevus, christophi, clarkana, clavatus, confluentus, cruciatus, cylindricus, egregius, fasciatus, hortensis, forcipatus, ? fuscipennis, grandis, ipsoides, japonius, latefasciatus, minimus, obtusus, pantherinus, parvipustulatus, ? politus, quadriguttatus, quadripunctatus, rufiventris, sanguinolentus, subcylindricus, ultimus, and vittatus. Cryptarcha flavipennis and C. flavaguttatus are also listed. References and geographical distributions are given. (187-191)

- 130 Guttfleisch, V. 1859. Die Käfer Deutschlands. J. P. Diehl. Darmstadt. 664 pp. [The beetles of Germany.]

Descriptions and habitat information is given for Ips 4-guttata, I. 4-punctata, and I. 4-pustulata. (247)

- 131 Gyllenhal, L. 1808. Insecta Svecica. Scaris. 572 pp. [Swedish insects.]

Descriptions and habitat information are provided for the following species found in Sweden: Ips 4-pustulata, I. 4-punctata, and I. 4-guttata. (210-2)

- 132 Hamilton, J. 1895. Catalogue of the Coleoptera of southwestern Pennsylvania, with notes and description. Trans. Amer. Entomol. Soc. 22:317-381.

Ips obtusus, I. quadriguttatus, I. fasciatus, I. sanguinolentus, and I. confluentus are recorded from southwestern Pennsylvania. (331) Hosts and collection data are given. (361) [The report of I. quadriguttatus is probably in error since this species is known only from Palearctic regions. This species was probably either Glischrochilus (= Ips) fasciatus or G. (= Ips) quadrisignatus.]

- 133 Hamilton, J. 1885. Short notes on Coleoptera. Can. Entomol. 17(3):45-48.

Ips 4-guttatus, I. 4-signatus, I. bipustulatus, and I. 6-pustulatus are given as color variations of Ips fasciatus. A description of the adult of Ips fasciatus is provided. (46)

- 134 Hansen, V., W. Hellen, A. Jansson, Th. Munster, and A. Strand. 1939. Catalogus Coleopterorum Daniae et Fennoscandiae. Societas Pro Fauna et Flora Fennica. Helsingforsiae. 129 pp. [Catalog of Coleoptera of Denmark and Northern Europe.]

Librodor hortensis, L. quadriguttatus, and Glischrochilus quadripunctatus are listed. (68)

- 135 Hansen, V., E. Klefbeck, O. Sjöberg, G. Stenius, and A. Strand. 1960. Catalogus Coleopterorum Fennoscandiae et Daniae. Entomologiska Sällskapet I Lund. 476 pp. [Catalog of Coleoptera of Northern Europe and Denmark.]

Librodor hortensis, L. quadriguttatus, and Glischrochilus quadripunctatus are listed. (274-5)

- 136 Harrington, W. H. 1884. On the lists of Coleoptera published by the Geological Survey of Canada. Can. Entomol. 22:135-140, 153-160.

Ips fasciatus was collected in Canada. (158)

- 137 Hatch, M. H. 1924. A preliminary list of the Coleoptera of the Cranberry Lake Region, New York, exclusive of the Buprestidae, Cerambycidae, and Ipidae. N. Y. State Coll. Forest., Tech. Publ. 17:273-312.

Glischrochilus fasciatus and G. sanguinolentus were collected in the Cranberry Lake Region of New York. Collection dates and habitat are given. (238)

- 138 Hatch, M. H. 1925. Habitats of Coleoptera. J. N. Y. Entomol. Soc. 33:217-223.

Glischrochilus spp. are associated with a mycetobious habitat. (221)

- 139 Hatch, M. H. 1961. The beetles of the Pacific Northwest. Part 3: Pselaphidae and Diversicornia I. Univ. of Wash. Press, Seattle. 503 pp.

A key is given to the following species of Glischrochilus: sanguinolentus, fasciatus, siepmanni, quadrisignatus, vittatus, moratus and lecontei. (141-142)

- 140 Hay, C. J. 1974. Survival and mortality of red oak borer larvae on black, scarlet, and northern red oak in Eastern Kentucky. Ann. Entomol. Soc. Amer. 67(6):981-986.

Glischrochilus quadrisignatus lays eggs, and larvae develop, in the wounds caused by the red oak borer (Enaphalodes rufulus). Larvae of G. quadrisignatus were observed feeding on borer larvae. (985)

- 141 Hayashi, N. 1978. A contribution to the knowledge of the larvae of Nitidulidae occurring in Japan (Coleoptera: Cucujoidea). Insecta Matsumurana n. s. 14, 97 pp., 29 pls.

Descriptions of the larvae of Glischrochilus japonicus, G. rufiventris, and G. christophi are provided. (30-31) Illustrations of the body (49), head capsule (57), antennae (59), labroclypeal epipharynx (63), mandibles (67), maxillae (71), labium (75), hypopharyngeal schlerome (75), legs (81) and ninth abdominal segment (97) are given for the larval forms of G. japonicus. Illustrations of the larval mandible (67), legs (81), and ninth abdominal segment (97) of G. rufiventris and body (49), head capsule (57), cephalic margin of labium (63), and ninth abdominal segment (97) of G. christophi is provided. A key to the larvae of Japanese Nitidulidae, including G. japonicus, G. rufiventris and G. christophi is also given. (32-37)

- 142 Headstrom, R. 1977. The beetles of America. A. S. Barnes and Co., New York. 488 pps.

A brief description and an illustration of the elytra are given for Glischrochilus fasciatus and G. sanguinolentus. (249)

- 143 Heer, O. 1841. Fauna Coleopterorum Helvetica. Pars I. Turici. 652 pp. [Coleoptera fauna of Helvetia. Part I.]

Ips quadriguttatus, I. quadripunctatus, and I. quadripustulatus are listed. (415-6)

- 144 Hendrickson, G. O. 1930. Studies on the insect fauna of Iowa prairies. Iowa State Coll. J. Sci. 4(2):49-179.

Glischrochilus fasciatus was collected in Iowa. Location, dates, and habitats are given. (101)

- 145 Henshaw, S. 1885. List of the Coleoptera of America, North of Mexico. Amer. Entomol. Soc., Phila. Penn. 161 pp.

Ips obtusus, I. fasciatus, I. sanguinolentus, I. confluentus, I. vittatus, I. cylindricus are listed. (59)

- 146 Henshaw, S. 1895. Third supplement to the List of the Coleoptera of America, North of Mexico. Amer. Entomol. Soc., Phila., Penn. 62 pp.

The author reports that Ips fasciatus and I. geminatus listed in the "List of the Coleoptera of America, North of Mexico" are synonyms of I. quadriguttatus. (17) [This synonymy is in error since Ips quadriguttatus is known from Palearctic regions only.]

- 147 Herbst, J. F. W. 1792. Natursystem aller bekannten in-und ausländischen insecten. Pauli, Berlin. 197 pp. [Natural System of all known native and foreign insects.]

Description of Ips 4-pustulata, I. 4-punctata, and I. 4-guttata are given. (164-6) Illustrations of the above are provided. (T. 42; f. 1,2,3.)

- 148 Heyden, L. F. 1881. Catalog der Coleopteren von Sibirien. Deut. Entomol. Ges. L. Schade. Stellschreiberstr. 224 pp. [Catalog of the Coleoptera of Siberia.]

Ips christophi, I. quadripunctatus, I. rufiventris, and I. quadripustulatus were collected in Siberia. Three variations of I. quadripustulatus are listed. They are ♂ angusticallis, ♀ biguttulus and cruciatus. Collection records and distributions are provided. (93-4)

- 149 Heyden, L. F. 1893. Catalog der Coleopteren von Sibirien. Deut. Entomol. Ges. L. Schide. Stallschreiberstr. 220 pp. [Catalog of the Coleoptera of Siberia.]

The following species of Glischrochilus were collected in Siberia: bineavus, christophi, ipsoides, panthrinus, quadripunctatus, rufiventris, quadripustulatus, and quadripustulatus v. cruciatus. Collection records and distributions are provided. (61)

- 150 Heyden, L. V., E. Reitter, and J. Weise. 1891. Catalogus Coleopterorum Europae, Caucasi, et Armeniae rossicae. R. Friedlander & Sohn. Berlin. 420 pp. [Catalog of the Coleoptera of Europe, Caucasus, and Armenia.]

Glischrochilus grandis, G. latefasciatus, G. quadripunctatus, G. quadriguttatus, G. quadriguttatus var. 10-guttatus and G. quadripustulatus are listed. (163)

- 151 Hicks, E. A. 1959. Check-list and bibliography on the occurrence of insects in bird's nest. Iowa State Coll. Press, Ames, Iowa. 681 pp.
- The author reports Glischrochilus fasciatus as occurring in nests of starlings, Sturnus vulgaris. (74) (See McAtee, 1929)
- 152 Himelick, E. B. and E. A. Curl. 1958. Transmission of Ceratocystis fagacearum by insects and mites. U.S.D.A. Plant Dis. Rep. 42:538-545.
- Glischrochilus sanguinolentus and G. quadrisignatus were caught in banana bait traps in Illinois. They were not found in traps on oaks that became infected with the oak wilt fungus. (542)
- 153 Himelick, E. B., E. A. Curl, and B. M. Zuckerman. 1954. Tests on insect transmission of oak wilt in Illinois. U.S.D.A. Plant Dis. Rep. 38:588-590.
- In field tests, Glischrochilus obtusus and G. sanguinolentus, collected from oak wilt mats, failed to transmit the disease to wounded healthy trees. (589)
- 154 Hinds, T. E. 1972. Insect transmission of Ceratocystis species associated with aspen cankers. *Phytopathology* 62:221-225.
- Glischrochilus vittatus is incriminated as a vector of Ceratocystis spp. diseases.
- 155 Hinton, H. E. 1945. A monograph of beetles associated with stored products. *Brit. Mus. Natur. Hist.* 1(8):1-433.
- A key is given to the Nitidulidae associated with stored products including Glischrochilus fasciatus. Description of adult G. fasciatus, distribution, and habits are also given. (79-82)
- 156 Hisamatsu, S. 1956. The Nitidulidae of the Amani Islands south of Kyushu, Japan (Coleoptera). *Mem. Ehime Univ., Sect. 6, Agr.* 1(2):163-169.
- Librodor japonicus was collected in Japan. Distribution is given. (169)
- 157 Hisamatsu, S. 1958. A revision of Japanese Cryptarchinae (Col. Nitidulidae). *Gensei* 8:1-7.
- The author places the following species of Glischrochilus in the genus Librodor: japonicus, ipsoides, pantherinus, rufiventris, binaevus, christophi, and subcylindricus. Glischrochilus cruciatus is listed as the only Japanese member of this genus. Keys to the above species are provided.
- 158 Horn, G. H. 1875. Synonymical notes and description of new species of North American Coleoptera. *Trans. Amer. Entomol. Soc.* 5:126-176.
- A key, descriptions, and distributions are given for the following species of Ips: cylindricus, vittatus, confluentus, sanguinolentus, fasciatus, and obtusus. (133)

- 159 Horn, G. H. 1876. Synonymy of the Coleoptera of the 'Fauna Boreali-Americana, Kirby'. in Bethune, C. J. S. Insects of the northern parts of British America, Entomol. Soc. Ont. 14 pp.

Ips dejeanii Kirby is synonymous with Ips vittatus Say. (8)

- 160 Horn, G. H. 1879. Revision of the Nitidulidae of the United States. Trans. Amer. Entomol. Soc. 7:267-336.

A key to the genera of Nitidulidae found in the United States is given. The genus Glischrochilus is given as a subgenus of the genus Ips. (287) The characters of the genus Ips and a key to the species are given. Horn places I. obtusus, I. fasciatus, and I. sanguinolentus in the sub-genus Ips and I. confluentus, I. vittatus, and I. cylindricus in the sub-genus Glischrochilus. (332-324)

- 161 Hubbard, H. B. and E. A. Schwarz. 1878. Contributions to a list of the Coleoptera of the Lower Peninsula of Michigan. Proc. Amer. Phil. Soc. 17:643-666.

Ips obtusus, I. sanguinolentus, I. confluens, and I. 4-guttatus are listed. (653) [The report of I. 4-guttatus is probably in error since this species is known only from Palearctic regions. This species was probably either Glischrochilus (=Ips) quadrisignatus or G. (=Ips) fasciatus.]

- 162 Hubbard, H. G. and E. A. Schwarz. 1878. List of Coleoptera found in the Lake Superior Region. Proc. Amer. Phil. Soc. 17:627-643.

The authors report Ips sanguinolentus, I. confluens, and I. quadriguttatus as being collected in the Lake Superior Region. (634) [The report of I. quadriguttatus is probably in error since this species is only known from Palearctic regions. This species was probably either Glischrochilus (=Ips) quadrisignatus or G. (=Ips) fasciatus.]

- 163 Huber, L. L., C. R. Neiswander, and R. M. Salter. 1928. The European corn borer and its environment. Ohio Agr. Exp. Sta. Bull. 429:1-196.

Glischrochilus fasciatus adults were reported to attack injured corn borer larvae. They may also attack healthy corn borer larvae but it is unknown whether they will kill them. (79)

- 164 Hussain, N. G. 1968. The role of nitidulids in the transmission of Ceratocystis canker of quaking aspen. Colo. State Univ., M.S. Thesis. 138 pp.

Glischrochilus vittatus and G. moratus are associated with Ceratocystis cankers but sufficient numbers could not be found to study the relationships between these species and the fungus. (84) Illustrations and photographs of G. vittatus and G. moratus are provided. (38-45) A key is provided to separate the genera Coleopterus, Epuraea, and Glischrochilus. (29)

- 165 Imms, A. D. 1924. A general textbook of entomology. E. P. Dutton and Co., Inc., New York. 703 pp.

Adult Glischrochilus spp. are found under bark or at exuding sap. Larvae are predaceous upon Hylurgus, Hylobius and other xylophagous Coleoptera. (485)

- 166 Jacobson, G. G. 1905. Zhuki Rossii i zapadnoj Evropy. A. F. Dervien, St. Petersburg. 1024 pp., 83 pls. [The beetles of Russia and West Europe.]

Librodor japonius, L. nankineus, L. forcipatus, L. grandis, L. quadriguttatus, L. christophi, L. hortensis, L. latefasciatus, L. subcylindricus, L. parvipustulatus, Glischrochilus quadripunctatus, Cryptarchips clavatus, and C. flavipennis are listed. Synonyms are listed. (889)

- 167 Jacquelin-Duval, C. 1858. Famille des Nitidulides. Pages 134-160 in C. Jacquelin-Duval, Manuel Entomologique. Genera des Coléoptères d'Europe., Vol. 2, C. A. Deyrolle, Paris. [Family Nitidulidae.]

A key (160) and detailed descriptions of the genera of the family Nitidulidae included the genera Ips. (154-5) An illustration of Ips quadripunctata is provided (Pl. 41, Fig. 202).

- 168 Jantz, O. K., R. F. Gertz, and M. T. Wells, Jr. 1967. Automobile paint effective as an insect attractant. Science 156(3777):946-947.

Glischrochilus fasciatus was attracted to automobile primer paint in Michigan.

- 169 Jaques, H. E. 1951. How to know the beetles. Wm. C. Brown Co., Dubuque, Iowa. 372 pp.

A key, descriptions, illustrations, and distributions are provided for the common species of the family Nitidulidae including Glischrochilus fasciatus and G. sanguinolentus. (183)

- 170 Jelínek, J. 1965. Ergebnisse der Albanien-Expedition 1961 des Deutschen Entomologischen Institutes. Beitrag 37. Beitr. Entomol. 15:673-688. [Results of the 1961 Albanian Expedition of the Deutsches Entomologisches Institut. Contribution 37.]

Librodor quadriguttatus is known from Albania, Greece, Bulgaria, and Yugoslavia. (676) L. hortensis and G. quadripustulatus are known from Yugoslavia and Bulgaria. (677)

- 171 Jelínek, J. 1974a. Nitidulidae (Coleoptera) der Volksrepublik Mongolei. Ann. Hist.-Natur. Mus. Nat. Hung., 66:175-185. [Nitidulidae of the People's Republic of Mongolia.]

The author lists 31 species of Nitidulidae, including Glischrochilus cruciatus, from Mongolia with their localities. (185)

- 172 Jelínek, J. 1974b. Generic reclassification of the oriental Cryptarchinae (Coleoptera, Nitidulidae). Acta Entomol. Bohemoslov., 71:187-196.

The author discusses the taxonomic value of various characters and problems concerning the generic classification of the subfamily Cryptarchinae. (188-9) Cryptarcha flavipennis and C. flavoguttata are transferred to the genus Glischrochilus. (189-190) A key is provided to the genera of Cryptarchinae. The author considers the genus Cephalips Arrow as being synonymous with Glischrochilus. (190) A description of the genus Glischrochilus is provided and the subdivision of the genus into the subgenera Glischrochilus and Librodor is discussed. (193-4)

- 173 Jelínek, J. 1975. Revision of the genus Glischrochilus Reitter from the Oriental region and China (Coleoptera, Nitidulidae). Acta Entomol. Bohemoslov., 72:127-144.

Descriptions are provided for the following species of Glischrochilus: flavipennis, flavoguttatus, egregius egregius, forcipatus, and japonius japonius. G. pulcher, G. mirabilis, G. klapperichi, and G. popei are described as new species and G. egregius monticola, G. egregius cyclops, and G. japonius superbus are described as new subspecies. A key to the species and subspecies of Oriental and Chinese Glischrochilus is provided.

- 174 Jelínek, J. 1978. Ergebnisse der Bhutan-Expedition 1972 des Naturhistorischen Museums in Basel. Entomologica Basiliensia 3:171-218. [Results of the 1972 Bhutan Expedition of the Basel Natural History Museum.]

Glischrochilus flavaguttatus is recorded for the first time from Bhutan. Collection location is given. (175)

- 175 Jewell, F. F. 1954. Viability of the conidia of Endoconidiophora fagacearum Bretz, in the fecal material of certain Nitidulidae. U.S.D.A., Plant Dis. Rep. 38(1):53-54.

Conidia of the oak wilt fungus may pass through the intestinal tract of Glischrochilus fasciatus and G. sanguinolentus. Spores surviving in the feces may serve as a source of oak wilt inoculum.

- 176 Jewell, F. F. 1956. Insect transmission of oak wilt. Phytopath. 46:244-257.

Glischrochilus fasciatus, G. sanguinolentus, and G. confluentus collected from oak wilt mats were found to harbor viable spores of oak wilt disease on their bodies. (253) The three were also shown to be capable of passing viable spores of the disease in their feces. (254)

- 177 Johnson, C. W. 1927. The insect fauna in W. Procter. Biological Survey of The Mount Desert Region. The Wister Inst. Anat. Biol., Phila. 247 pp.

Glischrochilus fasciatus and G. sanguinolentus were collected in Maine. Locality and dates of collection are given. (105)

- 178 Kirby, W. 1837. Fauna boreali-Americana or the zoology of the northern parts of British America. IV. The insects. 364 pp.

Original not seen. Contains the original description of Ips dejeanii. (107) An illustration is provided. [Kirby's original description of Ips dejeanii can also be found in Bethune (1837).]

- 179 Kirejtshuk, A. G. (in press). A new species of Meligethinae and Cryptarchinae from the Oriental region [in Russian]. Entomol. Rev.

Glischrochilus laetus (Java), G. pallidus (N. India and Burma), and G. rubricollis (Vietnam) are described as new species.

- 180 Kirejtshuk, A. G. (in press). Preliminary revision of the Cryptarchinae genera from the Ethiopian Region [in Russian]. *Revue du Zoologie Afric.*

The author places Africanips niger in the genus Glischrochilus. G. kuntzeni is described as a new species.

- 181 Kirejtshuk, A. G. (in press). A new species of the subgenus Librador Reitter from the Primorie Territory with notes on synonymy of little known species [in Russian].

Glischrochilus affinis is described as a new species. G. latefasciatus (Reitter) is listed as being synonymous with G. grandis (Tourn.).

- 182 Kirk, V. M. 1969. A list of beetles of South Carolina. Part I. Northern Coastal Plain. *S. C. Agr. Exp. Sta. Bull.* 1033. 124 pp.

Glischrochilus obtusus, G. fasciatus, G. quadrisignatus, and G. sanguinolentus were collected in South Carolina. Location, habitat, and hosts are given. (73)

- 183 Kirk, V. M. 1970. A list of the beetles of South Carolina. Part 2. Mountain, Piedmont, and Southern Coastal Plain. *S. C. Agr. Exp. Sta. Bull.* 1038. 117 pp.

Glischrochilus obtusus, G. fasciatus, G. quadrisignatus, and G. sanguinolentus were collected in South Carolina. Location, habitat, and hosts are given. (68)

- 184 Kleine, R. 1909. Die Europäischen borkenkäfer und ihre feinde aus den ordnungen der Coleopteren und Hymenopteren. *Entomol. Bl.* 5:41-50, 76-79. [The European barkbeetles and their enemies of the orders Coleoptera and Hymenoptera.]

Glischrochilus quadripustulatus is listed as an enemy of Myelophilus pinipeida (45) and G. quadriguttatus an enemy of Xyleborus cryptographus. (77)

- 185 Kloet, G. S. and W. D. Hincks. 1945. A checklist of British insects. T. Buncl and Co., Ltd., Stockport. 483 pp.

Glischrochilus quadripunctatus and G. quadripustulatus are listed. (186)

- 186 Knowlton, G. F. 1942. Nitidulidae in corn. *J. Econ. Entomol.* 35:105.

Glischrochilus quadrisignatus quadrisignatus was abundant inside ears of sweet and field corn in Utah. G. quadrisignatus canadensis was collected from tops of sugar beets and from blossoming cow parsnip and death camas in Utah.

- 187 Kolbe, H. J. 1886. Beiträge zur kenntniss der Coleopteren - Fauna Koreas. *Arch. Natur.* 52(1):139-240. [Contribution to the knowledge of the Coleoptera fauna of Korea.]

Ips parvipustulata is described as a new species. It was found associated with Helota sp. on oak and buckeye trees in June. Ips japonia, also collected in Korea, was found associated with Helota sp. on elm and chestnut trees in June and July. (180-1)

- 188 Kôno, H. 1940. Die Nitiduliden und Cucujiden in Tannen-und fichtenwald in Japan. *Insecta Matsumurana* 14:56-62. [The nitidulids and cucujids of the fir and spruce forest in Japan.]

Glischrochilus cruciatus and G. subcylindricus are found in the fir and spruce forests of Japan. G. cruciatus was collected from the galleries of Hylurgops longipillus. G. subcylindricus was collected from the galleries of H. longipillus and Cryptorrhynchus tamanukii. (58-59)

- 189 Küster, H. C. 1845. Die käfer Europa's. Zweites Heft. Bauer and Raspe. Nürnberg. 100 pp. [The beetles of Europe. Vol. II.]

Ips quadriguttatus, I. quadripunctatus, and I. quadripustulatus occur in Europe. Description and distribution information are provided. (16-18)

- 190 Lacordaire, J. T. 1854. Histoire naturelle des insectes. Genera des Coleopteres. Paris, Roret. 8. 548 pp. [Natural history of insects. Genera of Coleoptera.]

A description of the genus Ips is provided. The author lists the following species as members of the genus Ips: I. 4-guttata, I. 4-punctata, Nitidula sanguinolenta, N. fasciata, I. obtusa, I. 4-signata, I. 4-vittata, I. bipustulata, I. geminata, I. 4-pustulata, Demestes ferrugineus, I. arcuata, I. confluenta, I. sepulcralis, and I. dejeanii. Distribution is provided. (327-8)

- 191 Lameere, A. 1900. Fn. Belg. II.

Original not seen. Believed to contain information on Ips quadripunctatus, I. quadriguttatus, and I. quadripustulatus on pages 354-5.

- 192 Latrielle, P. A. 1804. Histoire naturelle, générale et particulière des crustacés et des insectes. Tome Dixième. Dufart, Paris. 445 pp. [Natural history, general and particular, of the crustaceans and the insects.]

Descriptions and distributions are provided for Nitidula sanguinolenta, N. fasciata, N. quadripustulata, N. quadripunctata, N. quadriguttata, and N. decemguttata. (30-32)

- 193 Leach, J. G. 1940. Insect transmission of plant diseases. McGraw-Hill Book Co., Inc., New York. 615 pp.

Glischrochilus fasciatus is listed as a vector of fire blight (Erwinia amylovora). (567)

- 194 Leach, J. G., R. P. True, and C. K. Dorsey. 1952. A mechanism for liberation of spores from beneath the bark and for diploidization in Chalara quercina. *Phytopath.* 42:537-539.

The author reports that cracks made in the bark by expanding oak wilt mats permit insects, including Glischrochilus sanguinolentus, G. fasciatus, and G. confluentus, to transfer spores of opposite compatibility groups to receptive mycelial mats and thus bring about ascospore formation. (537)

- 195 Leach, J. G., C. K. Dorsey, R. P. True, and H. L. Barnett. 1952. Insects and the oak wilt fungus. Science, Agr. Exp. Sta., W. Virginia Univ. Bull. 357(2):8-9, 16.

Glischrochilus sanguinolentus is reported as a possible vector of oak wilt. (8)

- 196 Lechanteur, F. 1959. Un genre nouveau de Coléoptère Nitidulidae d'Afrique. Bull. Ann. Soc. Roy. Entomol. Belg. 95:107-110. [A new genera of Coleoptera (Nitidulidae) from Africa.]

Africanips, described as a new genus, is reported as being very similar to the genus Glischrochilus. The genotype, A. niger, is described as a new species. A. niger will later be placed in the genus Glischrochilus by Kirejtshuk.

- 197 LeConte, J. L. 1859. The complete writings of Thomas Say on entomology of North America. Estes and Lauriat, Boston, Mass. 2:1-814.

The author gives Say's original description of Engis confluenta, Colydium bipunctatum, Ips obtusa, I. 4-signata, I. vittata and I. 4-maculata. The author places Colydium bipunctatus, in the genus Ips. (183) Ips 4-maculata is placed in the genus Engis. (645)

- 198 LeConte, J. L. 1863. List of the Coleoptera of North America. Part 1. Smith. Misc. Collect. 140. 49 pp.

The following species of Ips are listed as occurring in North America: fasciatus, quadrisignatus, bipustulatus, geminatus, obtusus, sanguinolentus, cylindricus, confluens, dejeanii, and vittatus. (30)

- 199 LeConte, J. L. 1863. New species of North American Coleoptera. Smith. Misc. Collect. 167. 177 pp.

The following species of Ips are listed as occurring in North America: obtusus, fasciatus, 4-signatus, sanguinolentus, 4-vittatus, geminatus, confluentus, bipustulatus, dejeanii, sepulchralis. (42) Ips cylindricus is described as a new species. (64-5)

- 200 LeConte, J. L. and G. H. Horn. 1883. Classification of the Coleoptera of North America. Smith. Inst. Misc. Collect. 507. 567 pp.

A key is given to the genera of Nitidulidae including Ips. (151)

- 201 Leng, C. W. 1920. Catalogue of the Coleoptera of America, North of Mexico. J. D. Sherman, Jr., Mt. Vernon, N. Y. 470 pp.

Glischrochilus obtusus, G. fasciatus, G. sanguinolentus, G. confluentus, G. vittatus and G. cylindricus are listed. G. bipustulatus, G. quadriguttatus, G. quadrisignatus, and G. sexpustulatus are given as synonyms for G. fasciatus. G. rubromatulatus is given as a synonym for G. sanguinolentus and G. dejeanii and G. sepulchralis are listed as synonyms of G. vittatus. Distribution records are provided. (197)

- 202 Leng, C. W. and A. J. Mutchler. 1933. Second and third supplements to catalogue of the Coleoptera of America, North of Mexico. J. D. Sherman, Jr., Mt. Vernon, N. Y. 112 pp.

Glischrochilus quadrisignatus, G. siepmanni, G. moratus, and G. lecontei are listed. G. canadensis is listed as a subspecies of G. quadrisignatus. G. similis and G. bipustulatus are given as synonyms of G. quadrisignatus canadensis. G. cylindricus is listed as a synonym of G. lecontei. G. rubromaculatus is listed as a subspecies of G. sanguinolentus. G. quadrimaculosus is given as a subspecies of G. fasciatus. G. germinatus is listed as a subspecies of G. fasciatus quadrimaculosus. Distribution records are provided. (86)

- 203 Leonard, M. D. 1926. A list of the insects of New York with a list of spiders and certain other allied groups. Cornell Univ. Agr. Exp. Sta. Mem. 101. Ithaca, N. Y. 1121 pp.

Glischrochilus obtusus, G. fasciatus, G. sanguinolentus, G. confluentus, G. vittatus were collected in New York. Collection location and hosts are given. (379)

- 204 Lindegren, J. E. and G. T. Okumura. 1973. Pathogens from economically important nitidulid beetles. USDA. ARS W-9. Western Region. 7 pp.

Beauveria bassiana (Bals.) and Aspergillus sp. were reported from Glischrochilus quadrisignatus by Steinhaus and Marsh (1962). (7)

- 205 Linnaeus, C. 1758. Systema Naturae. Tomus I. Editio Decima. Holmiae. 823 pp. [System of Nature. Vol. I. Edition 10.]

Silpha 4-punctata is described as a new species. Distribution and habitat is given. (359)

- 206 Linnaeus, C. 1761. Fauna Svecica. Stockholmiae. 578 pp. [Fauna of Sweden.]

Silpha quadripustulata is described as a new species. Distribution and habitat is given. (148) Silpha quadripunctata is also listed. (149)

- 207 Loding, H. P. 1945. Catalogue of the beetles of Alabama. Geol. Surv. of Ala., Univ. of Ala. Monogr. 11. 172 pp.

Glischrochilus obtusus, G. fasciatus, G. quadrisignatus, and G. sanguinolentus were collected in Alabama. Collection location and date are given. (76)

- 208 Logsdon, G. 1980. Disease-free raspberries. Organic Gardening 27(7):76-79.

The Willamette variety of raspberries seems to be resistant to picnic bugs whereas Lowden Black is very susceptible to these insects. [Picnic bug is a common name for either Glischrochilus quadrisignatus or G. fasciatus.]

- 209 Luckmann, W. H. 1963a. Biology and control of the picnic beetle, Glischrochilus quadrisignatus (Say). Proc. N. Cent. Br. Entomol. Soc. Amer. 18:38-39.

Distribution within Illinois, life-history, habits and control of Glischrochilus quadrisignatus are discussed.

- 210 Luckmann, W. H. 1963b. Observations on the biology and control of Glischrochilus quadrisignatus. J. Econ. Entomol. 56:681-686.

Data are presented on the distribution, life-history, habits, and control of Glischrochilus quadrisignatus.

- 211 Luckmann, W. H. and E. T. Hibbs. 1959. Present status in the North Central States of some nitidulids known to damage sweet corn. Proc. N. Cent. Br. Entomol. Soc. Amer. 14:81-82.

The nitidulids, including Glischrochilus quadrisignatus, that occur on sweet corn are discussed.

- 212 Lutz, F. E. 1935. Field book of insects. G. P. Putnam's Sons, N. Y. 562 pp.

Glischrochilus spp. are commonly found under fallen decaying fruit as well as about flowing sap. (296)

- 213 MacGillivray, A., and C. O. Houghton. 1902. A list of insects taken in the Adirondack Mountains, New York. - I. Entomol. News. 13(8):247-253.

Ips fasciatus was collected in New York. (250)

- 214 MacLeay, W. 1873. The insects of Gayndah. Trans. Entomol. Soc. N. S. Wales II. 378 pp.

Ips politus is described as a new species. (163)

- 215 Mader, L. 1938. Coleopterologische Notizen. Entomol. Z. 51:284. [Coleoptera Notes.]

A new aberration, Librodor rufiventris a. posticepunctatus, is described.

- 216 von Mannerheim, C. G. 1852. Zweiter nachtrag zur Käferfauna der Nord-Amerikanischen Lander des Russischen Reiches. Bull. Moscou. 1852. T. 25., P.1., 283-387.

[Second supplement to the beetle fauna of the Russian provinces in North America.]

Original not seen. Believed to contain information on Ips vittatus on page 335.

- 217 Marseul, S. 1876. Bibliographie: Bulletin de la Société Suisse d'Entomologie, t. III. L'Abeille 14:1-20.

The author provides Tournier's original description of Ips grandis. Distribution is given. (45-6).

- 218 Marseul, S. 1878. Archeologie Entomologique. Coléoptères rapportés de Sibérie par Schrenk, etc., par V. Motschulsky. L'Abeille. 16:51-168.

The author provides Motschulsky's original description of Ips angusticollis, Ips biguttula, and Ips cruciata. Distribution is provided. (94-5)

- 219 Marseul, S. 1885. *Precis des genres et especes de la tribu des nitidulides de l'Ancien Monde*. *L'Abeille* 23:19-142. [Summary of the genera and species of the tribes of the nitidulids of the Old World.]

Descriptions of Ips 4-guttata, I. christophi, I. 4-punctata, I. 4-pustulata, I. rufiventris, Cryptarcha pantherinus, C. ipsoides, and C. binaevus are provided. (128-132)

- 220 Marsham, T. 1802. *Entomologia Britannica*. London. 548 pp. [Entomology of Great Britain.]

Ips 4-pustulata is listed as occurring in Great Britain. (130)

- 221 McAtee, W. L. 1929. Further notes on insect inhabitants of bird houses. *Proc. Entomol. Soc. Wash.* 31(6):105-111.

Glischrochilus fasciatus was found in a nest box of starlings, Sturnus vulgaris, in Maryland. (106)

- 222 McCoy, C. E., and T. A. Brindley. 1952. Those four-spotted bugs....friend or foe? *Iowa Farm Science* 6:180-181.

The authors report that the four-spotted fungus beetle were responsible for the death of at least 10 percent of the European corn borers which became half-grown. (181) [This beetle may be Glischrochilus quadrisignatus.]

- 223 McCoy, C. E. and T. A. Brindley. 1961. Biology of the four-spotted fungus beetle, Glischrochilus q. quadrisignatus, and its effect on European corn borer populations. *J. Econ. Entomol.* 54(4):713-7.

Observations were made on the overwintering sites, emergence, mating, oviposition, and larval habitats of Glischrochilus q. quadrisignatus. The authors also presented data demonstrating that G. q. quadrisignatus reduce populations of the European corn borer, Ostrinia nubilalis, by entering borer tunnels thereby crowding out or mechanically injuring the larvae.

224. McMullen, L. H., C. R. Drake, R. D. Shenefelt, and J. E. Kuntz. 1955. Long distance transmission of oak wilt in Wisconsin. *Plant Dis. Rep.* 39(1):51-53.

Glischrochilus sanguinolentus, G. fasciatus, and G. quadrisignatus were incriminated as possible vectors of oak wilt disease in Wisconsin. (52)

- 225 McMullen, L. H. and R. D. Shenefelt. 1961. Nitidulidae collected from banana bait traps in Wisconsin. *Wisc. Acad. Sci. Arts and Letters. Trans.* 50:223-237.

Glischrochilus obtusus, G. sanguinolentus, G. fasciatus, G. quadrisignatus were collected from banana bait stations in Wisconsin. (237) Data are presented on the seasonal abundance of G. sanguinolentus, G. fasciatus, and G. quadrisignatus. (235)

- 226 McMullen, L. H., R. D. Shenefelt, and J. E. Kuntz. 1960. A study of insect transmission of oak wilt in Wisconsin. *Wis. Acad. Sci., Arts and Letters. Trans.* 49:73-84.

Glischrochilus sanguinolentus, G. fasciatus, and G. quadrisignatus were collected from mycelial mats of Ceratocystis fagacearum. (74) Experimental transmission of oak wilt was demonstrated with the above species. (78)

- 227 Medvedev, L. N. 1972. Nitidulidae and Phalacridae (Coleoptera) of the Mongolian People's Republic. In Insects of Mongolia I. Acad. Sci. USSR and Acad. Sci. MPR.

Glischrochilus quadripustulatus and G. cruciatus were collected in Mongolia. Distribution and collection records are provided. (480)

- 228 Melsheimer, F. E. 1845. Descriptions of new species of Coleoptera of the United States. Proc. Acad. Nat. Sci. Phil. 2:98-118.

Ips 4-maculosa, I. bipustulatus, I. similis, I. bipunctatus, and I. geminatus are described as new species. (107-108)

- 229 Melsheimer, F. E. 1853. Catalogue of the described Coleoptera of the United States. Smith. Inst., Washington, D. C. 174 pp.

The following species of Ips are listed from the United States: obtusus, fasciatus, 4-signatus, sanguinolentus, 4-vittatus, geminatus, confluentus, bipustulatus, dejeanii, and sepulcralis. (42)

- 230 Miwa, Y. 1931. A systematic catalogue of Formosan Coleoptera. Entomol. Lab. Taihoku Univ. Contrib. No. 32. 359 pp.

Glischrochilus japonius was collected in Formosa. General and local distributions are provided. (65)

- 231 Mjöberg, E. 1906. Om nagra svenska insekters biologi och utveckling. Arkiv Zool. 3(6):1-22. [About the biology and development of some Swedish insects.]

The author describes the biology of Ips quadripustulata. Descriptions and illustrations of the young larva, fullgrown larva, and pupa are provided (2-6; t.1, f.1-3).

- 232 Moennich, H. 1939. List of Coleoptera found living in and on various fungi. Bull. Brooklyn Entomol. Soc., 34:155-7.

Glischrochilus fasciatus was collected from Lactarius piperatus Fries in New York. (156)

- 233 Morris, C. L., H. E. Thompson, B. L. Hadley, Jr., and J. M. Davis. 1955. Use of radioactive tracer for investigation of the activity pattern of suspected insect vectors of the oak wilt fungus. USDA Plant Dis. Rep. 39(1):61-63.

Through the use of radioactive tracers, G. fasciatus, G. sanguinolentus, and G. quadrisignatus were shown to be highly attracted to the mycelial mats of the oak wilt fungus. (63)

- 234 Motschulsky, T. V. 1857. Insects du Japan. Etudes Entomologiques, Victor Motschulsky, Helsingfors VI:25-41.

Ips japonia is described as a new species. (28-9)

- 235 Motschulsky, T. V. 1860. Coléoptères de la Sibérie orientale et en particulier des rives de l'Amour (rapportés par Schrenck, Maack, Ditmar, Voznessenski). Schrenck Reisen-U. Forschungen im Amurlande. St. Petersburg. 4. T. 2, Liefr. 2, 77-257. [Coleoptera of eastern Siberia and in particular the rivers of the Amour.]

Original not seen. Contains the original description of Ips cruciatus, I. biguttulus, I. angusticollis, and I. biguttulus. (129)

- 236 Munro, J. W. 1917. The genus Hylastes Erich., and its importance in forestry. Proc. Roy. Soc. Edinburgh. 20(3):123-58.

Glischrochilus quadripustulatus is a predator of eggs and larvae of bark beetles in England.

- 237 Munro, J. W. 1926. British bark beetles. Roy. Forest. Comm. Bull. 8.

Glischrochilus quadripustulatus is a predator of eggs and larvae of bark beetles in England.

- 238 Murray, A. 1964. Monograph of the family of Nitidulariae. Trans. Linn. Soc. London. 24(3):211-413.

The genus Ips differs from the rest of the family in that the epistome projects over the mandibles. It has a five segmented tarsi of which the fourth segment is smallest. An illustration of the tarsus of Ips 4-signata is provided. (225)

- 239 Murtfeldt, M. E. 1903. Another yucca feeding insect. Entomol. News 14:293-295.

A nitidulid, believed to be Ips fasciatus was collected from Yucca filamentosa in Missouri.

- 240 Mussen, E. C. 1969. Some laboratory observations on the development and behavior of Glischrochilus quadrisignatus (Nitidulidae). M.S. Thesis. Univ. of Minn. 76 pp.

Data are presented on the culturing, development at various temperatures, egg production and longevity of adults, reaction to the physical environment, and gustatory responses of Glischrochilus quadrisignatus.

- 241 Mussen, E. C. and H. C. Chiang. 1974. Development of the picnic beetle, Glischrochilus quadrisignatus (Say), at various temperatures. Environ. Entomol. 3(6):1032-1034.

Data are presented on the rate of development of immature Glischrochilus quadrisignatus at various temperatures.

- 242 Neel, W. W., B. D. Glick, L. L. May, and R. P. True. 1967. Attractiveness to Nitidulidae (Coleoptera) of natural attractants of tree and fungus origin supplemented with vinegar and water in an Appalachian hardwood forest. J. Econ. Entomol. 60(4):1104-1108.

Glischrochilus s. sanguinolentus was collected at bait stations in West Virginia. (1106)

- 243 Norris, D. M. 1953. Insect transmission of oak wilt. Plant Dis. Rep. 37(8):417-418.

Glischrochilus sanguinolentus, G. fasciatus, G. quadrisignatus were shown to be capable of transmitting Entoconidiophora fagacearum when caged on healthy, wounded oak trees.

- 244 Norris, D. M. 1955. Natural spread of Entoconidiophora fagacearum Bretz to wounded red oaks in Iowa. Plant Dis. Rep. 39(3):249-253.

Insects, including Glischrochilus quadrisignatus, that feed on oak wounds are incriminated as a means of overland spread of the oak wilt fungus (Entoconidiophora fagacearum).

- 245 Nourteva, M. 1956. Über den Fichtenstamm-Bastkäfer, Hylurgops palliatus Gyll., und seine Insektenfeinde. Acta Entomol. Fenn. 13:1-118. [About the spruce-stem bark beetle, Hylurgops palliatus Gyll., and its insect enemies.]

The author reports that Glischrochilus 4-punctatus larvae developed normally when fed eggs of Pissodes and Cerambycidae. He expresses the belief that in nature the larvae can live off bark beetle eggs as well as sap. (55-6) In a number of experiments G. 4-punctatus larvae ate an average of 9.09 bark beetle eggs per day. (71) Glischrochilus sp. was found in the brood frass of bark beetle larvae. (76-7) Glischrochilus 4-punctatus was observed preying on Hylurgops palliatus and Hylastes ater larvae. In the literature G. 4-punctatus is reported to prey on Dendroctonus micans, Blastophagus piniperda, Hylurgops palliatus, Trypodendron signatum, Ips typographus, and Orthotomicus laricis. (92-3)

- 246 Nussler, H. 1973. Zwei neuheiten der sächsischen käferfauna. Entomol. Nachr. 1973/1:11-13. [Two novelties of the Saxony beetle fauna.]

Glischrochilus quadrisignatus is reported as being new to Saxony. Descriptions and illustrations are provided to aid in distinguishing G. quadrisignatus from G. hortensis.

- 247 Olivier, M. 1790. Entomologie, ou histoire naturelle des insectes. Coléoptères. Vol. 2. Paris, Baudouin. 485 pp. 63 pl. [Entomology, or natural history of the insects.]

Nitidula fasciata, N. sanguinolenta, N. quadripunctata, and N. decemguttata are described as new species. The author places Ips quadriguttata (F.) and Silpha quadrisputulata in the genus Nitidula (7-11). Illustrations of the above species are provided (pl. 2-3).

- 248 Olivier, M. 1811. Histoire naturelle. Insectes. Encyclopédie Methodique VIII. 722 pp. [Natural history. Insects.]

Descriptions and distributions are provided for Nitidula fasciata, N. sanguinolenta, N. quadripustulata, N. quadripunctata, N. quadriguttata, and N. decemguttata. (212-3)

- 249 Osmun, J. V. and W. H. Luckmann. 1964. How to identify and control the picnic beetle. Pest Control 32(4):32, 34.

Information is provided on the biology and control of Glischrochilus quadrisignatus.

- 250 Packard, A. S. 1869. Guide to the study of insects. H. Holt and Co., New York. 715 pp.

A brief description and discussion of habitats are provided for Ips sanguinolentus and I. fasciatus. (445) An illustration of the larva and adult of I. fasciatus is given. (444)

- 251 Packard, A. S. 1888. List of the spiders, myriapods, and insects of Labrador. Can. Entomol. 20(8):141-149.

Ips sanguinolentus was collected in Labrador. (143)

- 252 Panzer, G. W.F., C. Geyer, and G. A. W. Herrich Schaeffer. 1793. Faunae insectorum Germanicae initia, oder Deutschlands insecten. Nuremberg. 190 pts., oblong 12 mo., 4544 plates. Vol. 3. [Initial German insect fauna or German insects.]

Habitat and an illustration of Ips quadriguttata. (3.18)

- 253 Paradis, R. O., B. Parent, I. Rivard, and M. Mailloux. 1974. Les ravageurs des cultures fruitières dans le sud-ouest de Québec en 1973. Ann. Soc. Entomol. Québec. 19:113-114. [Pests of cultivated fruit in south-west Quebec in 1973.]

Glischrochilus quadrisignatus was destructive in raspberries at harvest time. The greatest infestations were always encountered in areas near corn fields which are important reproductive sites of the beetle. (114)

- 254 Parsons, C. T. 1943. A revision of Nearctic Nitidulidae (Coleoptera). Bull. Mus. Comp. Zool. 92(3):119-278.

Glischrochilus sanguinolentus sanguinolentus, G. s. rubromaculatus, G. obtusus, G. fasciatus, G. siepmanni, G. quadrisignatus quadrisignatus, G. q. canadensis, G. vittatus, G. leonti, G. confluentus, and G. moratus are given as the nearctic species of Glischrochilus. Distribution, description, and key are included. (264-273)

- 255 Paykull, G. von. 1800. Fauna Svecica. Insecta. Tomus III. Upsaliae. 459 pp. [Swedish Fauna. Insects. Vol. 3.]

Descriptions and habitat information are given for the following Swedish species: Ips 4-pustulata, I. 4-punctata, and I. 4-guttata. (341-4)

- 256 Payne, J. A. and E. W. King. 1969. Coleoptera associated with pig carrion. Entomologist's Monthly Magazine. 105:224-232.

Glischrochilus quadrisignatus and G. fasciatus were attracted to pig carrion in South Carolina. (231)

- 257 Pearson, D. L. 1966. Ecological studies of the Coleoptera associated with cow manure. M.S. Thesis, Purdue Univ. 61 pp.

Glischrochilus fasciatus was collected by Sanders (1966, J. Econ. Entomol.) from cow manure. (6)

- 258 Pennsylvania Cooperative Economic Insect Report. 1979. Economic and Faunistic Insect Survey of Pennsylvania. Frost Entomol. Mus. Dept. Entomol., The Penn. State Univ. No. 24. 3 pp.

Glischrochilus quadrisignatus quadrisignatus were observed on a mimosa tree (Albizia julibrissin) in Chester Co., Pennsylvania. (2)

- 259 Perris, E. 1876. Larves de Coléoptères. Ann. Soc. Linn. Lyon. XXII:259-418. [Larvae of Coleoptera.]

The author provides a description of the larvae of Ips quadripunctata. (301-2) Illustrations are provided (Fig. 29-32).

- 260 Peterson, A. 1956. Atlas des larves d'insectes de France. N. Boubée and Co., Paris. 222 pp. [Atlas of the larvae of the insects of France.]

An illustration of the larva of Glischrochilus sp. is given. (184)

- 261 Pic, M. 1926. Entomologische ergebnisse der Schwedischen Kamtchatka-Expedition 1920-1922. Arkiv Zool. 18B(3):1-5. [Entomological results of the Swedish Kamtchatka Expedition 1920-1922.]

Glischrochilus 4-pustulatus var. brevenotatus is described as a new variety. Collection location is provided. (1)

- 262 Plaza, E. 1974. Géneros de Nitidulidae de la Peninsula Ibérica. Graellsia 30:113-127. [The genera of Nitidulidae of the Iberian Peninsula.]

A key is given to the genera of Nitidulidae, including Glischrochilus. (124) Glischrochilus quadripunctatus is listed as occurring in Iberia. (127)

- 263 Polozhentsev, P. A. and V. F. Kozlov. 1975. Entomofagi koroedov. Zashchita Rostenii. 1:41-43. [Predators of bark beetles.]

Glischrochilus quadripunctatus is a predator of many species of bark beetles in Russia. A brief description of the adults and larvae is provided. (42)

- 264 Porta, A. 1929. Fauna Coleopterorum Italica. Stab. Tipogr. Piacentino. Piacenza. 466 pp. [Coleopterous Fauna of Italy.]

A key to the Italian species of Nitidulidae including Glischrochilus quadripustulatus, Librodor quadripunctatus, and L. quadriguttatus is provided. Variations are listed. (165-6)

- 265 Porta, A. 1949. Fauna Coleopterorum Italica. Supplementum II. Stab. Tipogr., G. Gandolfi. Sanremo. 386 pp. [Coleoptera Fauna of Italy.]

Glischrochilus quadripustulatus L. is synonymous with G. quadripunctatus L.

- 266 Portein, G. 1931. Histoire naturelle des Coléoptères de France. Tome II. Encyclopedie Entomologique. Paul Lechevalier & Fils. Paris. 560 pp. [Natural history of the Coleoptera of France.]

Keys to the species of Nitidulidae of France including Librodor olivieri, L. quadriguttatus and Glischrochilus quadripustulatus are provided. An illustration of G. quadripustulatus is given. (157-8)

- 267 Pree, D. J. 1969. Control of Glischrochilus quadrisignatus (Say) (Coleoptera: Nitidulidae), a pest of fruit and vegetables in southwestern Ontario. Proc. Entomol. Soc. Ont. 99:60-64.
- Mixtures of baits and insecticides were effective in controlling Glischrochilus quadrisignatus in Ontario. The fungus, Beauveria bassiana, was effective in killing beetles in the laboratory.
- 268 Procter, W. 1938. Biological survey of the Mount Desert Region. Part VI. The insect fauna. Wistar Inst. of Anat. and Biol., Phila. 496 pp.
- Glischrochilus fasciatus, G. quadrisignatus, G. sanguinolentus, G. quadrisignatus var. vera, and G. siepmanni are listed. Habitat and relative abundance is provided. (130)
- 269 Purdue University. 1969. Picnic Beetles. Coop. Ext. Dep. 2 pp.
- Descriptions and methods of control of picnic beetles (= Glischrochilus spp.) are given.
- 270 Randall, J. W. 1838. Description of new species of Coleopterous insects inhabiting the state of Maine. Boston J. Natur. Hist. 2(1):1-33.
- Ips sepulcralis is described as a new species. (19)
- 271 Rathore, Y. S. and C. S. Sengar. 1969. New records of nitidulid and rhizophagid beetles on maize cobs in the U. P. Tarai. J. Bombay Natur. Hist. Soc. 69(1):208-9.
- Mentions Glischrochilus fasciatus and G. quadrisignatus quadrisignatus as being pests of sweet corn in North Carolina. (208)
- 272 Redtenbacher, L. 1849. Die käfer. Fauna Austriaca. Carl Gerold's Sohn. 883 pp. [Beetles. Fauna of Austria.]
- Original not seen. Believed to have information on Ips quadripustulata, I. quadrigutta and I. quadripunctata. (173)
- 273 Redtenbacher, L. 1858. Die käfer. Fauna Austriaca. Ed. II. Carl Gerold's Sohn. 1021 pp. [The Beetles. Fauna of Austria.]
- The author provides a key to the Austrian species of Nitidulidae including Ips quadriguttata, I. quadripustulata and I. quadripunctata. (388)
- 274 Redtenbacher, L. 1874. Die käfer. Fauna Austriaca. Ed. III. Carl Gerold's Sohn. 567 pp. [Beetles. Fauna of Austria.]
- The author provides a key to the Austrian species of Nitidulidae including Ips quadriguttata, I. quadripustulata, and I. quadripunctata. (370)
- 275 Reitter, E. 1873. Systematische Eintheilung der Nitidularien. Verhandl. Naturforsch. Ver. Brünn 12:1-193. [Systematic classification of the Nitidulidae.]

Ips chinensis, I. obtusus, I. fasciatus, I. quadrisignatus, I. quadripunctatus, I. quadriguttatus, I. rubromaculatus, and I. sanguinolentus are listed in the subgenus Ips and Ips quadripustulatus, I. dejeani, and I. confluentus are listed in the subgenus Glischrochilus. Ips rubromaculatus is described as a new species. Distribution is provided.

- 276 Reitter, E. 1874. Beschreibungen neuer Käfer-Arten nebst synonymischen Notizen. Verhandl. Zool.-Bot. Ges. Wien., 24:509-529. [The descriptions of new beetle species along with synonymic notes.]

Ips chinensis Rtrr. is synonymous with I. japonius Motsch. (514)

- 277 Reitter, E. 1875. Die europäischen Nitidularien. Deut. Entomol. Z., 19(3):1-30. [The European Nitidulidae.]

Ips grandis, I. quadripunctatus, I. quadriguttatus, and I. quadripustulatus are listed. Descriptions are given. (30)

- 278 Reitter, E. 1879. Beitrag zur synonymie der Coleopteren. Verhandl. Zool.-Bot. Ges. Wien., 29:507-512. [Contribution to the synonymy of the Coleoptera.]

Ips davidis Fairm. and var. nankineus Fairm. are synonymous with I. chinensis Rtrr. and I. japonicus Motsch. (508)

- 279 Reitter, E. 1879b. Verzeichniss der von H. Christoph in Ost-Sibirien gesammelten clavicornier etc. Deut. Entomol. Z., 23:209-226. [Catalogue of the clavicorns collected by H. Christoph in eastern Siberia, etc.]

Cryptarcha pantherina, C. binaeva, C. ipsoides, Ips christophi, and I. rufiventris are described as new species. (217-219) Ips quadripunctatus and I. quadripustulatus were also collected from eastern Siberia. (211)

- 280 Reitter, E. 1883. Rev. Mens. Entomol. Petropol. I.

Original not seen. Believed to contain the original description of Ips latefasciatus on page 41.

- 281 Reitter, E. 1884-1885. Die Nitiduliden Japans. Wien. Entomol. Zeit., 3:257-272, 4:75-80, 101-103, 173-176.

In Volume 3, a key to the Japanese species of Nitidulidae included the following species of the genus Librodor: pantherinus, clavatus, rufiventris, binaevus, ipsoides, japonicus, quadriguttatus, and subcylindricus. (271) L. clavatus and L. subcylindricus are described as new species in Volume 4. (80, 101) Collection data for the above species are also provided in Volume 4. (175)

- 282 Reitter, E. 1911. Die Käfer des Deutschen Reiches. Fauna Germanica. III. K. G. Lutz Verlag. Stuttgart. 436 pp. [The beetles of the German States.]

Librodor olivieri, L. quadriguttatus, and Glischrochilus quadripustulatus are included in a key to the German Coleoptera. Larvae of G. quadripustulatus

are reported to inhabit the galleries of Hylurgus ligniperda and adults the galleries of Myelophilus piniperda. I. quadriguttatus is reported from Xyleborus cryptographus galleries. (38) The author erects a new genus, Cryptarchips, and places Glischrochilus pantherinus and G. rufiventris in it. (30)

- 283 Richardson, J. 1837. Fauna Boreali-Americana; or the zoology of the northern parts of British America. Fletcher, Norwich. 327 pp.

Contains Kirby's original description of Ips dejeanii. The author erroneously places it in the family Engidae. (107) An illustration is provided (Pl. 2; fig. 7).

- 284 Riley, C. V. 1879. The banded Ips in calyx of pear. Answers to correspondents. The Amer. Entomol. Bot. 2(10):308.

Ips fasciatus is reported as feeding on pears. (308)

- 285 Saalas, U. 1917. Die fichtenkäfer Finnlands. I. Ann. Acad. Sci. Fenn. Ser. A. Vol. VIII. 1-547. [The spruce beetles of Finland.]

Glischrochilus quadripustulatus is reported to occur on spruce trees in Finland. It is found most often under the bark of both standing and lying logs of fresh dead trees, less often in the stump. The larvae are reported to inhabit the galleries of Myelophilus piniperda, Ips laricis, I. typographus, and Hylastes palliatus. An adult was found in the gallery of Dendroctonus micans. (210-211, 491-495)

- 286 Sahlberg, C. 1820. Dissertatio entomologica insecta Fennica enumerans. (Coleoptera). Aboae, Frenckel. 8. [Entomological dissertation on a number of Finland insects.]

Original not seen. Believed to contain information on Ips quadripunctatus and I. quadripustulatus on page 71.

- 287 Sahlberg, . 1889. Enum. Col. Fenn.

Original not seen. Believed to contain information on Ips quadripunctatus, I. quadriguttatus, and I. quadripustulatus on pages 84-5.

- 288 Sala, J. T. 1962. Catalogo de la coleccion entomologica "Torres Sala". de Coleopteros y Lepidopteros de Todo el Mundo. Institucion Alfonso El Magnanimo. Diputacion Provincial de Valencia. 487 pp. [Catalog of the entomological collection "Torres Sala". The Coleoptera and Lepidoptera of the world.]

Librodor 4-guttatus and Glischrochilus 4-pustulatus are listed. (209)

- 289 Sanford, J. W. and W. H. Luckmann. 1963. Observations on the biology and control of the dusky sap beetle in Illinois. Proc. N. Cent. Br. Entomol. Soc. Amer. 18:39-43.

Adults of Glischrochilus quadrisignatus were found in ears of sweet corn in Illinois. (41)

- 290 Saunders, E. 1888. Index to Panzer's Fauna Insectorum Germaniae. Garney & Jackson, London. 49 pp.

The index lists Ips quadriguttata from volume 3, number 18 in Panzer's Fauna Insectorum Germaniae. (30)

- 291 Say, T. 1823. Descriptions of coleopterous insects collected in the late expedition to the Rocky Mountains, performed by order of M. Calhoun, Secretary of War, under the command of Major Long. J. Acad. Nat. Sci. Phila., 3:139-331.

Engis confluenta and Colydium bipunctatum are described as new species. (125, 183)

- 292 Say, T. 1835. Descriptions of new North American coleopterous insects, and observations on some already described. Boston J. Nat. Hist. 1(2):151-203.

Ips obtusa, I. 4-signata, I. vittata, and I. 4-maculata are described as new species. Engis confluenta, Nitidula fasciata, and N. sanguinolenta are placed in the genus Ips. (169-170)

- 293 Schaufuss, C. 1916. Calwer's Käferbuch. Einführung in die kenntnis der käfer Europas. E. Schweizerbart'sche, Stuttgart. 709 pp. [Calwer's Beetle Book. Introduction to knowledge of European beetles.]

A key is given for the nitidulid genera of Europe. Glischrochilus is among the genera listed. (442) Description, habitat, and distribution information is provided for Glischrochilus olivieri (= quadripunctatus Ol.) (= hortensis Geoffr.), G. quadriguttatus, and G. quadripustulatus. G. latefasciatus and G. grandis are listed. (444-5)

- 294 Schilsky, J. 1909. Systematisches verzeichnis der käfer Deutschlands und Deutsch-Oesterreiches. Strecker & Schröder, Stuttgart. 221 pp. [Systematic record of the beetles of Germany and German colonies.]

Glischrochilus olivieri, G. quadriguttatus, G. quadriguttatus v. 10-guttatus, and G. quadripustulatus are listed. G. quadripunctatus Oliv. is synonymous to G. olivieri and G. quadripunctatus Deg. is synonymous to G. quadripustulatus. (86)

- 295 Schlechtendal, D. H. R. von. and O. Wünsche. 1879. Die Insecten. Eine anleitung zur kenntniss derselben. B. G. Teubner, Leipzig. 707 pp. [The insects. A guide to one's knowledge.]

A key to the German insects includes Ips quadripunctatus and I. quadripustulatus. (37)

- 296 Schneider, O. and H. Leder. 1878. Beiträge zur kenntniss der kaukasischen käferfauna. W. Burkhart, Brünn. 359 pp. [Contribution to the knowledge of beetle fauna of Caucasus.]

Ips 4-pustulatus is listed. (160)

- 297 Schönherr, J. 1972. Pheromon beim kiefern-borkenkäfer "Waldgartner", Myelophilus piniperda L. (Coleopt., Scolytidae). Z. Angew. Entomol. 71(4):410-413. [A pheromone of the pine bark-beetle, Myelophilus piniperda L. (Coleoptera, Scolytidae).]

Olfactometer tests show that Glischrochilus quadripustulatus is attracted to a pheromone of Myelophilus piniperda. (412)

- 298 Schwarz, E. A. 1878. The Coleoptera of Florida. Proc. Amer. Phil. Soc. 17:353-469.

Ips sanguinolentus is reported as occurring in Florida. (447)

- 299 Scriba, L. G. 1793. Beiträge zur Insectengeschichte. Heft 3. Varrentrapp, Frankfurt. 280 pp. [Contribution to the insect story.]

Ips 4-notata is described as a new species. (224-5) An illustration is provided. (T. 14, f. 5.)

- 300 Seidlitz, G. 1891a. Fauna Baltica. Die kaefer (Coleoptera) der Deutschen Ostseeprovinzen Russlands. Hartungsche, Königsberg. 818 pp. [Baltic Fauna. The beetles of German Baltic provinces of Russia.]

A key to the Baltic beetles included the following species of the genus Ips: quadripunctatus, quadriguttatus, and quadripustulatus. (50, 222)

- 301 Seiditz, G. 1891b. Fauna Transsylvanica. Die Käfer (Coleoptera) Siebenbürgens. Hartungsche, Kanigsberg. 915 pp. [Transsylvanian Fauna. The Beetles (Coleoptera) of Siebenburg.]

A key to the Transsylvanian beetles includes Ips quadriguttatus, and I. quadripustulatus. (237)

- 302 Sharp, D. 1886. On New Zealand Coleoptera. Trans. Roy. Dublin Soc. 2(3):391.

Ips minimus is described as a new species. (391)

- 303 Sharp, D., A. Matthews, and G. Lewis. 1887-1905. Biologia Centrali-Americana. Insecta. Coleoptera. Vol. II. Pt. I. Bernard Quaritoh Ltd., London. 717 pp.

Ips ultimus is described as a new species. The authors question the validity of I. fuscipennis. (387) An illustration of I. ultimus is provided (Fig. 21).

- 304 Sharp, D. and F. Muir. 1912. The comparative anatomy of the male genital tube in Coleoptera. Trans. Entomol. Soc. London. 1912 - Part III, 477-639.

A description of the male genital tube of Ips japonius is given. (515) An illustration of the genital armature of I. japonius is provided (Pl. 56).

- 305 Sherman, J. D. 1910. A list of Labrador Coleoptera. J. N. Y. Entomol. Soc. 18:173-197.

Ips sanguinolentus is listed. Collection location is given. (191)

- 306 Shubeck, P. P.; N. M. Downie, R. L. Wenzel, S. B. Peck. 1977. Species composition of carrion beetles in a mixed-oak forest. Wm. L. Hutcheson Mem. Forest Bull. 4(1):12-17.

Glischrochilus quadrisignatus was collected at carrion in New Jersey. (13-14)

- 307 Shuckard, W. E. 1861. The British Coleoptera delineated. Henry G. Bohn. London. 76 pp.

The author gives a brief description of Ips quadripustulatus and places it in the family Engidae. Habitat and distribution are also given. (25) An illustration is provided (Pl. 30, Fig. 7).

- 308 Siepmann, C. G. 1931. On the validity of Glischrochilus quadrisignatus (Say) (Coleoptera, Nitidulidae) Bull. Brooklyn Entomol. Soc. 26:24-29.

The author provides a key for separation of Glischrochilus fasciatus and G. quadrisignatus. G. geminatus Melsh. is listed as a synonym of G. fasciatus Oliv. and G. fasciatus var. 4-maculosus a variation of this beetle. G. bipustulatus Melsh. is listed as a synonym of G. quadrisignatus Say, and G. quadrisignatus var. sempustulatus Reitter a synonym of G. quadrisignatus var. similis Melsh. (27-30) The author also discusses the genitalia of G. fasciatus, G. quadrisignatus, G. japonica, and G. obtusus. Illustrations are given. (30-35)

- 309 Skälbeck, T. C. 1976. The distribution of Nitidulidae in deciduous forests of Minnesota. Ph.D. Thesis. Univ. Minn. 204 pp.

Glischrochilus fasciatus, G. quadrisignatus, G. siepmanni, G. sanguinolentus, and G. obtusus were collected from oak wilt mats, wounded oaks, and odor baits. Distribution and abundance rank are given.

- 310 Smith, J. B. 1900. Insects of New Jersey. MacCrellish and Quigly, Trenton, N. J. 755 pp.

Ips obtusus, I. fasciatus, and I. sanguinolentus are listed as occurring in New Jersey. Habitat and state distribution is provided. (238)

- 311 Smith, J. B. 1910. Annual report of the New Jersey State Museum including a report of the insects of New Jersey. MacCrellish and Quigly, Trenton, N. J. 888 pp.

Ips obtusus, I. fasciatus, and I. sanguinolentus are listed. Habitat and state distribution are given for each species. (274)

- 312 Spornraft, K., 1967. 50. Familie: Nitidulidae. Pages 20-77 in H. Freude, K. W. Harde, and G. A. Lohse, eds. Die Käfer Mitteleuropas. Vol. 7. Goecke and Evers, Krefeld.

Glischrochilus quadripunctatus, G. quadriguttatus, and G. hortensis are included in a key to the genus Glischrochilus. Illustrations of the aedeagus and prosternum of the above species along with an illustration of an adult G. quadripunctatus is provided. (74-5)

- 313 Spornraft, K. 1972. Glischrochilus quadrisignatus (Say), eine neue adventivart fur Mitteleuropa. (Coleoptera, Nitidulidae). Nachr. Bayer. Entomol. 21:54-8. [Glischrochilus quadrisignatus (Say) a new adventitious species for Middle Europe (Coleoptera, Nitidulidae).]

Glischrochilus quadrisignatus is reported as a new adventitious species in Europe. Collection records are given. Descriptions and illustrations are provided to differentiate G. quadrisignatus from G. hortensis, G. quadriguttatus, and G. quadripunctatus.

- 314 Stambaugh, W. J., C. L. Fergus, F. C. Craighead, and H. E. Thompson. 1955. Viable spores of Endoconidiophora fagacearum from bark and wood-boring beetles. Plant Dis. Rep. 39(11):867-871.

Viable spores of Endoconidiophora fagacearum were recovered from Glischrochilus sanguinolentus in Pennsylvania. (868)

- 315 Steinhaus, E. A. 1946. Insect microbiology. Comstock Publ. Co., Inc., Ithaca, N. Y. 763 pp.

The author erroneously places Ips pini, I. grandicollis, I. emarginatus, I. integer, and I. oregoni (Coleoptera: Scolitidae) in the genus Glischrochilus and reports them as vectors of blue stain disease of conifers. (411)

- 316 Steinhaus, E. A. and G. A. Marsh. 1962. Reports of diagnoses of diseased insects. Hilgardia 33(9):349-490.

Glischrochilus quadrisignatus is attacked by two species of fungi, Aspergillus sp. and Beauveria bassiana, in Iowa. (387)

- 317 Stephens, J. F. 1830. Illustrations of British Entomology. Mandibulata. Vol. 3. Baldwin and Cradock, London. 379 pp.

Description, habitat, and distribution are provided for Ips quadriguttata, I. quadripustulata, and I. quadripunctata. (93-94)

- 318 Stickney, F. S. 1923. The head-capsule of Coleoptera. Ill. Biol. Monogr. 8(1):1-104.

An illustration of the dorsal aspect, ventral aspect, lateral aspect, and endoskeleton of the head of Glischrochilus fasciatus is provided. (61, 75, 89, 101)

- 319 Stierlin, G. and V. V. Gautard. 1867. Die käfer-fauna der Schweiz. Schaffhausen und Vevey. 372 pp. [The Swiss beetle fauna.]

Ips quadriguttata, I. quadripunctata, and I. quadripustulata are listed. Collection locations are given. (137)

- 320 Sturm, J. 1839. Deutschlands Fauna. V. Die Insecten. Nurnberg, Verfasser. Kl. 8. (German Fauna. 5. The Insects.)

Original not seen. Believed to contain information on Ips quadripunctatus, I. quadriguttatus, and I. quadripustulatus on pages 94-99.

- 321 Summers, S. V. 1875. List of Coleoptera of St. Louis County, Missouri. Can. Entomol. 6(3):52-55.

Ips fasciatus and I. 4-signatus are listed. (954)

- 322 Tamanuki, K. 1927. Über sechs neue Käfer aus Sachalin mit der beschreibung zwei neuer aberrationen. Dobutsagaku Zasshi 39(40):76-82. [Six beetles new from Sachalin with description of two new aberrations.]

Glischrochilus quadripunctatus is reported from Sachalin. (77, 81)

- 323 Tamanuki, K. 1932. Miscellanea of the Coleoptera - species of Saghalien Island, II. On the unrecorded genera of the Nitidulidae from South-Saghalien Island. Kontyu 6(3):100-110.

A key to the species of Glischrochilus from South-Saghalien Island includes G. pantherinus, G. ipsoides, G. subsylindricus, and G. 4-punctatus cruciatus.

- 324 Tanner, V. M. 1927. A preliminary study of the genitalia of female Coleoptera. Trans. Amer. Entomol. Soc. 53:5-50.

A description and illustrations of the female genitalia of Glischrochilus cylindricus is given. (28, 49)

- 325 Thomson, C. G. 1862. Skandinaviens Coleoptera. Tom. IV. Lund. 269 pp. [Scandinavian Coleoptera.]

Ips quadriguttata, I. quadripunctata, and I. quadripustulata are listed. Brief descriptions are provided. (139)

- 326 Tournier, H. 1872. Coléopters Européens et Circumeuropéens. Descriptions d'espèces nouvelles. Schweiz. Entomol. Ges. 3:436-448. [Coleoptera of Europe and around Europe.]

Ips grandis is described as a new species. (440)

- 327 Trella, T. 1923. Wykaz chrzaszczow okolic Przemysla. Pol. Pismo Entomol. 2:110-123. [A list of the beetles from the Przemysl area.]

Glischrochilus olivieri, G. 4-guttatus, G. 4-guttatus var. 10-guttatus, and G. 4-pustulatus were collected in the Przemysla, Poland area. G. olivieri var. puncticollis and G. 4-p a. turnicus are described as new varieties. (112)

- 328 USDA. 1955. Coop. Econ. Insect Report 5(6):118, (41):966^{3/}.

Glischrochilus sp. were less numerous in Iowa than in 1953, possibly due to a dry June and July. (118) G. quadrisignatus heavily infested ripening strawberries at Pullman, Washington. Sound fruits were attacked. (966)

^{3/} U. S. Dep. of Agriculture, Cooperative Economic Insect Report, began with Vol. 1, No. 1, July 31, 1951. It contains reports of insect occurrence and abundance, particularly of economic pests, from information supplied by Survey Entomologists in the various states and by others. In 1976 it was replaced by Cooperative Plant Pest Report, Vol. 1, No. 1, Feb. 6, 1976, which, in addition, reports occurrence of plant diseases. Issued by Plant Protection and Quarantine Programs, Animal and Plant Health Inspection Service, U. S. Dept. of Agriculture.

329 USDA. 1956. Coop. Econ. Insect Rep. 6(7):129, (31):754.

In 1955 Glischrochilus quadrisignatus damaged strawberries in the Pullman, Washington area. This was the first record of this insect feeding on strawberries in Washington. (129) G. fasciatus was numerous and troublesome in Indiana. (754)

330 USDA. 1957. Coop. Econ. Insect. Rep. 7(29):569, (30):601.

Glischrochilus fasciatus was abundant in injured ears of sweet corn at Columbus and Marietta, Ohio. (569) Glischrochilus sp. were economically important in picked strawberries and raspberries ready for market in Indiana. (601)

331 USDA. 1958. Coop. Econ. Insect Rep. 8(18):352, (20):399, (35):764.

Glischrochilus quadrisignatus was abundant and pestiferous being economically important in picked strawberries and raspberries ready for market in Indiana. (352) In New York, Glischrochilus spp. were present in corn but were not important economically. (399) Damage to strawberries in the Moscow area of Idaho was reported. (764)

332 USDA. 1959. Coop. Econ. Insect Rep. 9(11):175, (28):620, (29):643, (33):746.

Glischrochilus quadrisignatus invaded ripe fruit in North Carolina (175) and was unusually abundant at Columbus, Ohio on early sweet corn; invariably associated with European corn borer tunnels in ears and stalks. (620) In Illinois, this species was the most abundant of any year in the past 10. They may be entering undamaged ears of silking sweet corn (643) and adults ranged 0-30 per 100 ear tips or silks in field corn in northern areas. (746)

333 USDA. 1960. Coop. Econ. Insect Rep. 10(17):320, (31):701, (33):758.

Glischrochilus quadrisignatus was collected from sweet corn in August 1959 in North Dakota. (320) This species was found in 42.5 percent of stalks and ears of early sweet corn in untreated check plots at Columbus, Ohio on July 8 and always found associated with either European corn borer or corn earworm damage. (701) Glischrochilus spp. was reported as being unusually abundant throughout Ohio congregating in tunnels of European corn borer and corn earworm and in tassels, particularly those injured by other species. (758)

334 USDA. 1961. Coop. Econ. Insect Rep. 11(13):255, (29):654, (31):714, 735, (33):773.

Glischrochilus spp. were particularly troublesome when cooking was done out-of-doors in Indiana. (255) G. quadrisignatus adults averaged 0.5 per ear in untreated sweet corn in the East St. Louis area (654) and infested 0-72 percent (avg. 10.6) of corn plants in west-southwest Illinois with 0-344 (avg. 45) adults per 100 plants. (714) This species was abundant and annoying in northern Ohio. (735) G. quadrisignatus was very abundant in northern Illinois infesting 0-80 percent of corn plants; range 0-80 per 100 plants. (773) Late-generation Glischrochilus spp. adults were very abundant in picnic and recreational areas of Indiana. (920)

- 335 USDA. 1962. Coop Econ. Insect Rep. 12(9):127, (12):272, (18):434, (29):788.

In 1961 Glischrochilus quadrisignatus was abundant in corn fields in the northern two-thirds of Illinois in late July and August with up to 100 percent of the plants infested. The highest population observed was 344 adults per 100 plants.

(127) Glischrochilus spp. were troublesome to picnickers throughout Indiana, and in northern Ohio G. quadrisignatus was abundant and annoying during 1961.

(272) In Wisconsin, the first G. quadrisignatus of the season were found in rye and alfalfa on April 25 in Kenasha and Dane Counties. (434) In Indiana, G. fasciatus were very abundant in silks of corn and tips of ears near Lafayette. Glischrochilus spp. were becoming very common in corn tassels fed on by European corn borer in western and southwestern Wisconsin. (788)

- 336 USDA. 1963. Coop. Econ. Insect Rep. 13(16):416-7, (24):660, (25):694, (29):840, (30):847, 872, (32):906, (33):943, (35):1015, (40):1208.

Glischrochilus spp. were of considerable nuisance in Indiana, disrupting picnics and other outdoor activities. Although G. quadrisignatus was nearly as prevalent as other years in Wisconsin corn fields, it caused less concern to picnickers than during 1961. (416-7) Glischrochilus spp. larvae were abundant in old, rotten corn ears and adults annoyed family outings in Indiana. (660) Populations of Glischrochilus spp. increased significantly in Wisconsin (694) and were extremely annoying in Marion and Tippecanoe Counties in Indiana. (840) In Ohio, G. quadrisignatus adults infested sweet corn in Van Wert Co. (847), were observed in Hamilton Co., and heavy flights occurred between 4 and 6 P. M. in Mercer Co. Complaints were received in Van Wert Co. concerning flights to screen doors and into homes. (872) Early sweet corn was heavily infested in Darke Co., Ohio. (906) G. quadrisignatus were taken from areas on corn ears where Ostrinia nubilalis were present (943) and were appearing on melons in the Fargo area North Dakota. (1015) Adults were still active on late-maturing field corn in northwest Ohio causing damage on silks and ear tips of green corn. (1208)

- 337 USDA. 1964. Coop. Econ. Insect Rep. 14(14):299, (17):381, (20):485, (28):780, (29):789, (31):866, (32):906, (39):1112.

Glischrochilus quadrisignatus began appearing in Wisconsin during the first warm days of May and by mid-June became troublesome to picnickers. Infestations appeared less than in 1962. (299) The beetles were observed in corn fields in Wisconsin. (381) Glischrochilus spp. were abundant in melon-growing areas of southwest Indiana (485) and adults and pupae were collected near corn roots in Porter Co., Indiana. (780) In Ohio, adult G. quadrisignatus caused considerable damage to sweet corn in Clermont Co. Adults ranged 0-12 per 100 corn plants in central and eastern Illinois. Increasing numbers of Glischrochilus sp. adults caused considerable concern to Indiana homeowners and campers. (789) G. quadrisignatus adults attacked sweet corn in Hardin Co. (866) and Warren Co., Ohio. (906) This same species infested sweet corn, potatoes, tomatoes, onions, strawberries, and raspberries in Ohio. (1112)

- 338 USDA. 1965. Coop. Econ. Insect Rep. 15(10):164, (18):415, (29):779, (30):813, (31):851, (32):887, 909, (33):923, (34):958-9, (39):1092, (42):1183.

Glischrochilus quadrisignatus was abundant in corn fields in Illinois that

were infested with the European corn borer (164), was noted in a corn field in Dane Co., Wisconsin (415), and were common on plants infested with European corn borer in Ohio. (779) G. quadrisignatus adults were attracted to marginal rows of corn infested by Blissus leucopterus in Illinois. (813) In Wisconsin, adults in corn fields were associated with corn borers and in Ohio they were common in sweet corn being most numerous on plants infested with aphids or Ostrinia nubilalis. Adults ranged from 0 to 164 per 100 corn plants (avg. 18) in east Illinois. (851) In Michigan, Glischrochilus spp. were common in ears of sweet corn, in aphid colonies near corn tassels, on ripe and overripe fruits and vegetables, and around picnic tables. G. quadrisignatus were reported burrowing into tassels and whorls of field corn in Lorain Co., Ohio; severity of infestation warranted 2 control applications. (887) In Wisconsin this species was becoming a problem in situations where food was exposed; particularly attracted to bananas and other foods at picnics. (909) Glischrochilus spp. adults were numerous in aphid colonies near tassels of corn in central Michigan, and on tomatoes in Berrien Co., Michigan. (923) In Wisconsin, G. quadrisignatus was numerous in ears of corn feeding on kernels near tip. Glischrochilus spp. adults continued to be numerous in corn with many found in aphid colonies or in areas damaged by adult corn rootworms (Diabrotica spp). Late infestations of G. quadrisignatus were reported on corn silks in Defiance Co., Ohio (1092) and few were present in fields of corn. (1183)

- 339 USDA. 1966. Coop. Econ. Insect Rep. 16(7):112, (30):721, 722, (32):773, (33):812, (35):865, (51):1151.

Glischrochilus quadrisignatus was very abundant in Illinois in corn fields attacked by Blissus leucopterus. (112) Glischrochilus sp. averaged 11-23 per infested corn plant in east central Indiana. G. quadrisignatus adults ranged 0-300 per 100 corn plants in Illinois. Infestations in Michigan were most numerous in corn plants damaged by borers. The same species was reported infesting corn and entering homes in Madison Co., Ohio. (721-722) G. quadrisignatus adults were abundant in corn infested by aphids or European corn borer in northern Illinois. (773) In Franklin Co., Idaho, G. quadrisignatus was reported as feeding on ripe strawberries and raspberries. (812) G. fasciatus caused damage requiring control on raspberries in southern Michigan. (865) G. quadrisignatus was unusually abundant throughout southwestern Ontario on raspberries, sweet corn, and tomatoes and on sweet corn in southwestern Quebec. (1151)

- 340 USDA. 1967. Coop. Econ. Insect Rep. 17(9):141, (31):696, 699.

Glischrochilus quadrisignatus was abundant in northern Illinois, apparently attracted to corn heavily infested by corn leaf aphid. Larvae were abundant in sweet corn infested with corn earworm in Umatilla Co., Oregon. (141) G. quadrisignatus infestations ranged 7-26 per corn plant in Indiana. Beginning colonies were reported in Michigan and Delaware. Infestations ranged 10-70 percent in Southern Ohio. Heavy infestations were reported in Alabama where maize dwarf mosaic was widespread. In Ohio, the spotted lady beetle, flower bugs, and minute pirate bugs were reported as predators. (696) G. quadrisignatus was common on corn heavily infested with Rhopalosiphum maidis or damaged by Ostrinia nubilalis. (699)

- 341 USDA. 1968. Coop. Econ. Insect Rep. 18(35):833.

Up to 15 Glischrochilus quadrisignatus per corn ear tip were common in southern and southwestern Ohio; often associated with European corn borer damage.

- 342 USDA. 1970. Coop. Econ. Insect Rep. 20(13):203, (33):586.

Glischrochilus quadrisignatus was reported as tunneling into strawberries and destroying the crop at Saint Anthony, Fremont Co., Idaho, during August. (203) The same species infested ripe peaches in Knox County, Ohio. (586)

- 343 USDA. 1971. Coop. Econ. Insect Rep. 21(11):152.

Up to 25 Glischrochilus sp. adults per corn plant in Indiana infested many fields in axils, damaged ears, or at damaged sites.

- 344 USDA. 1973. Coop. Econ. Insect Rep. 23(31):507.

Heavy infestations of Glischrochilus quadrisignatus occurred in corn in Wisconsin. Most occurred in tunnels of Ostrinia nubilalis but large numbers were found in silks and exposed ears.

- 345 USDA. 1974. Coop. Econ. Insect Rep. 24(12):151.

Glischrochilus fasciatus was reported as causing damage to sweet corn ears in Penobscot County, Maine.

- 346 USDA. 1978. Coop. Plant Pest Rep. 3(39):558.

West Virginia is a new state record for Glischrochilus quadrisignatus. Adults and larvae were reported as feeding on decaying potato seed pieces in Randolph County.

- 347 USDA. 1979. Guidelines for the control of insect and mite pests of foods, fibers, feeds, ornamentals, livestock, forests, and forest products. Agr. Handbook 554. 822 pp.

Malathion at one pound per 100 gallons is recommended to control Glischrochilus quadrisignatus on cane berries (blackberry, boysenberry, dewberry, loganberry, and raspberry). (30)

- 348 Vogt, G. B. 1950. Occurrence and records of Nitidulidae. Coleopt. Bull. 4(6):81-91.

Glischrochilus obtusus, G. fasciatus, G. s. sanguinolentus, and G. q. quadrisignatus were collected from oak sap flows in Maryland. Seasonal abundance is given. (87) G. fasciatus, G. s. sanguinolentus, and G. q. quadrisignatus were collected from rotten apples in Maryland. (91)

- 349 Vogt, G. B. 1951. Occurrence and records of Nitidulidae. Coleopt. Bull. 5(1):4-11.

A literature review on the occurrence and biology of Nitidulidae included the following references on Glischrochilus: Blatchley (1910), Forbes (1894), Hinton (1945), Kleine (1909), Knowlton (1942), Moennich (1939), Murtfeldt (1903), and Weiss and West (1920).

- 350 Walsh, B. D. 1867. Answers to correspondents. Pract. Entomol. 2(5):56.

Ips 4-signatus is reported to damage apples, pears, and sweet corn.

- 351 Webster, F. M. 1894. Insects of the year. Insect Life 7(2):202-207.

Ips fasciatus are reported as infesting households, feeding on breads, cakes, and other sweets. (207)

- 352 Weiss, H. B. and E. West. 1920. Fungous insects and their hosts. Proc. Biol. Soc. Wash. 33:1-20.

Ips quadriguttatus was collected from Polyporus betulinus and P. cuticularis in New Jersey and from Pleurotus ostreatus in Connecticut. (7)

- 353 Weiss, M. J. and R. N. Williams. 1980. Some host-parasite relationships of Microctonus nitidulidis and Stelidota geminata. Ann. Entomol. Soc. Amer. 73(3):323-6.

In laboratory studies, Glischrochilus fasciatus and G. quadrisignatus were not parasitized by Microctonus nitidulidis, a braconid parasite of Stelidota geminata.

- 354 Westcott, C. 1973. The gardener's bug book. Doubleday and Co., Inc., New York. 689 pp.

Glischrochilus fasciatus is found in decaying fruits. (142)

- 355 Westwood, J. O. 1849. An introduction to the modern classification of insects. Vol. 2. Longman, Orme, Brown, Green, and Longmans, London. 158 pp.

A brief description of Ips 4-pustulata is given. (12)

- 356 Wilde, W. H. A. 1970. Glischrochilus quadrisignatus, the sap beetle, a pest of apple in Ontario. Can. Entomol. 102:112.

Glischrochilus quadrisignatus was observed damaging McIntosh and Spy apples in Ontario.

- 357 Williams, R. N., K. V. Miller, and M. J. Weiss. 1981. Parasitism of the picnic beetle, Glischrochilus fasciatus (Coleoptera: Nitidulidae), by the tachinid, Hyalomyodes triangulifer (Diptera: Tachinidae). J. Kansas Entomol. Soc. (in press).

The authors reported that Glischrochilus fasciatus is parasitized by Hyalomyodes triangulifer. Dissection of field collected G. fasciatus from north-central Ohio revealed 1.3% parasitism. G. quadrisignatus was not found to be parasitized by this tachinid.

- 358 Windels, M. B., C. E. Windels, and T. Kommedahl. 1976. Association of fusarium species with picnic beetles in corn ears. *Phytopathology* 66:328-331.

Buried ears of corn serve as inoculum sources for ear-infecting Fusarium spp. through the activities of Glischrochilus quadrisignatus.

- 359 Winkler, A. 1926. *Catalogus Coleopterorum regionis palaercticae*. Pars. 6:625-752, A. Winkler, Dittesgasse 1702 pp. [Catalog of the Coleoptera of the palearctic region.]

The author lists the palearctic species, synonyms, and varieties of the genera Librodor and Glischrochilus and Cryptarchips. The species, varieties, and synonyms of Librodor are: japonicus (= chinensis, dauidis, nankineus), forcipatus, christophi, quadriguttatus (var. decemguttatus, var. subinterruptus, var. bidisjunctus, var. diversenotatus), grandis, latefasciatus, hortensis (= quadripunctatus, olivieri) (var. subornatus, var. puncticollis), rufiventris (= semipunctatus, nigricolor), and subcylindricus. The species, varieties, and synonyms of Glischrochilus are: quadripunctatus (= quadripustulatus, angusticollis, biguttulus) (var. bistigma, var. turnicus, var. cruciatus, var. zoufali, var. niger), clavatus, and parvipustulatus. The species, varieties, and synonyms of Cryptarchips are: binaevus (var. ipsiformis, var. cryptarchoides, var. flavipennis), ipsoides, pantherinus. Geographic distribution is provided. (705)

- 360 Wolcott, C. W. 1948. The insects of Puerto Rico. Nitidulidae. *J. Agr. Univ., Puerto Rico* 32(2):295-297.

Glischrochilus spp. occur in Puerto Rico. (297)

- 361 Wollaston, T. V. 1874. *Thesaur. Entomol. Oxon.*

Original not seen. Believed to contain the original description of Ips clarkana (71) from Brazil. An illustration may also be provided (t.5, f.10).

- 362 Zetterstedt, J. W. 1828. *Fauna Insectorum Lapponica*. (Coleo, Ortho, Hemip.). Hammone, Schulz. [Insect Fauna of Lappland.]

Original not seen. Believed to contain information on Ips quadripunctatus and I. quadripustulatus on pages 148-9.

- 363 Zetterstedt, J. W. 1840. *Insecta Lapponica descripta*. Lipsiae, Voss. 1139 pp. [Descriptions of the insects of Lappland.]

Ips quadripunctata and I. quadripustulata are listed. Brief descriptions and distribution are provided. (100)

- 364 Zukan, N. K. 1932. *Iconographia Insectorum Japonicorum*. Part II. Hokuryukan, Tokyo. 2241 pp.

Glischrochilus japonicus and G. rufiventris are illustrated. (709)

365 Apfelbeck, V. 1930. Fauna Insectorum Balcanica. VII. 2.

Glischrochilus hortensis, G. quadriguttatus, and G. quadripunctatus are listed. (342-343).

366 Nunberg, M. 1976. Klucze do oznaczania owadów Polski (Coleoptera: Nitidulidae). Polskie Towarzystwo Entomologiczne. PWN, Warszawa. Cs. XIX. Z. 65. 92 pp. [Keys to the identification of insects in Poland.]

A key to the Nitidulidae of Poland included Glischrochilus quadripunctatus, G. quadriguttatus, and G. hortensis. Illustrations of various morphological characteristics are provided. (82-83)

367 Reitter, E. 1877. Mitt. Munch. Entomol. Ver., I.

Original not seen. Believed to contain the original description of Ips janthinus on page 130.

368 Hayashi, N. 1980. Illustrations for identification of larvae of the Cucujoidea (Coleoptera) found living in dead trees in Japan. Mem. Educ. Inst. Priv. Sch. Jap. 72:95-147.

Glischrochilus christophi and G. rufiventris are found in dead trees in Japan. (102-104) Illustrations of important morphological characteristics of the larvae of the above species are provided. (Pl. 4., Figs. a-k.)

SUBJECT INDEX

This index was compiled to provide easy retrieval of information on specific species, hosts, locations, etc. Information on a specific species may be found under its current name or under synonyms or subspecies (see List of Species on pages 3-7). Information on collection localities may be listed under state, province, country, region, or continent depending on the information provided.

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