

Revision of the Genus *Saprosites* Redtenbacher, 1858 (Coleoptera : Aphodiinae) in New Zealand

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Abstract

THE genus *Saprosites* Redtenbacher is redefined and a key given to the New Zealand species in the genus. Six species are redefined; two species, *Aphodius suspectus* Sharp and *A. pascoei* Sharp, are synonymised; two new species, *S. rugosus* n.sp. and *S. punctatus* n.sp., are described; and two other species are discussed.

INTRODUCTION

THE subfamily Aphodiinae belongs to the family Scarabaeidae of the superfamily Scarabaeoidea. These beetles, which are mainly of small size and dull colouration, are dung-feeding and are useful scavengers. They may be distinguished by the presence of two spurs on the hind tibiae, antennae with nine segments and concealed labrum and mandibles. The group has world-wide distribution, but is not particularly well represented in New Zealand. The genus *Aphodius*, the largest and commonest genus in the subfamily, is not represented in New Zealand except for one or two introduced species; the genus *Proctophanes* is represented by one introduced species; the genus *Phycochus* is a native genus containing two species; and the genus *Saprosites* is represented by ten species. Possibly due to more intensive collecting in the Auckland district, these beetles appear to be most common in the northern part of New Zealand. The occurrence of an endemic species on the Chatham Islands and another on the Kermadec Islands is of interest.

Aphodiids are attracted by light, and occasionally fly in large numbers into houses at night, causing alarm but no damage. One species only, the introduced species *Aphodius tasmaniae*, is a pest in New Zealand, more particularly in Canterbury, where the larvae feed on grasses and clovers as well as roots.

Genus *SAPROSITES* Redtenbacher, 1858

1858. *Saprosites* Redtenbacher, *Fauna Austriaca Die Käfer*, ed. 2, p. 436.

1904. *Saprosites* Redtenbacher, Blackburn, *Proc. Roy. Soc. Vict.*, 17 (new series), (1): 174.

1910. *Saprosites* Redtenbacher, Schmidt, *Genera Insectorum, Fasc. 110*: 103.

1910. *Saprosites* Redtenbacher, Schmidt, *Coleopt. Cat.* 20: 79.

1922. *Saprosites* Redtenbacher, Schmidt, *Das Tierreich Lief.* 45: 389, 398.

In 1858, Redtenbacher erected the genus *Saprosites* to describe a new species of Aphodiid, *Saprosites peregrinus*, found in large numbers in the orchid-houses of Schönbrunn, Vienna, and believed to have been introduced into Europe in soil from America. Since then members of this genus have been recorded in most parts of the world. It is by far the largest Aphodiid genus represented in New Zealand.

Saprosites is very closely related to Illiger's genus *Aphodius*, but Redtenbacher, although he realised that they were separate genera, failed to define the diagnostic characters which distinguish them. In his key to the European genera of Aphodiidae he distinguished *Saprosites* from *Aphodius* by saying that in *Aphodius* at rest the top part of the eye is not covered, whereas in *Saprosites* it is. In all specimens of *Saprosites* examined by the author the eye has never been covered. All members of the genus *Saprosites* examined by the author possess a strongly punctured groove

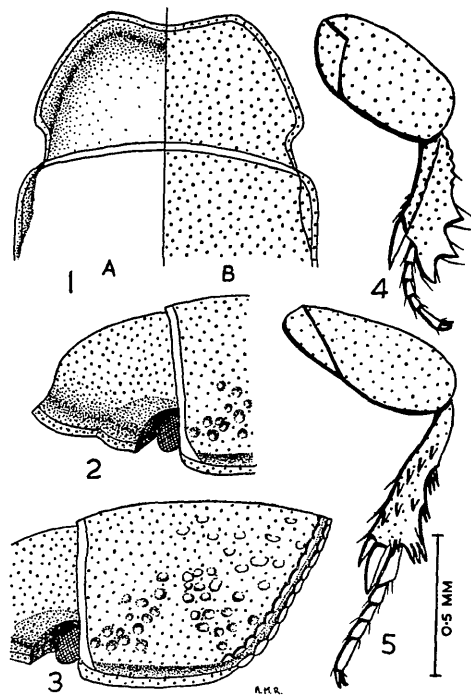


FIG. 1.—*Saprosites browni* (Sharp). 1—Dorsal view of head; A, showing shape; B, showing punctation. 2—Lateral view of head. 3—Lateral view of pronotum. 4—Left fore leg. 5—Left hind leg.

COLOUR. Basic colour piceous; anterior border of head, lateral border of pronotum and legs rufous; anterior border of pronotum testaceous.

HEAD. 1, 2. Convex, 1.9 wider than long, densely punctulate, punctures deeper and longer at proximal end; with well marked clypeal suture; clypeus grooved inside margin, more deeply disto-medianly. Eyes large.

PRONOTUM. 3. Convex, approximately 1.7 wider than long; all borders convex; glabrous; anterior angle rounded. Surface densely punctulate intermingled with large deep punctures. Lateral and posterior borders narrowly margined changing to sulcate; posterior border with a row of large punctures.

ELYTRA. Convex, elongate, subequal in width with thorax; with acute very poorly developed humeri; glabrous, except for anterior margin, which bears a row of bristles. Striae of each elytron impressed with a number of subequal shallow punctures; interstices twice as wide as striae with a variable number of minute punctures.

LEGS. Middle coxae widely separated. All legs punctulate. Prolateral margin of fore trochanter and femur (4) clothed with long bristles. Fore tibia (4) with proximal half of retrolateral margin bearing two spines, more distal portion with three large acutely curved teeth, each tooth bearing two long bristles; prolateral margin smooth, proximally it bears several long bristles, distally it bears a short, stout spur extending to the distal margin of the second tarsal segment. Hind trochanter (5) with several long bristles. Hind femur (5) with several long bristles along retrolateral margin, prolateral margin glabrous. Hind tibia (5) with four spines along dorsal surface; retrolateral margin straight, bearing six spines; prolateral margin straight, bearing five spines; distal margin with a small prolateral spur and a large spur, the latter variable in length, but usually 2.5 times the length of the small spur and extending 0.9 along the first tarsal segment.

Length, 3.5 mm; breadth, 1.5 mm.

TYPE MATERIAL. Holotype in Muséum National d'Histoire Naturelle Collection, Paris.

MATERIAL EXAMINED. 136 specimens from Auckland; Gisborne; Hamilton; Awatere Valley; Tekapo; Mt. Algidus; Hunua Maketu; Okauia; Rotoiti; Hikurangi Swamp, Whangarei; Christchurch; Nelson; Otewa Gorge, Otorohanga; South Karori, Wellington.

Saprosites exsculptus (White, 1846). Fig. 2: 1-5.

1846. *Oxyomus exsculptus* White, *Zool. Voy. "Erebus and Terror,"* 2: 9.

1861. *Proctophanes exsculptus* (White), Harold, *Berl. Ent. Zeitschr.*, 5: 111.

1876. *Aphodius suspectus* Sharp, *Ent. mon. Mag.*, 13: 70.

1876. *Aphodius pascoei* Sharp, *Ent. mon. Mag.*, 13: 71.

1877. *Saprosites exsculptus* (White), Harold, *Ann. Mus. Stor. Nat. Genova*, 10: 92.

1877. *Saprosites suspectus* (Sharp), Harold, *Ann. Mus. Stor. Nat. Genova*, 10: 92.

1880. *Aphodius exsculptus* (White), Broun, *Man. N.Z. Col.*, 1: 258.

1910. *Saprosites exsculptus* (White), Schmidt, *Genera Insectorum, Fasc. 110*: 112.

1910. *Saprosites exsculptus* (White), Schmidt, *Coleopt. Cat.* 20: 79.

Saprosites exsculptus was originally described by Parry in manuscript form as *Oxyomus exsculptus*, but it was not till 1846 that the first description of the insect was published by White. His description is very short, is unillustrated, and does not contain sufficient information for subsequent identification of the species. In 1861 Harold placed the species *exsculptus* in his new genus *Proctophanes* as *P. exsculptus* (White).

In 1876, Sharp described three new species of *Aphodius* from New Zealand as *A. distans*, *A. suspectus* and *A. pascoei*. He was not sure of their correct generic designation, as he added a footnote saying that though they were allied to the genera *Saprosites*, *Euparia*, and *Ataenius* they did not satisfactorily fit into any of them. However, he considered that they might best be placed in Redtenbacher's genus *Saprosites*. Sharp then referred to *Oxyomus exsculptus* White, which he regarded as closely allied to his three new species. He considered that Harold (1861) had placed it in the wrong genus; so he removed it from *Proctophanes* and placed it in the genus *Aphodius* Illiger. The following year, however, Harold (1877) referred again to the species *Oxyomus exsculptus* now placing it in the genus *Saprosites* Redtenbacher.

In 1880 Broun took Sharp's description of *Aphodius distans* and called it *A. exsculptus* (White), claiming that Sharp's description of *A. distans* corresponded with the type of *A. exsculptus* in the National Collection. He considered that White's description was of little value, no size being given, and could only be applied to the species so long as others were unknown.

In 1910 Schmidt adopted Sharp's (1876) and Harold's (1877) suggestions and placed the species *Aphodius exsculptus* (White), *A. candens* Broun, *A. pascoei* Sharp, and *A. suspectus* Sharp all in the genus *Saprosites*.

In 1958, the type of *Saprosites exsculptus* was examined for the author by Mr. E. B. Britton, of the British Museum (Nat. Hist.), and compared with specimens of *S. suspectus* and *S. pascoei* as identified by Broun. He writes: "With regard to *suspectus* and *pascoei* I can only say that as identified by Broun these are synonymous with *exsculptus*."

Monsieur A. Villiers, of the Muséum National d'Histoire Naturelle, was then approached by the author to examine Sharp's types of *Aphodius distans*, *A. suspectus*, and *A. pascoei*. He replied, "Je crois pouvoir dire que *suspectus* et *pascoei* sont identiques, tandis que *distans* est bien différent." On the basis of this information the author now synonymises *pascoei* with *suspectus*.

Named identical material of *S. exsculptus* from Plant Diseases Division Collection was then sent to both the Paris and British Museums for direct comparison with the types of *distans* and *exsculptus*. Mr. Britton replied that the specimens agreed with the type of *S. exsculptus* (White) and M. Villiers that they agreed with the type of *Aphodius suspectus* Sharp. Consequently the latter may now be sunk in the synonymy of *S. exsculptus* (White).

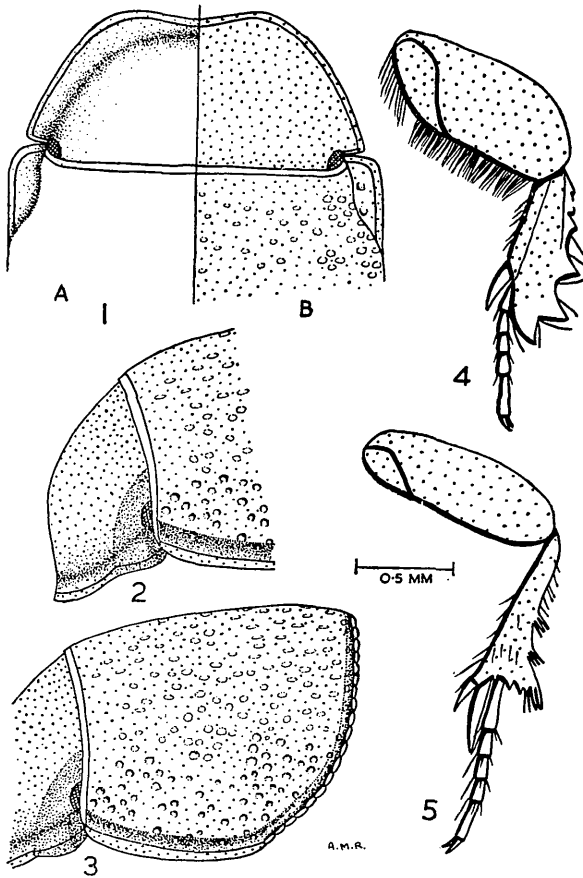


FIG. 2. *Saprosites exsculptus* (White). 1—Dorsal view of head; A, showing shape; B, showing punctation. 2—Lateral view of head. 3—Lateral view of pronotum. 4—Left fore leg. 5—Left hind leg.

Comparison of the named material of *S. exsculptus* with Sharp's description of *Aphodius distans* shows only one point of difference. According to Sharp, "the basal joint of the hind tarsus is as long as the hind spur"; but there appears to be a variability in the length of the hind spur even on the two hind legs of the same insect. Usually it extends to the distal margin of the second tarsal segment, sometimes even further. However, as M. Villiers considers *Aphodius distans* to be different from *S. exsculptus*, the species *exsculptus* is now redescribed in greater detail as follows:

COLOUR. Basic colour medium rufo-ferrugineous; legs rufous.

HEAD. 1, 2. Convex, approximately 2.3 wider than long; densely and evenly punctulate; without clypeal suture; margin of clypeus convex laterally, grooved inside margin, more deeply in front of eyes and disto-medially. Eyes small, not prominent.

PRONOTUM. 3. Convex, approximately 1.7 wider than long; anterior and posterior borders parallel; lateral borders parallel anteriorly, convex posteriorly. Glabrous. Anterior angles rectangular, rounded. Surface densely punctulate, intermingled with a large number of large punctures. Lateral and posterior borders narrowly margined, changing to sulcate; posterior margin crenulate.

ELYTRA. Convex, elongate, slightly narrower than thorax; with obtuse humeri deeply convex anteriorly; glabrous except for anterior margin, which bears a row of bristles. Striae of each elytron deeply impressed with a number of large punctures; interstices twice as wide as striae with a variable number of minute punctures.

LEGS. Middle coxae widely separated. All legs punctulate. Fore trochanter and femur (4) with a row of long bristles along prolateral margin. Fore tibia (4) with proximal half of retrolateral margin bearing three denticles gradually increasing in size distally; distal portion bearing three large, acutely curved teeth; prolateral margin bearing five or six bristles and a short, stout spur at distal end extending to just beyond the distal margin of the first tarsal segment. Hind femur (5) glabrous. Hind tibia (5) bearing five or six prolateral bristles, four or five median ones and approximately twelve retrolateral ones, six of the latter forming two groups of three, one 0.5 and the other 0.25 along the margin from distal end. Distal margin bearing two retrolateral spines and two bristles, three short median spines, a short prolateral spur, and a large spur, the latter 2.2 the length of the small spur and extending to the distal end of the second tarsal segment.

Length, 6 mm; breadth, 3 mm.

TYPE MATERIAL. Holotype in British Museum (Nat. Hist.).

MATERIAL EXAMINED. 114 specimens from Awanui; Mangamuka River, N. Auckland; Auckland; Okauia; Kara, Whangarei; Midhurst, Taranaki; Sinclair Head, Wellington; Mt. Arthur, Nelson; Whangapeka Valley; Titahi Bay, Wellington.

Saprosites distans (Sharp, 1876).

1876. *Aphodius distans* Sharp, *Ent. mon. Mag.*, 13: 70.

1877. *Saprosites distans* (Sharp), Harold, *Ann. Mus. Stor. Nat. Genova*, 10: 92.

1880. *Aphodius exsculptus* (White), Broun, *Man. N.Z. Col.*, 1: 258.

Aphodius distans was described by Sharp in 1876 from material collected in New Zealand and sent to him by Broun. Sharp considered this species to be closely related to *Oxyomus exsculptus* White, but not synonymous with it. The following year Harold (1877) suggested placing *A. distans* in the genus *Saprosites*. In 1880 Broun synonymised *distans* with *exsculptus* as *Aphodius exsculptus*, as he said it had "been found to correspond with the type of *A. exsculptus* in the National Collection."

In 1958 the author wrote to Monsieur A. Villiers, of the Muséum National d'Histoire Naturelle, Paris, asking him if he would kindly compare Sharp's types of *Aphodius distans*, *A. suspectus*, and *A. pascoei*. M. Villiers replied that *suspectus* and *pascoei* were identical, but *distans* was very different. By comparison with the type of *Saprosites exsculptus* in the British Museum (Nat. Hist.) it has been shown that *suspectus* and *pascoei* are synonymous with *exsculptus*. Thus on the basis of M. Villiers' examination, *distans* still remains a valid species, but it will need to be compared with the types of other New Zealand species before this can definitely be confirmed. Because of its similarity to Sharp's other types the author tentatively places it in the genus *Saprosites* Redtenbacher as *S. distans* (Sharp).

TYPE MATERIAL. Holotype in Muséum National d'Histoire Naturelle, Paris.

Saprosites candens (Broun, 1880). Fig. 3: 1-5.

1880. *Aphodius candens* Broun, *Man. N.Z. Col.*, 1: 258-259.

1910. *Saprosites candens* (Broun), Schmidt, *Genera Insectorum, Fasc. 110*: 112.

1910. *Saprosites candens* (Broun), Schmidt, *Coleopt. Cat.* 20: 79.

Aphodius candens was described by Broun, in 1880, from a single specimen collected at Tairua, Thames. Since then no further specimens have been recorded. Broun considered it to be closely allied to *Saprosites exsculptus*. In 1910, when Schmidt revised the Aphodiinae, he placed *A. candens* in the genus *Saprosites*. At the request of the author, Mr. E. B. Britton has compared the types of *Saprosites candens* and *S. exsculptus* (White). He writes, "The type of *Aphodius candens* (Broun) is unique, and this species is distinct from *Saprosites exsculptus* (White). The type of *A. candens* is very small (length 4.4 mm) and is testaceous in colour (no doubt immature). It differs from the type of *S. exsculptus* by having an acute tooth on the elytral shoulder (in *exsculptus* it is obtuse), pronotum slightly more

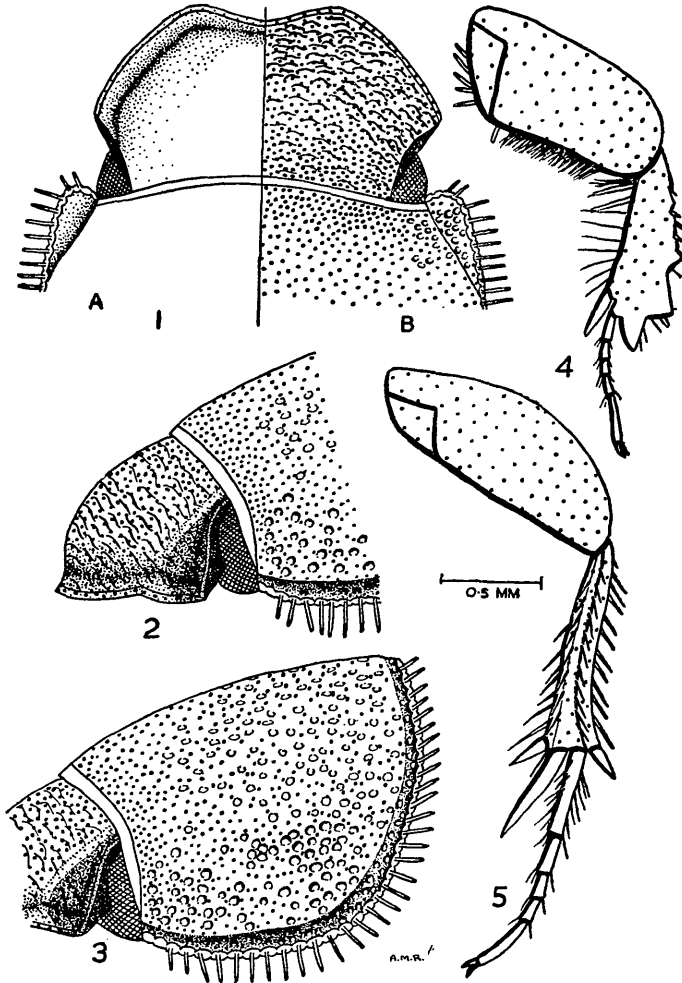


FIG. 3.—*Saprosites rugosus* n.sp. 1—Dorsal view of head; A, showing shape; B, showing punctuation. 2—Lateral view of head. 3—Lateral view of pronotum. 4—Left fore leg. 5—Left hind leg.

transverse and more strongly contracted towards the base (ratio greatest width/width at base = 1.1 compared with 1.03 in the type of *exsculptus*)."

TYPE MATERIAL. Holotype in British Museum (Nat. Hist.) Collection.

Saprosites rugosus n.sp. Fig. 3: 1–5.

COLOUR. Basic colour piceous; distal portion of head, thoracic sternites and legs rufous; anterior border of pronotum testaceous.

HEAD. 1, 2. Convex, approximately twice as wide as long, densely punctate; entire surface wrinkled, those at anterior end deeper. Without clypeal suture; clypeus rather deeply

emarginate distally; grooved inside margin. Eyes large, black, prominent.

PRONOTUM. 3. Convex, approximately 1.5 wider than long; all margins convex. Glabrous except for elongate bristles on lateral and posterior margins. Anterior angles obtuse. Whole surface punctulate, intermingled with larger punctures increasing in size towards lateral and posterior margins. Lateral and posterior borders narrowly margined, crenulate changing to sulcate.

ELYTRA. Convex, elongate, narrower than thorax, with rectangular humeri bearing elongate bristles. Dorsal surface of elytra glabrous. Striae of each elytron impressed with a large number of rather shallow punctures; interstices six times wider than striae and bearing a variable number of minute punctures.

LEGS. Middle coxae widely separated. All legs punctulate. Fore trochanter (4) with a number of long bristles. Proximal margin of fore femur (4) clothed with long bristles. Fore tibia (4) with proximal half of retrolateral margin crenate, bearing four small spines; distal portion bearing three large, acutely curved teeth; proximal margin smooth, clothed with very long bristles and bearing a stout, distal spur, the apex of which extends to just beyond the first tarsal segment. Hind femur (5) glabrous. Hind tibia (5) bearing four longitudinal rows of spines; distal margin bearing a proximal and a retrolateral short spur and a proximal large spur, the latter nearly three times the length of the smaller spurs and extending 0.5 along the second tarsal segment.

Length, 6 mm; breadth, 2.5 mm.

TYPE MATERIAL. Holotype: Mt. Roskill, Auckland, coll. A. E. Brookes, January 1946, and ten paratypes in Plant Diseases Division Collection, Auckland. Four paratypes in British Museum (Nat. Hist.) Collection. Two paratypes in Auckland Institute and Museum Collection.

MATERIAL EXAMINED. 210 specimens from Auckland; Mt. Maunganui; Kaipara Harbour; Gisborne; Russell; Waiheke Island; Okauia; Brooklands.

This species is the largest member of the subfamily Aphodiinae found in New Zealand. It is most closely related to *Saprosites exsculptus* (White), but differs from it in:

1. The row of elongate bristles on the lateral and posterior margins of the pronotum in *S. rugosus* are absent in *S. exsculptus*.
2. The anterior angles of the pronotum obtuse in *S. rugosus*, and rectangular, rounded in *S. exsculptus*.
3. Interstices of elytra six times as wide as striae in *S. rugosus*, and twice as wide as striae in *S. exsculptus*.
4. Hind tibia bearing four longitudinal rows of spines in *S. rugosus*, and three rows in *S. exsculptus*.

Saprosites communis (Broun, 1880). Fig. 4: 1-5.

1880. *Aphodius communis* Broun, *Man. N.Z. Col.*, 1: 260.

1910. *Saprosites communis* (Broun), Schmidt, *Genera Insectorum, Fasc. 110*: 112.

1910. *Saprosites communis* (Broun), Schmidt, *Coleopt. Cat.*, 20: 79.

Aphodius communis was described by Broun in 1880 from specimens he had collected at Tairua and Whangarei. As the beetles were relatively common in both localities he named the species *communis*. In 1910 Schmidt transferred this species to the genus *Saprosites* Redtenbacher, which he had redefined. Broun's description of the species is fairly accurate, although not very detailed; so a fuller description is given as follows:

COLOUR. Basic colour piceous; anterior border of head and legs rufous; anterior border of pronotum testaceous.

HEAD. 1, 2. Convex, approximately twice as wide as long; densely punctulate; margin of clypeus convex laterally, grooved inside margin. Eyes small, not prominent.

PRONOTUM. 3. Convex, approximately 1.4 wider than long, all borders convex. Glabrous. Anterior angle obtuse. Surface densely punctulate, intermingled laterally and posteriorly with large deep punctures. Lateral and posterior borders narrowly margined, changing to sulcate; posterior margin strongly crenulate.

ELYTRA. Convex, elongate, subequal in width with thorax, with acute humeri; glabrous except for anterior margin, which bears a row of bristles. Striae of each elytron impressed with a number of subequidistant large punctures; interstices 1.5 wider than striae with a variable number of minute punctures.

LEGS. Middle coxae widely separated. All legs punctulate. Fore femur (4) glabrous. Fore tibia (4) with proximal half of retrolateral margin crenate, more distal portion bearing three large acutely curved teeth; proximal margin bearing two small spines near distal end and a short, stout spur at distal margin extending to 0.5 along second tarsal segment. Hind femur (5) glabrous. Hind tibia (5) with two diagonal rows of spines consisting of four and

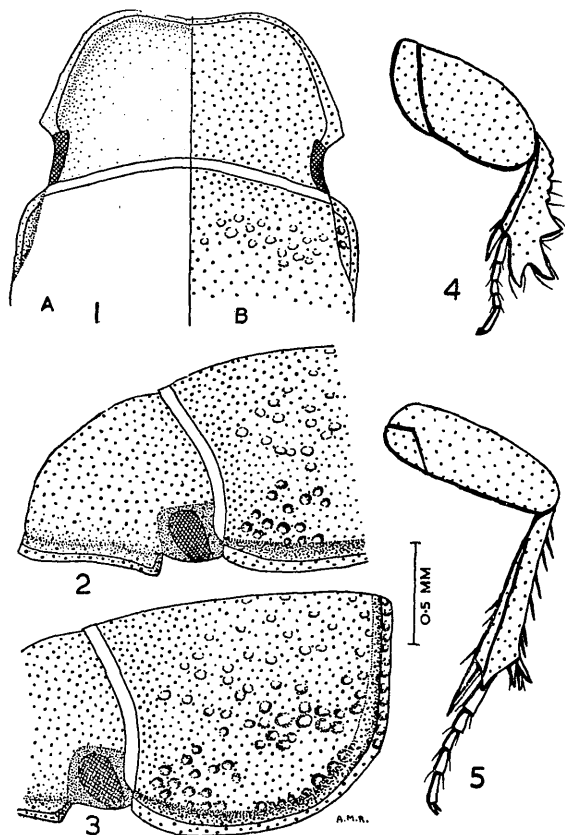


FIG. 4.—*Saprosites communis* (Broun). 1—Dorsal view of head; A, showing shape; B, showing punctuation. 2—Lateral view of head. 3—Lateral view of pronotum. 4—Left fore leg. 5—Left hind leg.

three spines respectively. Retrolateral margin crenate in three unequal sections, the proximal one being 1.8 the length of each of the other two subequal sections; proximal section smooth, convex; median section concave, bearing three spines proximally; distal portion concave, bearing two spines proximally and one spine medianly. Prolateral margin straight, with proximal half smooth and distal half bearing three bristles. Distal margin bears three retrolateral spines, two median spines, a small prolateral spur and a large spur, the latter being 1.5 the length of the small spur and extending 0.66 along the second tarsal segment.

Length, 3.5 mm; breadth, 1 mm.

TYPE MATERIAL. Holotype in British Museum (Nat. Hist.) Collection.

MATERIAL EXAMINED. 150 specimens from Auckland; Mt. Algidus; Hope Arm, Lake Manapouri; Ohakune; Waipu, Whangarei; Featherston; Aroha; Lower Kaimai; Nelson; Great King Island; Wairiri, Kaikoura; Hunua, Maketu; Okauia; Invercargill; Methven; Broken River, Canterbury; Otago; Mokohinau Island; Egmont; Pelorous Bridge, Marlborough; Stephens Island; Coromandel Mts.; Wellington; Eiffelton, Ashburton; Port Hill, Christchurch; Lake Rototiti; Mt. Arthur, Nelson; Pepin Island; Riccarton Bush; Te Waewae Bay, Southland; Riverton Rocks, Southland; Pahia, Southland; Greymouth; Levin.

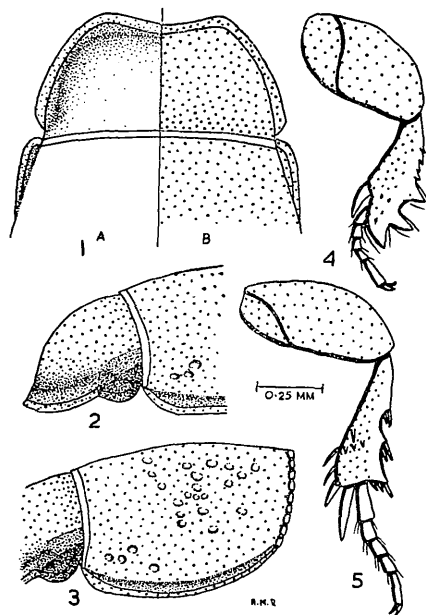


FIG. 5.—*Saprosites fortipes* (Broun). 1—Dorsal view of head; A, showing shape; B, showing punctation. 2—Lateral view of head. 3—Lateral view of pronotum. 4—Left fore leg. 5—Left hind leg.

***Saprosites fortipes* (Broun, 1881). Fig. 5: 1-5.**

1881. *Aphodius fortipes* Broun, *Man. N.Z. Col.*, 4: 954-955.

1910. *Aphodius fortipes* Broun, Schmidt, *Coleopt. Cat.*, 20: 26.

1910. *Aphodius fortipes* Broun, Schmidt, *Genera Insectorum, Fasc. 110*:

This species was collected near Mt. Egmont and described by Broun as *Aphodius fortipes*. It is very closely related to *Saprosites communis* and must now be placed in the genus *Saprosites* Redtenbacher. According to Broun (1881), *S. fortipes* differs from *S. communis* "in having the head much more finely punctated; the coarser punctures on the thorax less numerous and confined to a broad space behind the middle; the punctures in the elytral striae are smaller, so that the striae are not crenate-punctate, as in that species". The first two differences are correct, but I can find little difference in size or shape of the punctures in the elytral striae.

As the types of *S. communis* and *S. fortipes* are both in the British Museum (Nat. Hist.), Mr. E. B. Britton very kindly examined them for the author. He says: "The basal margin of the pronotum in *fortipes* is marked by a row of fine punctures, while in *communis* it is marked by a deep, continuous, punctured groove. In addition the basal edge in *fortipes* is very nearly smooth, whereas in *communis* it is strongly crenulate." These differences agree with the specimens examined by the author and are readily recognisable characters. Thus *S. fortipes* is a valid species.

Broun's (1881) description, although not very full, appears to be quite accurate. However, *S. fortipes* is now redescribed in greater detail as follows:

COLOUR. Basic colour piceous; anterior border of head and legs rufous.

HEAD. 1, 2. Convex, 2.2 wider than long, densely punctulate, punctures deeper and closer together at proximal end; without clypeal suture; margin of clypeus slightly convex laterally, grooved inside margin, more deeply in front of eyes. Eyes very small.

PRONOTUM. 3. Convex, approximately 1.3 wider than long. Anterior and posterior borders truncate, lateral border convex. Glabrous. Anterior angles obtuse. Surface densely punctulate, intermingled medianly with a few large, deep punctures. Lateral border narrowly margined, changing to sulcate. Posterior border slightly crenulate marked by a row of fine punctures.

ELYTRA. Convex, elongate, subequal in width with thorax; with acute, very small humeri; glabrous. Striae of each elytron impressed with a number of subequidistant large punctures; interstices 1.5 wider than striae with a variable number of minute punctures.

LEGS. Middle coxae widely separated. All legs punctulate. Fore femur (4) glabrous. Fore tibia (4) with proximal half of retrolateral margin crenate, more distal portion bearing three large acutely curved teeth, area between two more proximal teeth crenate; prolateral margin smooth, distally it bears a short, stout spur extending almost to the distal margin of the first tarsal segment. Hind femur (5) glabrous. Hind tibia (5) with four spines 0.33 up from distal end; retrolateral margin crenate in three unequal sections, proximal one 1.9 longer than median one, distal one 1.4 longer than median one; proximal portion smooth, slightly convex; median portion concave, bearing two spines proximally; distal portion concave bearing two spines proximally; prolateral margin convex, distal portion bearing three retrolateral spines, a small prolateral spur and a large spur, the latter twice the length of the small spur and extending to the apex of the second tarsal segment.

Length, 3 mm; breadth, 1 mm.

TYPE MATERIAL. Holotype in British Museum (Nat. Hist.) Collection.

MATERIAL EXAMINED. Three specimens A. E. Brookes Collection, locality and date of collection unknown.

Saprosites punctatus n.sp. Fig. 6: 1-5.

COLOUR. Basic colour medium rufo-ferruginous; prothorax and abdominal sternites dark rufo-ferruginous; pronotum testaceous along anterior border; tarsi pale rufo-ferruginous.

HEAD. 1, 2. Convex, broad, approximately twice as wide as long, densely and evenly punctulate; without clypeal suture; margin of clypeus convex laterally grooved inside margin, more deeply in front of eyes. Eyes small, not prominent.

PRONOTUM. 3. Convex, approximately 1.5 wider than long; lateral and posterior borders convex, anterior border concave. Glabrous, except for marginal setae on posterior border. Anterior angles rectangular, rounded. Surface densely punctulate, intermingled posteriorly with a smaller number of larger punctures. Lateral and posterior borders narrowly margined, changing to sulcate; posterior margin crenulate.

ELYTRA. Convex, elongate, subequal in width with thorax; with large acute humeri; glabrous. Striae of each elytron deeply impressed with a number of subequidistant large punctures; interstices as wide as, or wider than striae with a variable number of minute punctures.

LEGS. Middle coxae widely separated. All legs punctulate. Fore femur (4) with long setae along the prolateral margin. Fore tibia (4) with proximal half of retrolateral margin crenate, more distal portion bearing three, large, acutely curved teeth; prolateral margin smooth, bearing a short, stout spur at the distal end, extending to the distal margin of the second tarsal segment. Hind femur (5) glabrous. Hind tibia (5) with retrolateral margin crenate in three subequal sections, the median one being the smallest; proximal portion smooth, convex; median portion concave with two spines at proximal end; distal portion concave with a spine at proximal end; prolateral margin with proximal half smooth, distal half crenate, bearing four spines; distal margin bearing three retrolateral spines, a median spine, a small prolateral spur and a large spur, the latter twice the length of the small spur and extending beyond the second tarsal segment.

Length, 4 mm; breadth, 2 mm.

TYPE MATERIAL. Holotype on decayed apple tree, Remuera, Auckland, coll. K. P. Lamb 20/8/50. Holotype and six paratypes in Plant Diseases Division Collection, Auckland. One paratype in Entomology Division Collection, Nelson. Four paratypes in British Museum (Nat. Hist.) Collection.

MATERIAL EXAMINED. 17 specimens from Auckland.

This species is very closely related to the Australian species *Saprosites mendax* Blackb., but differs from the original description in:

1. The shape of the pronotum being in the proportion 1.3 longer than wide in *S. mendax* and 1.5 wider than long in *S. punctatus*.

2. The anterior angles of the pronotum are obtuse in *S. mendax* and rectangular, rounded in *S. punctatus*.

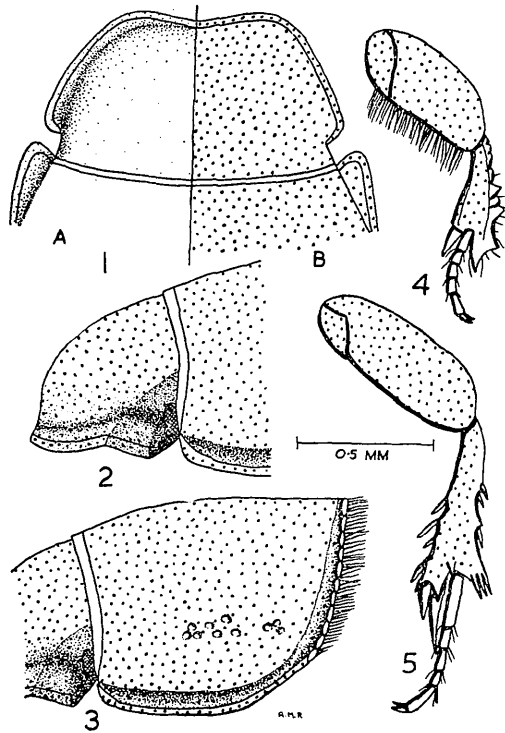


FIG. 6.—*Saprosites punctatus* n.sp. 1—Dorsal view of head; A, showing shape; B, showing punctuation. 2—Lateral view of head. 3—Lateral view of pronotum. 4—Left fore leg. 5—Left hind leg.

3. Posterior angles of the pronotum are obtuse, dentiform in *S. mendax* and obtuse not dentiform in *S. punctatus*.

Saprosites sulcatissimus (Broun, 1911). Fig. 7: 1-5.

1911. *Aphodius sulcatissimus* Broun, *Trans. N.Z. Inst.*, 43: 101.

Saprosites sulcatissimus was described by Broun in 1910 and placed in the genus *Aphodius* Illiger. Upon re-examination the author now transfers it to the genus *Saprosites* Redtenbacher. The type material was collected from Pitt Island, Chatham Islands, but unfortunately appears to be lost. The specimens examined by the author were collected by Mr. E. S. Gourlay in 1944 from the type locality, and they agree fairly closely with the original description. However, they do differ from it in several points. The punctuation of the head is not "minute and distant in front, becoming closer and coarser behind", but rather uniform over the whole head, with a few larger punctures proximally. In each elytron there are nine deep striae, not "six deep dorsal striae" with "the three external ones . . . not so deep". In view of the lack of type material and the placing of the species in a new genus, it was thought advisable to redescribe it as follows:

COLOUR. Basic colour piceous; anterior border of pronotum testaceous; legs rufous.

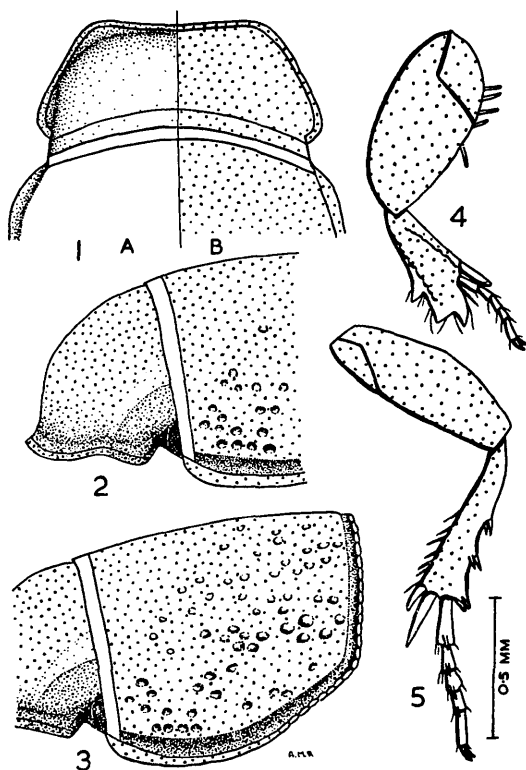


FIG. 7.—*Saprosites sulcatissimus* (Broun). 1—Dorsal view of head; A, showing shape; B, showing punctation. 2—Lateral view of head. 3—Lateral view of pronotum. 4—Right fore leg. 5—Left hind leg.

HEAD. 1, 2. Convex, approximately 2.6 wider than long, densely punctulate; with clypeal suture. Clypeus grooved inside margin. Eyes small.

PRONOTUM. 3. Convex, approximately 1.6 wider than long; anterior border truncate, lateral and posterior borders convex. Glabrous. Anterior angles obtuse. Whole surface punctulate, intermingled laterally and posteriorly with large, deep punctures. Lateral and posterior borders with narrow margins changing to sulcate, more deeply laterally than posteriorly; postero-lateral and posterior margins crenulate.

ELYTRA. Convex, elongate subequal in width with pronotum; with acutely prominent spiniform humeri. Dorsal surface of elytra glabrous. Striae of each elytron deeply impressed with a number of widely spaced punctures. Interstices subequal in width with striae, and bearing a variable number of minute punctures.

LEGS. All legs punctulate. Fore trochanter and femur (4) with several long bristles on prolateral margin. Fore tibia (4) with a prolateral and retrolateral crenate ridge; proximal half of retrolateral margin smooth; distal portion bearing three large acutely curved teeth; prolateral margin smooth, glabrous, bearing a stout distal spur, the apex of which extends to 0.5 along the second tarsal segment. Hind femur (5) glabrous. Hind tibia (5) with retrolateral margin crenate in three sections, the proximal one equal in length with the other two together, the median and distal ones subequal in length. The proximal and median sections bear two spines and the distal section four spines at their distal ends; prolateral margin bearing seven spines along more distal half; prolateral distal margin with a short spur and a large

spur, the latter twice the length of the small spur and extending 0.5 along the second tarsal segment.

Length, 4 mm; breadth, 2 mm.

TYPE MATERIAL. Broun's type material appears to be lost. The species has been re-described by the author from material collected by Mr. E. S. Gourlay from the type locality on Pitt Island, Chatham Islands. Consequently the author feels at liberty to select one of these specimens and designate it a neotype and make the other three specimens topotypes. Neotype and two topotypes in E. S. Gourlay Collection. One topotype in Auckland Institute and Museum Collection.

MATERIAL EXAMINED. 4 specimens from Pitt Island, Chatham Islands.

Saprosites raoulensis (Broun, 1910). Fig. 8: 1-5.

1910. *Aphodius raoulensis* Broun, *Trans. N.Z. Inst.*, 42: 295.

Aphodius raoulensis was described by Broun in 1910 from material collected on Raoul Island, Kermadec Islands. Examination of the type has necessitated placing the species *raoulensis* in the genus *Saprosites* Redtenbacher.

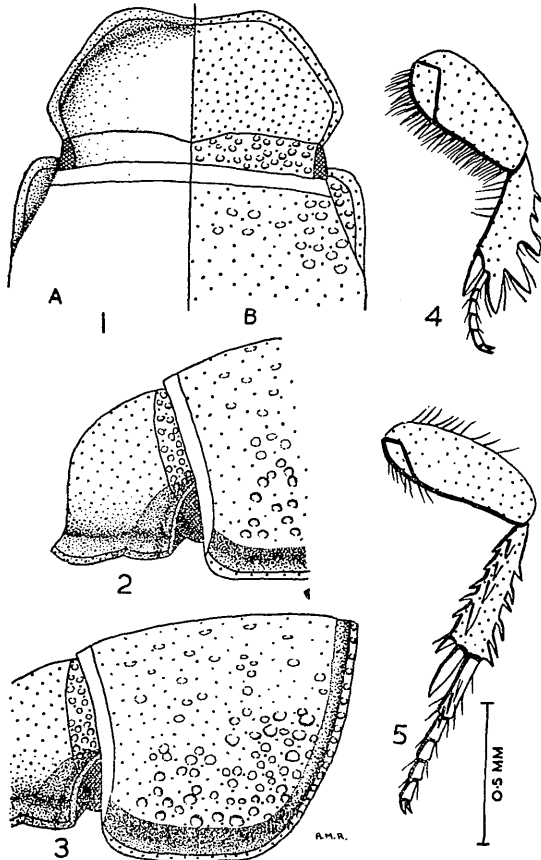


FIG. 8.—*Saprosites raoulensis* (Broun). 1—Dorsal view of head; A, showing shape; B, showing punctation. 2—Lateral view of head. 3—Lateral view of pronotum. 4—Left fore leg. 5—Left hind leg.

Comparison of the type with Broun's description has shown that it differs from it in several points. He considers that the anterior part of the head is indistinctly punctured, whereas the whole surface of the head is closely punctulate. He describes the thorax as "a fifth broader than long, subquadrate", whereas the author's measurements show it to be 1.4 wider than long. The posterior angle of the thorax he records as rectangular, while the author considers it obtuse. The punctulation of the thorax Broun considers to be "much finer than those on the head", but to the author they appear similar in size. Finally Broun records the proximal segment of the posterior tarsus as "hardly as long as the terminal tibial spurs", but in the holotype the tibial spur extends to 0.5 along the second tarsal segment. Because of these variations, the author has redescribed the species as follows:

COLOUR. Basic colour piceous; anterior border of pronotum testaceous; legs rufous.

HEAD. 1, 2. Convex, approximately twice as wide as long; closely punctulate, without clypeal suture; margin of clypeus convex laterally, grooved inside margin, more deeply medianly. Eyes large, prominent.

PRONOTUM. 3. Convex, approximately 1.4 wider than long; anterior and lateral borders convex, truncate posteriorly. Glabrous. Anterior angles obtuse. Whole surface punctulate intermingled with large, deep punctures. Lateral and posterior borders with narrow margins changing to sulcate, more deeply laterally than posteriorly; posterior margin deeply punctate.

ELYTRA. Convex, elongate, subequal in width with pronotum; with rectangular, rounded humeri. Dorsal surface of elytra glabrous. Striae of each elytron deeply impressed with a large number of punctures; interstices subequal in width with striae and covered with numerous punctures.

LEGS. All legs punctulate. Fore trochanter and femur (4) glabrous. Fore tibia (4) with proximal half of retrolateral margin crenate, bearing three bristles; distal portion bearing three large acutely curved teeth; prolateral margin glabrous, smooth, bearing a stout spur distally, the tip of which extends to just beyond the first tarsal segment. Hind femur (5) glabrous. Hind tibia (5) with three prolateral and seven retrolateral bristles; retrolateral distal margin with three spurs and two bristles, prolateral distal margin with a short spur and a large spur, the latter 1.6 the length of the small spur and extending 0.5 along the second tarsal segment.

Length, 5.5 mm; breadth, 2.5 mm.

TYPE MATERIAL. Holotype in Auckland Institute and Museum Collection. Found under rotten logs Raoul (Sunday) Island (type locality), coll. Mr. Wallace; no date.

MATERIAL EXAMINED. 2 specimens from Raoul Island in Kermadec Islands.

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