

KEYS TO GENERA AND SOME SPECIES OF NEW ZEALAND LATHRIDIIDAE (COLEOPTERA)

J. C. WATT,

Entomology Division, D.S.I.R., Nelson.

SUMMARY

A key to genera of Lathridiidae (including Merophysiidae) known to occur in New Zealand is presented. These are **Holoparamecus**, **Enicmus**, **Lathridius**, **Microgramme**, **Adistemia**, **Cartodere**, **Aridius**, **Metophthalmus**, **Corticaria**, **Melanophthalma** sens. lat., and **Rethusus**. **Diarthrocer**a is synonymised with **Corticaria**. Partial or complete keys to species are presented in all genera except **Melanophthalma**. The information will enable identification of all species of Lathridiidae recorded from New Zealand on crops, pastures or stored products. New synonymy, recombinations and new distribution records are noted.

INTRODUCTION

Lathridiidae are small beetles, which may be recognised in the New Zealand fauna by the following combination of characters: Size small, 1-3 mm long. All tarsi genuinely 3-segmented (not pseudo-trimerous with second segment lobed and third segment small and fused with base of fourth) or 2-3-3 in some males. Elytra completely cover abdomen.

Crowson (1955) split off the Merophysiinae, including **Holoparamecus**, as a separate family. While there is much to be said in favour of a family Merophysiidae, the majority of genera of both Merophysiinae and Lathridiinae are inadequately studied, especially as larvae, and as poorly known forms may partly bridge the gap between the two groups, I have followed the traditional classification for the present.

Hinton (1941) records 30 Lathridiidae associated with stored products. Others are found on crops, pastures, on or in fungi, in decaying vegetable matter such as haystack refuse and leaf litter, or on the foliage of trees and shrubs. In all cases where the biology is known, both adults and larvae feed on moulds. Thus, Lathridiidae may be partly responsible for the dissemination of fungal spores, but are unlikely to be of any great economic importance. Their presence in stored products is almost always associated with the presence of moulds.

In the most recent list of New Zealand beetles (Hudson, 1934), 57 specific names are included under Lathridiidae. The genus **Myrmecoxenus** (1 sp. N.Z.) belongs in Colydiidae, and **Monotoma** (3 spp. N.Z.) should be placed in Rhizophagidae. The species included by Broun in **Lathridius** are distributed below in several genera. All the native species listed under **Corticaria** except **C. melasoma** belong in **Melanophthalma** sens. lat. Many of these changes were made by Belon (1884, 1897) but his work was completely ignored by Broun, and apparently unknown to Hudson, who listed only the species included in Broun's publications.

In this paper a key to genera occurring in New Zealand is presented, together with partial or complete keys to species except in **Melanophthalma**. Synonymy where known has been noted. The keys will enable identification of all species likely to be encountered on improved pastures, crops or stored products in New Zealand. The large number of native species in the genera **Enicmus** and **Melanophthalma** require much further study before complete keys to them can be constructed, and it is likely to be several, perhaps many, years before a reasonably complete revision of New Zealand Lathridiidae can be published. It was thus felt desirable to publish the present paper now, in order to make the information on the species of economic importance generally available, and to permit identification of all New Zealand Lathridiidae to genus at least. Similar papers on other families of New Zealand Coleoptera are planned, and a key to families is being prepared.

In the tribe Lathridiini I have followed the generic nomenclature and classification of Walkley (1952). While this clearly conflicts with previous customary usage in Europe, it as clearly agrees with the mandatory provisions of the International Code of Zoological Nomenclature. It is regrettable that Peez (in Freude, Harde and Lhose, 1967), in an otherwise excellent study, has used the traditional European nomenclature, rather than strictly following priority as Walkley has done.

The first elytral stria is nearest the suture. In counting elytral intervals, the space between the suture and the first stria is the first elytral interval.

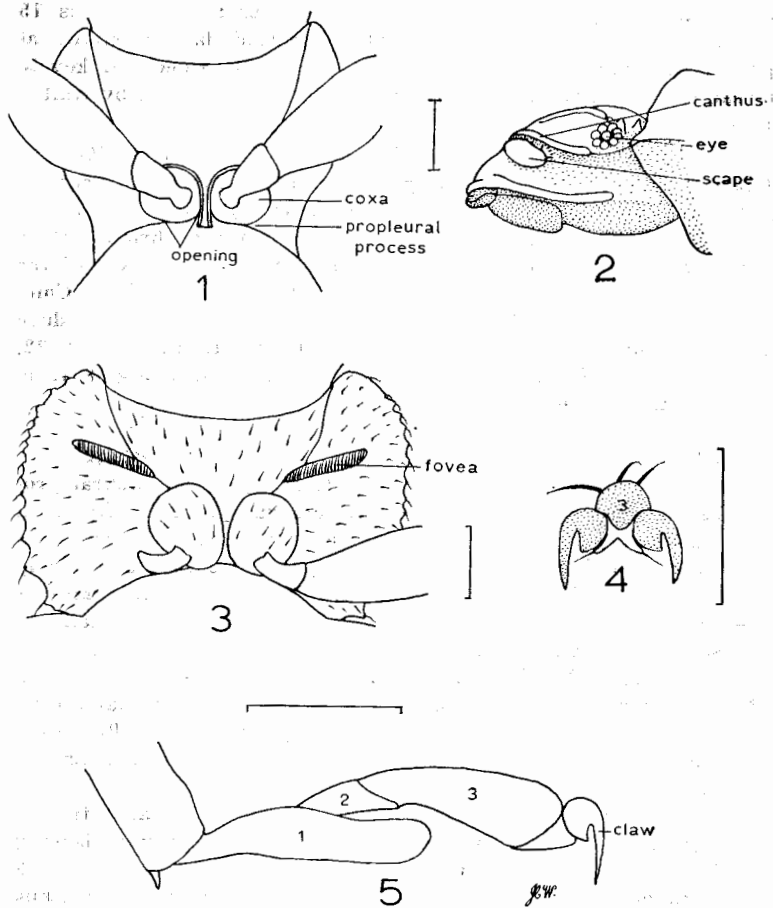
Lists of literature under non-endemic genera and species include only the original description, recent descriptions that add

materially to knowledge of the taxon, and all references recording occurrences in New Zealand. Full bibliographies and synonymies up to 1925 may be found in Junk, *Coleopterorum Catalogus* 15 (85). Too few larvae of New Zealand Lathridiidae are known at present to enable useful keys to them to be published. A key to larvae of species associated with stored products is given by Hinton (1941).

I am indebted to Mr. R. D. Pope of the British Museum (Natural History) for informing me of the synonymy and correct generic position of *Cartodere castanea* (Broun), *Corticaria formicaephila* (Broun) and *C. longula* Broun, and for confirming other synonymy suggested by me. I wish to thank the Secretary of the Commonwealth Agricultural Bureaux and the Director of the Commonwealth Institute of Entomology for permission to reproduce figures 6 and 7 from *Bulletin of Entomological Research*, Vol. 32, and to Dr. M. H. Hatch for permission to reproduce Fig. 8 from "The Beetles of the Pacific Northwest", Vol. 3.

KEY TO GENERA OF NEW ZEALAND LATHRIDIIDAE

1. Front coxal cavities open behind (fig. 1), i.e. propleural processes not reaching prosternal intercoxal process. Antennal club 3-segmented, with last 2 segments greatly enlarged and closely applied (partly fused in male), and excavate ventrally (SUBFAMILY MEROPHYSIINAE) - - **Holoparamecus**
- Front coxal cavities closed behind. Antennal club usually 3-segmented, but all segments distinct and convex ventrally (SUBFAMILY LATHRIDIINAE) - - - - - 2
2. Body glabrous or almost so. Clypeus on lower plane than frons and fronto-clypeal suture deeply impressed. Pronotum and/or elytra frequently costate or carinate (Tribe Lathridiini - - - - - 3
- Body pubescent. Clypeus and frons on same plane, fronto-clypeal suture not deeply impressed. Costae or carinae lacking from pronotum and elytra (Tribe Corticariini) - - - - - 9
3. Eyes dorso-lateral in position, situated above lateral canthus (fig. 2), composed of no more than 11 facets. Elytra fused along suture, each with 2 prominent carinae (excluding epipleural carina) and 6 rows of punctures (fig. 7). Dorsal surface covered with a waxy exudate in nature - **Metophthalmus**
- Eyes lateral in position, situated partly below level of canthus, rarely small. Elytra not fused along suture, each with 0, 1, 2 (**Adistemia**) or 3 carinae or costae, and 8 rows of punctures (fig. 6). Dorsal surface not covered with waxy exudate. - 4
4. Each elytron with 2 prominent longitudinal carinae (on 3rd and 7th intervals). Metasternum and first abdominal sternite fused between hind coxae, suture between them absent. Front coxae contiguous. Body very slender - - - **Adistemia**



(Figs. 1-5) Scale line = 0.1 mm.

Fig. 1: *Holoparamesus tenuis*, prothorax ventral view.

Fig. 2: *Metophtalmus sinuosus*, lateral view of head, scape only of antennae shown.

Fig. 3: *Corticaria elongata*, prothorax, ventral view.

Fig. 4: *Rethusus pustulosus*, end of left middle tarsus, showing appendiculate claws.

Fig. 5: *Rethusus pustulosus*, lateral view (from behind) of right middle tarsus—setae omitted.

- Elytral carinae if present are on 3rd, 5th and 7th intervals or on 7th interval only. Metasternum and first abdominal sternite not fused, suture between them distinct. Front coxae separated. Body not very slender - - - - - 5
5. Prosternal intercoxal process keeled and elevated to, or above, level of apices of anterior coxae. Ventral surface of body without waxy exudate. Prothorax with rounded or straight sides, without deep indentations - - - - - **Enicmus**
- Prosternal intercoxal process not keeled. Ventral surface of body partly or completely covered with waxy exudate in nature. Prothorax usually deeply indented laterally - - - - - 6
6. Eyes small, consisting of few facets. Pronotum without costae. Elytra regularly elongate oval, 7th elytral interval not costate at base, with strongly raised transverse carina at base, shoulders obsolete - - - - - **Microgramme**
- Eyes large, consisting of many facets. Pronotum with distinct longitudinal costae or carinae, at least near base. Elytra oblong oval; 7th elytral interval costate at base; without a strongly raised transverse carina at base; shoulders prominent - - - - - 7

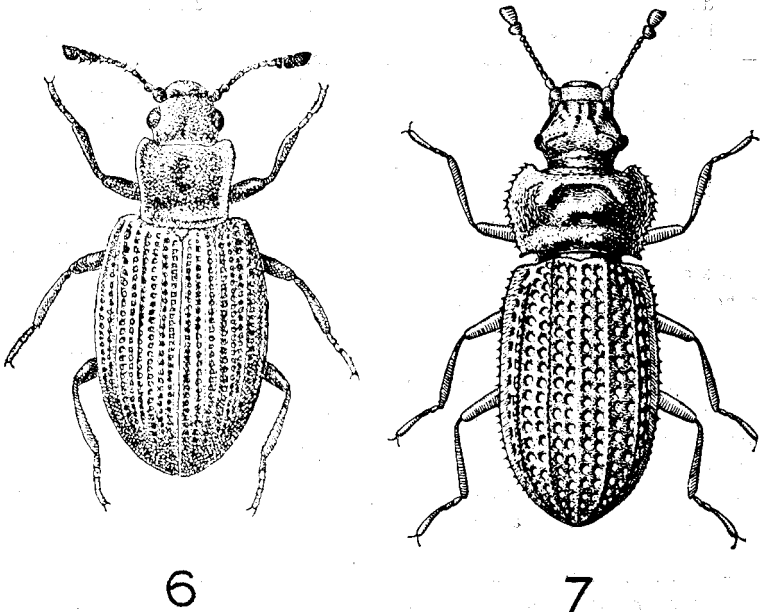


Fig. 6: *Lathridius minutus* (Length 1.2 - 2.4 mm)—from Hinton, 1941.

Fig. 7: *Metophtalmus serripennis* (Length 1.1 - 1.4 mm)—from Hinton, 1941.

7. Prothorax approximately quadrate, without lateral indentations (fig. 6). Metathorax with deep pits immediately behind middle coxae - - - - - **Lathridius**
 —Prothorax different, with deep indentations on each side near base (fig. 8). Metathorax without deep pits - - - - - 8
8. Antennal segments 3 to 8 little longer than broad, antennal club 2-segmented. Temples parallel and appearing at least as long as eyes - - - - - **Cartodere**
 —Antennal segments 3 to 8 much longer than broad, antennal club 3-segmented. Temples somewhat convergent and not appearing as long as eyes - - - - - **Aridius**
9. Tarsal claws appendiculate (fig. 4). Base of 2nd tarsal segment inserted on dorsal surface of basal segment at about its mid-length (fig. 5). Pronotum and elytra with numerous shining gibbosities and tubercles - - - - - **Rethusus**
 —Tarsal claws simple. Base of second tarsal segment inserted at apex of first segment. Elytra and usually prothorax without prominent gibbosities and tubercles - - - - - 10
10. Prothorax with a distinct transverse pubescent fovea obliquely anterior to front coxae (fig. 3). Sides of prothorax distinctly dentate, especially towards base (fig. 3). Scutellum strongly transverse, with transverse carina - - - - - **Corticaria**
 —Prothorax without such foveae. Sides of prothorax not dentate, rarely minutely denticulate. Scutellum less transverse, without transverse carina - - - - - **Melanophthalma**

Holoparamecus Curtis, 1833

Curtis, 1833, **Ent. Mag.** 1: 186.

Belon, 1897, **Revue Ent.** 16: 110, 120.

This genus contains a number of species sometimes associated with stored products, including **H. caularum** (Aubé), which is stated to be cosmopolitan (Hinton, 1941), but has not been recorded from New Zealand, and is not represented in the material studied by me. The latter includes one described species (**H. tenuis**), and two undescribed species. No specimens agree with the description of **H. castaneus** Broun, so it appears that there are at least 4 species of this genus in New Zealand. The two described species may be separated thus.

1. Fronto-clypeal suture "almost quite straight". Prothorax "rather longer than broad". Moko Hinau Id.

castaneus Broun, 1893.

- Fronto-clypeal suture distinctly curved. Prothorax slightly broader than long - (**lucidus** Broun, 1880) **tenuis** Reitter, 1879.

H. tenuis occurs occasionally in leaf litter. Its range extends from the Three Kings Islands to Canterbury. The other species all seem to be confined to the north of the North Island, where they also inhabit leaf litter.

Enicmus Thomson, 1859

Thomson, 1859, Skand. Coleopt. 1: 93.

Belon, 1897, *Revue Ent.* 16: 114, 131.

Walkley, 1952, *Proc. ent. Soc. Wash.* 54: 218, 219.

Most of the species described by Broun in **Lathridius** belong in this genus, as indicated by Belon (1897). Only **caviceps** is represented by authentically named material in New Zealand collections, and it has not been possible to determine the 4 species grouped in couplet 3, as the characters which separate species are either not mentioned in the descriptions, or are described in insufficient detail.

Enicmus sensu Walkley corresponds with subgenus **Enicmus** sensu Belon, but all the indigenous New Zealand species which I have seen belong in **Enicmus** sensu strictu rather than the other "subgenus" **Conithassa** (=Lathridius).

In all other genera of Lathridiini occurring in New Zealand, at least traces of a waxy exudate are present ventrally, but this is absent in **Enicmus**. Little is known of the biology of the New Zealand species, which have been collected from leaf litter or by beating vegetation.

1. Metasternum with a deep, very steep-sided fovea on the anterior intercoxal process - - - - - 3
—Metasternum without a median fovea - - - - - 2
2. Metasternum without deep depressions immediately behind middle coxae. Elytra broadly oval, elytral intervals convex, with intervals 3 and 5 costate posteriorly and interval 7 costate throughout. Prothorax transverse with rounded sides.
- - - - - **caviceps** (Broun, 1893)
—Metasternum with deep depressions immediately behind middle coxae. Elytra elongate oval, elytral intervals scarcely convex, not costate. Prothorax cordate - **foveatus** (Belon, 1884)
3. Lateral elytral carina (epipleural carina) with 5-6 sharp, backwardly directed teeth on shoulder.
- - - - - **priopterus** (Broun, 1886)
—Epipleural carina not dentate - - **bifoveatus** (Broun, 1886), **puncticeps** (Broun, 1886), **ruffrons** (Broun, 1914), **sharpi** Belon, 1884.

Lathridius Herbst, 1793, emend. Illiger, 1801.

Herbst, 1793 in Jablonsky, Nat. Ins. Käfer 5: 3, 10 (**Lathridius**).

Illiger, 1801, Mag. Ins. 1: 140 (Emend. pro **Lathridius**).

Walkley, 1952, *Proc. ent. Soc. Wash.* 54: 219, 223.

Conithassa Thomson, 1859, Skand, Coleopt. 1: 93.

As noted by Walkley, this genus is not particularly closely related to **Enicmus** (with which, under the name **Conithassa**, it was often included as a subgenus), all true species of which have the prominent keeled prosternal process mentioned in the generic key, and lack waxy exudate. Only one species is known to occur in New Zealand.

Lathridius minutus (Linnaeus, 1767)

Linnaeus, 1767, *Syst. Nat.*, Ed. 12: 675 (**Tenebrio**).

Reitter, 1879, *Verhandl. naturf. Ver. Brünn* 18: 179 (**Enicmus**).

Hinton, 1941, *Bull. ent. Res.* 32: 195, 214, figs. 16-23.

(**Enicmus**).

Walkley, 1952, *Proc. ent. Soc. Wash.* 54: 224, 226 (**Lathridius**).

sulcifrons Broun, 1895, *Ann. Mag. nat. Hist.* (6) 15: 196 (**Lathridius**) *n. syn.*

Belon, 1897, *Revue Ent.* 16: 179 (**Enicmus**).

This species was first recorded from New Zealand by Reitter in 1879 (loc. cit.), and later by Broun (loc. cit.) from West Plains, Southland, under the name **sulcifrons**. Two probable syntypes of the latter in Entomology Division agree well with **L. minutus**, and this synonymy has been confirmed by Mr. R. D. Pope (in litt.). There are also 4 specimens from Wellington, 6 July, 1946, on mouldy wallpaper, and 4 from Moa Hut, 20 Oct. and 7 Nov. 13, leaf mould, Broun Coll. Hinton (1941) records it in Europe in buildings from mouldy household articles and stored products; and outdoors from moss, bird and mammal nests, polypore fungi and haystack debris; and describes larva and pupa.

Microgramme Walkley, 1948

Walkley, 1948, *Proc. ent. Soc. Wash.* 50: 150.

—, 1952, *Proc. ent. Soc. Wash.* 54: 219, 222.

This genus was established by Walkley for species previously placed in **Cartodere** of authors, not Thompson, 1859. In some species the elytra have only 6 or 7 rows of punctures, but in the only species known to occur in New Zealand there are 8 rows of elytral punctures.

Microgramme ruficollis (Marsham, 1802)

Marsham, 1802, *Ent. Brit.* 111 (**Lathridius**).

Hinton, 1941, *Bull. ent. Res.* 32: 196, 233 (**Cartodere**).

Hatch, 1962, *Univ. Wash. Publs* 16, 3: 119 (**Microgramme**).

Gourlay, 1964, *N.Z. Ent.* 3, 3: 46 (**Cartodere**).

First recorded by Gourlay (loc. cit.) from New Zealand, this species does not seem to have been recollected here, but is almost certainly well established. The original specimens were abundant in baled grass hay in a barn at Orinoco, Nelson, on 28 May, 1962. Overseas, **M. ruficollis** has been recorded frequently from haystack refuse, and occasionally from flour, grain and mouldy paper in houses and other buildings (Hinton, 1941).

Adistemia Fall, 1899

Fall, 1899, *Trans. Amer. ent. Soc.* **26**: 113, 141.

Belon, 1902, *Gen. Ins.* **3**: 25.

Hinton, 1941, *Bull. ent. Res.* **32**: 176.

There are 3 known species in this genus, one from Chile, another from Peru, and the third, *A. watsoni*, recorded from Europe, Africa, North and South America, and now New Zealand. The genus is readily distinguished by the fused metasternum and first abdominal sternite, small eyes, elongate head and contiguous front coxae. Males have the tarsal formula 2-3-3.

Adistemia watsoni (Wollaston, 1871)

Wollaston, 1871, *Trans. ent. Soc. Lond.* **1871**: 253 (*Latridius*).

Hinton, 1941, *Bull. ent. Res.* **32**: 195, 220, figs. 26-33.

The record from New Zealand of this species is based on a single specimen found in material extracted from a mat plant and moss sample by Dr. G. Kuschel. The sample was collected on Campbell Island (Puisseaux Peak, 270 m., 21 Jan., 1969), and brought to the mainland for extraction at Nelson, via Lyttelton and Christchurch. The species is recorded mainly from warm countries, and is known only indoors in cool temperate climates. Thus it is unlikely that the specimen originated on Campbell Island, and it probably entered the sample on the mainland. *A. watsoni* has been found in buildings in a variety of stored products, and has been reared on moulds and spores of Mycetoza (Hinton, 1941).

Cartodere Thompson, 1859

Thomson, 1859, *Skand. Coleopt.* **1**: 93.

Walkley, 1952, *Proc. ent. Soc. Wash.* **54**: 219, 233.

This genus is the true *Cartodere* (type species *Latridius constrictus* Gyllenhal, 1827), and was usually treated as part of the old genus *Coninomus*. It appears to be closely related to *Aridius*, from which it is distinguished by its 2-segmented antennal club and well developed temples.

Cartodere castanea (Broun, 1886) *comb. nov.*

Broun, 1886, *Man. N.Z. Col.* **4**: 834. (*Lathridius*).

apicalis Blackburn, 1888, *Trans. R. Soc. S. Aust.* **10**: 204. (*Lathridius*) *n. syn.*

Mr. R. D. Pope writes (30 Jan., 1969, in litt.) that *castanea* (which I had referred tentatively to *Aridius* on the basis of Broun's inadequate description) belongs in *Cartodere* because of its 2-segmented antennal club and head structure, and that *apicalis* is a synonym. I have seen no specimens, and the species is apparently known from New Zealand only from Broun's original type in the British Museum. This is "one mutilated individual, taken on the Waitakerei Range." *Lathridius apicalis* was described from Port Lincoln, South Australia.

Aridius Motschulsky, 1866

Motschulsky, 1866, **Bull. Soc. Imp. Nat. Mosc.** 39: 260.

Walkley, 1948, **Proc. ent. Soc. Wash.** 50: 150.

—, 1952, **Proc. ent. Soc. Wash.** 54: 219, 234.

Aridionomus Reitter, 1911, **Fauna German.** 3: 18, 82.

Probably no species of this genus are indigenous to New Zealand. All have waxy secretion on the sides of the prothorax which appears like a translucent margin in dorsal view. This is sometimes lacking in mounted specimens, especially if they have been cleaned with organic solvents. The species known from New Zealand may be distinguished as follows.

1. Elytra unicolorous, light to dark brown. Elytral intervals 3, 5 and 7 costate - - - - - 2
—Elytra yellowish to testaceous, with 2 or 4 dark brown to black spots on each. Elytral intervals except base of 7 not costate.
- - - - - **bifasciatus**
2. Third elytral interval evenly costate from base almost to apex. Elytral surface fairly even, without pronounced depressions.
- - - - - **costatus**
—Third elytral interval distinctly costate near base, then less distinctly so behind to top of hind slope, where there is a large, prominent, rounded, longitudinal gibbosity. Elytral surface with pronounced transverse depressions, general appearance hummocky - - - - - **nodifer**

Aridius nodifer (Westwood, 1839)

Westwood, 1839, **Introd. Mod. Class. Ins.** 1: 155, figs. 13, 23 (**Lathridius**).

Belon, 1884, **Revue Ent.** 3: 250 (**Lathridius**)

Hinton, 1941, **Bull. ent. Res.** 32: 206-210, figs. 5-13 (**Coninomus**).

Walkley, 1952, **Proc. ent. Soc. Wash.** 54: 235 (**Aridius**).

antipodus White, 1846, **Voy. Ereb. Terr. Ins.** 18 (**Lathridius**).

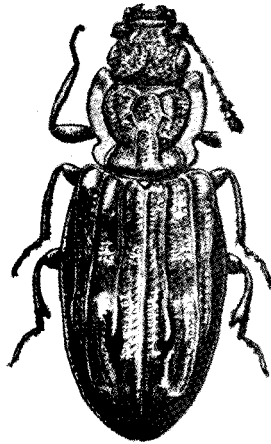
Broun, 1880, **Man. N.Z. Col.** 1: 233 (**Lathridius**).

—1886, **Man. N.Z. Col.** 4: 834 (**Lathridius**).

marginalis Broun, 1880, **Man. N.Z. Col.** 1: 233 (**Lathridius**) n. syn.

sculpturatus Broun, 1880, **Man. N.Z. Col.** 1: 233 (**Lathridius**).

The distribution of this species is virtually cosmopolitan. It has been recorded from a wide variety of mouldy vegetable products in Europe, and has been cultured on moulds growing on bread and cheese (Hinton, 1941). It was first recorded from New Zealand in 1846 by White (loc. cit.), under the name **Lathridius antipodus**. There are specimens in Entomology Division from Takapuna, Okauia, Opotiki, Tararua Ra., Nelson, Baton Vall., Kaihoka Lakes, Pelorus Bridge. Puhī Puhī Res. (Kaikoura), and Kaiangaroa and Limestone Quarry (Chatham Island). Most specimens were found in leaf litter, moss, or dead branches in native forest. There were few European settlements in New Zealand before 1846,



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Fig. 8: *Aridius nodifer* (Length 1.5 - 2.1 mm)—from Hatch, 1962.

and the species occurs widely in native habitats, so this raises the question of whether it was artificially introduced, or occurred here naturally before human occupation, or at least before the arrival of Europeans. While *A. nodifer* is said to be "cosmopolitan", the only published record I can find from Pacific islands concerns the Hawaiian group. The species is occasionally associated with stored products, so would be easily carried on a ship to New Zealand, possibly by one of the early explorers, sealers or whalers. Thus it seems most likely that *A. nodifer* was artificially introduced into New Zealand.

***Aridius costatus* (Erichson, 1842) comb. nov.**

Erichson, 1842, *Arch. Naturg.* 8: 242 (*Lathridius*).

Belon, 1884, *Revue Ent.* 3: 251 (*Lathridius*).

***costulatus* Broun, 1880, *Man. N.Z. Col.* 1: 235 (*Lathridius*).**

This species was originally described from Tasmania, and does not seem to have been recorded from the Australian mainland (at least under the name *costatus*). There are specimens in Entomology Division from Katikati, Boatmans (Reefton), Howard, Moa Basin, Dicks, Dipton and West Plains (Southland), from litter and moss.

***Aridius bifasciatus* (Reitter, 1877) comb. nov.**

Reitter, 1887, *Mitt. münch. ent. Ver.* 1: 138 (*Coninomus*).

Hinton, 1941, *Bull. ent. Res.* 32: 194, 205 (*Coninomus*).

Allen, 1951, *Ent. mon. Mag.* 87: 114 (*Lathridius*).

***dualis* Broun, 1914, *Bull. N.Z. Inst.* 1: 181 (*Lathridius*) n. syn.**

This Australian species was first recorded from New Zealand by Broun (loc. cit.), under the name **dualis**. He mentions several specimens from McClennan's Bush, Ardagh and Methven, collected by T. Hall. There are specimens in Entomology Division from Nelson, Karamea, Lincoln, Kaituna (Banks Peninsula), Kaingaroa and Waitangi (Chatham Island), and Pitt Island, in addition to the specimens recorded by Cumber (1959 : 767) from pasture, and by Eyles (1961 : 135) from fodder crops in the North Island. The species is most frequently encountered on exotic crops, grass or rushes, and is rarely found in native habitats, where it has been found on flowering shrubs, in moss and in leaf litter.

A. bifasciatus has become established in England, where it was first recorded by Allen (loc. cit.), being usually collected by sweep-net grass. Nothing seems to be recorded of its biology or distribution in Australia.

Metophthalmus Wollaston, 1854

Wollaston, 1854, Ins. Mader.: 192.

Hinton, 1941, **Bull. ent. Res.** 32: 176.

Lithostygnus Broun, 1886, Man. N.Z. Col. 4: 950.

Hinton (loc. cit.) synonymised **Lithostygnus** with **Metophthalmus**. I have reservations about this synonymy, but the status of **Lithostygnus** would need to be considered as part of a comprehensive review of **Metophthalmus** and related genera. **Lithostygnus** was originally placed by Broun in Colydiidae, but was later correctly transferred to Lathridiidae.

Adults are covered dorsally and ventrally with a waxy exudate, which must be removed, at least dorsally, before specific identification is attempted. Cleaning is best effected with an organic solvent such as xylene. Clean the specimen superficially, then mount on a card point with a water-soluble adhesive and allow to dry for a few days. The point plus specimen may then be placed in xylene, allowed to soak for a few minutes, and then cleaned carefully with a fine dissecting needle.

The New Zealand **Metophthalmus** fall into 3 distinct groups, one of which represents a single species, the second of which contains possibly more than one species, while the third apparently contains two species. The adults are unusual for Lathridiidae in being flightless, and thus subject to considerable geographical variation. The groups may be distinguished as follows:

1. Sides of pronotum crenate, with 4 or 5 prominent processes.
- - - - - spp. nov.
- Sides of pronotum crenulate or minutely dentate, with many small projections, but without prominent processes - 2
2. Prothorax approximately as in fig. 7, with evenly rounded sides; ratio greatest width : middle length about 1.25 : 1. Elytral costae moderately raised, outer costa not sinuate.
- - - - - **minor** and **serripennis**

—Prothorax different, sides rounded more strongly behind anterior angles, and almost straight and converging in basal two-thirds; ratio greatest width : middle length about 1.5 : 1. Elytral costae strongly raised, outer costa distinctly sinuate.

- - - - - **sinuosus**

Metophtalmus sinuosus Belon, 1884.

Belon, 1884, *Ann. Soc. ent. Belg.* 28: 224.

—1897, *Rev. Ent.* 16: 167 (*Lithostygnus*).

costatus Broun, 1886, *Man. N.Z. Col.* 4: 950 (*Lithostygnus*).

Cuneiceps Broun, 1914, *Bull. N.Z. Inst.* 1: 186 (*Lithostygnus*) n. syn.

Syntypes of *Lithostygnus costatus* and *L. cuneiceps* in Entomology Division are conspecific. The synonymy of **costatus** with **sinuosus** is given on the authority of Belon (1897). There are specimens in Entomology Division from Howick, Epsom, Titirangi, Hokianga Heads, Cape Reinga, Spirits Bay, Tom Bowling Bay and Motu River. Apparently it does not occur in the southern North Island or in the South Island.

Metophtalmus minor (Broun, 1893) and **M. serripennis** (Broun, 1914).

There is insufficient material available at present to establish the status of these species. Specimens which run to this complex in the key are structurally distinct from each of the few localities represented (Mataroa, Utuku, Rimutaka Summit, Molesworth, Nelson), while the type localities are Moeraki (**minor**) and Broken River (**serripennis**). I suspect that all are members of a single species, but they could represent a number of closely related allopatric species on the basis of the available material. They have occurred in tussock litter and nests of sea-birds. **M. serripennis** is established in Britain (Hinton, 1941), where it has been found associated with mouldy articles in cellars and outbuildings. Its biology and life history there have been described by Hammad (1953).

Metophtalmus spp. nov.

In this complex there are specimens from Spirits Bay, Hunua Ranges, Mistake Basin (Upper Wilberforce River), and Waimate. The South Island specimens are differently and much less strongly sculptured than the North Island specimens, and probably represent a separate species.

Corticaria Marsham, 1802

Marsham, 1802, Ent. Brit. 1: 106.

Belon, 1897, *Revue Ent.* 16: 115, 153.

Reitter, 1911, *Fauna Germ.* 3: 86.

Hatch, 1962, *Univ. Wash. Publs.* 16, 3: 122.

Diarthroceria Broun, 1893, *Man. N.Z. Col.* 6: 1348, n. syn.

Belon, 1897, *Revue Ent.* 16: 115, 153.

From Broun's description of **Diarthroceria** it was apparent that the genus was almost certainly based on two specimens of fairly ordinary *Corticariini* in which all except the two basal antennal segments had been broken off. This is confirmed by Mr. R. D. Pope, who writes (20 Mar. 69, in litt.) that **Diarthroceria formicaephila** is synonymous with **Corticaria melasoma** Broun, which is a true **Corticaria**. It is extraordinary that this "genus" should have been allowed to remain in existence for 75 years, and it is a considerable pleasure to sink it in synonymy, where henceforth it will lapse into the obscurity it deserves.

C. formicaephila may possibly be an endemic species, but all other true **Corticaria** spp. occurring in New Zealand have very extensive distributions elsewhere, and were probably introduced in the early days of European settlement. Apart from these, the numerous species described by Broun in **Corticaria** are all referred to **Melanophthalma** sens. lat., to which most of them were transferred by Belon (1897). The 5 true **Corticaria** spp. occurring here may be distinguished thus.

1. Relatively large species, length 2.3 - 3 mm. Elytral with unequal hairs, the long hairs being longer than apical segment of antennal club; long and short hairs arranged in alternate rows. Punctures of elytral intervals as large, or almost as large, as strial punctures - - - - - **pubescens**
— Smaller species, length not exceeding 1.8 mm. Elytral with short, subequal, decumbent hairs which are never as long as apical segment of antennal club. Punctures of elytral intervals usually much smaller than strial punctures - 2
2. Elytra with distinct rows of punctures only in basal half to two-thirds posteriorly these become effaced and the punctuation confused; intervals near base bear 2 rows of small punctures - - - - - **fenestralis**
— Elytra with distinct rows of punctures extending almost to apex; intervals bear only one row of small punctures - 3
3. Head with distinct, prominent temples behind eyes. Body colour blackish brown. Pubescence very fine.
- - - - - **formicaephila**
— Head without distinct temples. Body colour reddish brown. Pubescence coarser, hairs stouter - - - - - 4

4. Pronotum with sides coarsely serrate throughout; anterior half of disc with punctures coarser than facets of eyes and rarely separated by as much as one diameter. Elytra with punctures of intervals near base as coarse as strial punctures, and on middle of disc at least half as coarse as strial punctures - - - - - **serrata**

—Pronotum with sides finely serrate except near base, where there are 2-4 coarse teeth (fig. 3); anterior half of disc with punctures rarely as coarse as facets of eyes, and usually separated by 1 or 2 diameters. Elytra with punctures of intervals very fine, scarcely visible near base, and on middle of disc rarely more than a third as coarse as strial punctures - - - - - **elongata**

Corticaria formicaephila (Broun, 1893) **comb. nov.**

Broun, 1893, *Man. N.Z. Col. 6*: 1348 (**Diarthroceras**).

melasoma Broun, 1910, *Bull. N.Z. Inst. 1*: 27, **n. syn.**

This species is possibly endemic, although it will not be surprising if it eventually proves to be synonymous with an exotic species. It runs to **C. inconspicua** Woll. (= **crenicollis** auctorum non Mannerheim) in the key to Peetz (in Freude et alia, 1967), but does not agree with that species in colour (blackish brown instead of "Gelbrot"), and the male genitalia are very different. **C. formicaephila** was described on two specimens found in ants' nests at Ashburton. **C. melasoma** was based on a single specimen from Mt. Maungatua. There are specimens in Entomology Division from Pudding Hill, Mt. Hutt, Mistake Basin and Bell Rock (all inland Canterbury). It is interesting to note that the two species in the European fauna apparently closest to **C. formicaephila** (**C. longicollis** and **C. inconspicua**), are found in ants' nests.

Corticaria pubescens (Gyllenhal, 1827).

Gyllenhal, 1827, *Ins. Suec. 4*: 123 (**Latridius**).

Hinton, 1941, *Bull. ent. Res. 32*: 197, 240.

Peetz, 1967, in *Kâf. Mitteleur. 7*: 184.

brouni Hetschko, 1926, in *Junk, Col. Cat. 15 (85)*: 48, **n. syn.**

robusta Broun, 1914, *N.Z. Inst. Bull. 1, 3*: 183 (non Ganglbauer, 1899).

The only specimens of this species that I have seen from New Zealand are 2 syntypes of Broun from Methven. Hinton (1941) records **C. pubescens** from haystack and flood refuse, other vegetable debris, cellars, houses, stored tobacco, and old birds nests. Its distribution is stated to be nearly cosmopolitan.

Corticaria fenestralis (Linnaeus, 1758).

Linnaeus, 1758, Syst. Nat. ed. 10: 356 (**Dermestes**).

Hinton, 1941, **Bull. ent. Res.** 32: 197, 242.

ferruginea Marsham, 1802, Ent. Brit. 1: 111.

Peez, 1967, in Kâf. Mitteleur. 7: 187, fig. Aed 7 : 23.

longula Broun, 1910, **Bull. N.Z. Inst.** 1: 26, n. syn.

This species is obviously well established here. There are specimens in Entomology Division from Whangarei (16 Mar. 27), Swanson (22 Apr. 16), Karekare (Feb. 16), Okauia (Mar. 24), Rangataua (22 Jun. 17), Whangamoia Saddle, Nelson (14 Mar. 66), Mt. Hutt (28 Dec. 12), Hollyford Valley area, 5,000 ft. (14 Jan. 67), Milford Rd. (1 Dec. 66), and Adams Id., Auckland Islands (2 Feb. 66). Those specimens with ecological data were collected from moss or leaf litter. **C. fenestralis** has previously been recorded from Europe, Asia and North America, where it has been found in vegetable refuse, manure heaps, moss, under pine bark, in buildings and in flour (Hinton, 1941).

Corticaria elongata (Gyllenhal, 1827).

Gyllenhal, 1827, Ins. Suec. 4: 130 (**Latridius**).

Belon, 1884, **Revue Ent.** 3: 254.

Hinton, 1941, **Bull. ent. Res.** 32: 198, 243.

Peez, 1967, in Kâf. Mitteleur. 7: 188, fig. Aed 7 : 21.

First recorded from New Zealand (Auckland) by Belon, this species is represented in Entomology Division by only 2 specimens from Titirangi, 21 Mar. 13 (Broun Coll.), and one from Waiomio Bush, Kawakawa (3 Sept. 65). Its distribution is stated to be cosmopolitan, and it has been found in haystack refuse and other vegetable debris, beaten and swept from foliage, in dry fungus and on warehouse walls (Hinton, 1941).

Corticaria serrata (Paykull, 1798).

Paykull, 1798, Fauna Suec. 1: 300 (**Dermestes**).

Reitter, 1879, **Verhandl. naturf. Ver. Brünn** 18: 179.

Hinton, 1941, **Bull. ent. Res.** 32: 198.

Peez, 1967, in Kâf. Mitteleur. 7: 188, fig. Aed 7 : 11.

Recorded from New Zealand (Greymouth?) by Reitter (loc. cit.).

Melanophthalma Motschulsky, 1866

Motschulsky, 1866, **Bull. Soc. Imp. Nat. Mosc.** 39: 269.

Belon, 1897, **Revue Ent.** 16: 115, 147.

Hatch, 1962, **Univ. Wash. Publs** 16, 3: 122, 124.

Corticarina Reitter, 1880, **Verh. Zool.-bot. Ges. Wien** 30: 58.

Bicava Belon, 1884, **Revue Ent.** 3: 259 (subgenus).

All of Broun's indigenous species described in *Corticaria* (except *C. melasoma* belong in *Melanophthalma* sensu Belon. Together with Belon's and Reitter's species, there is a total of 36 names, of which I have seen authentically determined specimens of only 12. Thus no key is presented. The species included here exhibit considerable diversity, and will probably eventually have to be distributed in two or possibly three genera, corresponding perhaps with Belon's subgenera *Melanophthalma*, *Corticarina* and *Bicava*, but defined differently. Some species that fall into *Corticarina* in Belon's key appear to have closer affinities with *Bicava* in other respects.

Melanophthalma (Corticarina) gibbosa (Herbst, 1793) = *Corticaria finitima* Broun, 1880, n. syn., = *Corticaria hirtalis* Broun, 1880, n. syn., is commonly found in pastures (Cumber, 1959) and crops (Eyles, 1961). It may be distinguished from similar species in New Zealand by its size (1 - 1.6 mm in length), rounded, denticulate sides of prothorax (not angulate as in *M. zealandica* etc.), single transverse pronotal fovea, uniform dark brown colour, moderate, fairly dense punctation and short decumbent pubescence. No other species of *Melanophthalma* is known to occur on crops or improved pastures in New Zealand, but in other habitats, including indigenous grasslands, quite similar species are found.

Rethusus Broun, 1886

Broun, 1886, Man. N.Z. Col. 4: 835.

Belon, 1897, *Revue Ent.* 16: 152.

This distinct genus is endemic to New Zealand. Apparently no other Lathridiidae are known with the peculiar tarsal structure and appendiculate tarsal claws (figs. 4, 5).

- | | |
|--|------------------------------|
| 1.. Body uniformly fulvescent. Pubescence and setae fairly short. Elytra each with a discal and a lateral (humeral) longitudinal tubercle at base, and a few small tubercles on lateral and hind slopes | - - - - - fulvescens |
| — Body colour extremely variable, but never uniformly fulvescent. Pubescence and setae long. Elytra with numerous more prominent, rounded and elongate tubercles on disc as well as on lateral and hind slopes | - - - - - 2 |
| 2. Elytra entirely black, Pronotum longer than wide (Auckland) | - - - - - lachrymosus |
| — Elytra never entirely black. Pronotum slightly wider than long (Raurimu to Otago) | - - - - - pustulosus |

Rethusus pustulosus (Belon, 1884).

Belon, 1884, **Revue Ent.** 3: 263 (**Melanophthalma**).

—, 1895, **Ann. Soc. ent. Belg.** 39: 100, 102.

—1897, **Revue Ent.** 16: 152, 207.

pictulus Broun, 1886, **Man. N.Z. Col.** 4: 835 n. syn.

Belon, 1895, **Ann. Soc. ent. Belg.** 39: 102.

—1897, **Revue Ent.** 16: 152.

This species is extremely variable in colour individually, and also to some extent geographically. The size and shape of tubercles is somewhat variable individually and geographically. This variation is quite sufficient to cover the differences given by Belon (1897) between **pustulosus** and **pictulus**. Specimens in Entomology Division range from Raurimu to Otago. Most were collected by beating or sweeping forest vegetation, but a few are from leaf litter.

Rethusus lachrymosus Broun, 1886.

Broun, 1886, **Man. N.Z. Col.** 4: 836.

Belon, 1895, **Ann. Soc. ent. Belg.** 39: 102.

—1897, **Revue Ent.** 16: 152.

Known at present only from the holotype from Northcote (Auckland), this species seems to be close to, but probably distinct from, **pustulosus**.

Rethusus fulvescens Broun, 1921.

Broun, 1921, **Bull. N.Z. Inst.** 1, 6: 532.

This distinct species was described from Titirangi, and is represented in Entomology Division by 6 specimens from Western Hills, Whangarei (23 Oct. 26, Brookes).

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