

STUDIES OF THE COCCOIDEA. 2. REVISION OF SOME OF THE AUSTRALIAN ASPIDIOTINI DESCRIBED BY MASKELL.

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SUMMARY.

Examination of type specimens of some of the Aspidiotini from Australia described by Maskell and other relevant material has enabled the following conclusions.

Aspidiotus acaciae Morgan, *Pseudaonidia junctiloba* Marlatt and *Aspidiotus junctilobius* Froggatt are synonyms of *Aspidiotus eucalypti* Maskell, which is correctly placed in the genus *Neomorgania* and now becomes the genotype.

The variety *comatus* Maskell of *Aspidiotus eucalypti* Maskell represents a distinct species, and belongs to the genus *Pseudotargonia*.

Aspidiotus virescens Maskell is a synonym of *Diaspis fimbriata* Maskell which is now made the genotype of a new genus *Megaspidiotus*.

The characters of *Aspidiotus casuarinae* Maskell conform with those of the genus *Pseudaonidia* but as the type appears to be an immature adult further material is needed for examination.

These species have been re-described and re-illustrated.

INTRODUCTION.

The study of the Coccoidea in Queensland has involved a review of many of the earlier described Australian species. In a number of instances the descriptions and illustrations of these insects are inadequate for detailed taxonomic comparisons. Before identification can be made with confidence, type material of these species must be critically examined and for the benefit of future workers new descriptions and illustrations are necessary. This work is proceeding and has been assisted by the loan of Maskell's types from the Department of Science and Industry, Nelson, New Zealand; "part-type" material in the Green collection from the South Australian Museum; and cotypes, named and unnamed material from the Division of Entomology, C.S.I.R.O., Canberra.

The Maskell material dealt with in this paper consisted of slides, but the specimens were not well cleared before mounting and even with phase contrast examination some characters were not easily discerned. The study of the material, however, has assisted in determining the status of each of the species and has led to the establishment of new synonymy and a new genus.

Neomorgania eucalypti (Maskell).

(Figs. 1 and 2)

Type locality and host.—South Australia on *Eucalyptus* sp.*Synonymy.*—

- 1888: *Aspidiotus eucalypti* Maskell: Transactions of the Royal Society of South Australia: p. 102.
- 1889: *Aspidiotus acaciae* Morgan: Entomological Monthly Magazine: 25: p. 353.
- 1901: *Targionia acaciae* (Morgan): Leonardi: Revista di Patologia Vegetale: 8: p. 308.
- 1901: *Targionia eucalypti* (Maskell): Leonardi: Revista di Patologia Vegetale: 8: p. 310.
- 1908: *Pseudaonidia eucalypti* (Maskell): Marlatt: Proceedings of the Entomological Society of Washington: 9: p. 135.
- 1908: *Pseudaonidia junctiloba* Marlatt: Proceedings of the Entomological Society of Washington: 9: 135.
- 1914: *Aspidiotus (Targionia) acaciae* Morgan: Froggatt: Agricultural Gazette of New South Wales: 25: p. 131.
- 1914: *Aspidiotus (Targionia) eucalypti* Maskell: Agricultural Gazette of New South Wales: 25: p. 312.
- 1914: *Aspidiotus junctilobius* Froggatt: Agricultural Gazette of New South Wales: 25: p. 315.
- 1921: *Neomorgania acaciae* (Morgan): MacGillivray: The Coccidae: p. 458.
- 1921: *Neomorgania junctiloba* (Marlatt): MacGillivray: The Coccidae: p. 458.
- 1921: *Neomorgania eucalypti* (Maskell): MacGillivray: The Coccidae: p. 458.

The variety *propinquus* Maskell was determined by Leonardi (1901) as a synonym of the type *acaciae*. This determination remains to be confirmed.

Material examined.—From the Maskell collection, Department of Science and Industry, New Zealand, a slide specimen labelled “*Aspidiotus eucalypti*, adult female, South Australia, 1888, W.M.M.” The new description given is from this specimen.

From the South Australian Museum unmounted material labelled “*Aspidiotus junctiloba* Green, on *Acacia*, Shepparton, Victoria”; and “*Aspidiotus junctilobius* Frogg. on *Pittosporum phillyroides*, Mallee, J. E. Dixon.”

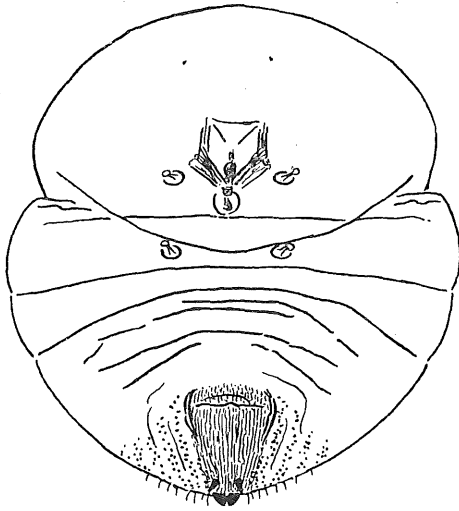


Fig. 1.

Neomorgania eucalypti (Mask.). Outline of adult female. (x 70).

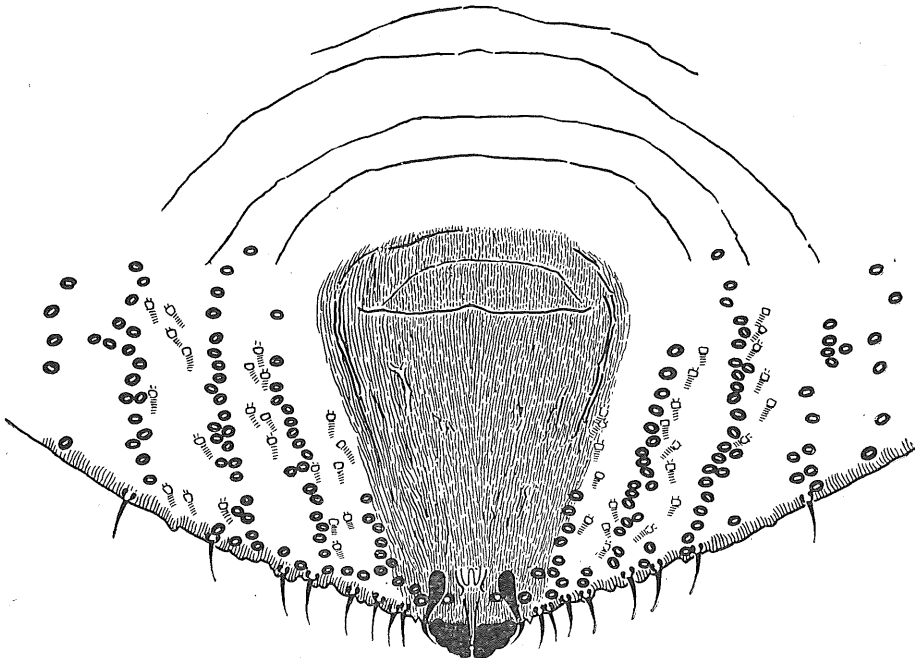


Fig. 2.

Neomorgania eucalypti (Mask.) Enlargement of pygidium. (x 250).

From the Froggatt collection of the Division of Entomology, C.S.I.R.O., Canberra, unmounted material labelled "Acacia stenophylla, Euston, N.S.W., 20.10.28, W.W.F."; and "Willow myrtle, Lake Hattah, Victoria, W.W.F."

Recognition characters.—Adult female subcircular with a definite thoracic constriction, length and width of the mounted specimen 0.8 mm. Pygidium not differentiated. Median lobes fused basally but divided dorsally by an anal groove, triangular, as broad as long, with indentations on the external margin. Other lobes absent. Basal scleroses absent. Paraphyses single and adjacent to the median lobe in each first interlobal area,* dilated and length slightly exceeding that of the lobe. An incipient simple plate in the first interlobal space.* Spines longer than the lobes except for a short one adjacent to and obscured by the lobe, curved with the outline of the lobe. Macroducts short and small, orifices in segmental series, with a few intervening near the margin, 11 or 12 in the first furrow,* 18 or 19 in the second and 23 or 24 in the third. Perivulvar pores absent. Anus small, within an inverted V with a groove directed between the lobes. Pygidial margin anterior to the lobes slightly crenulate. A tessellated fingerprint chitinization occurs on all parts of the body except for an irregular reticulation in the median pygidial area.

Notes.—The characters shown by Maskell's type specimen place it in the genus *Neomorgania* which is in agreement with the designation of the species by MacGillivray.

The specimens determined as *Pseudaonidia junctiloba* by Marlatt were labelled "Aspidiotus junctiloba Green on Acacia, Shepparton, Victoria," and therefore are part of the same material as those in the South Australian Museum. Green's name, being a label name only, has no status and Marlatt, by mentioning some distinguishing features, is the authority for the species.

MacGillivray established the genus *Neomorgania* for the three species *junctiloba* Marlatt, *acaciae* Morgan and *eucalypti* Maskell, but failed to designate the genotype. Ferris (1937) assigned *Pseudaonidia junctiloba* Marlatt to this position but used *Aspidiotus junctilobius* Froggatt for the genotype illustration, assuming these two species to be synonymous. Later Ferris (1941) listed Froggatt's species as the genotype.

A comparison between *junctiloba* Marlatt, as represented by the South Australian Museum material, and *acaciae* Morgan, as illustrated by Laing (1929) from a cotype in the British Museum, shows that the two names represent the same insect. Furthermore, a comparison between "Aspidiotus junctilobius Froggatt" from the South Australian Museum and Laing's illustration also shows that only one insect is involved. This evidence, together with that provided by Ferris, is taken as demonstrating that *junctiloba* Marlatt and *junctilobius* Froggatt are synonymous with *acaciae* Morgan.

* NOTE.—McKenzie (1939) is followed for the notation of the duct furrows, and the same notation is now used for the interlobal areas and spaces.

The re-description of Maskell's type specimen now shows that *acaciae* Morgan as illustrated by Laing is a synonym of *eucalypti* Maskell. Consequently *eucalypti* Maskell becomes the genotype of *Neomorgania* and this genus is monotypic.

It may be more than coincidence that *junctilobius* Froggatt described from Whitton, New South Wales, has the same locality as specimens from *Eucalyptus* sp. determined by Maskell (1893) as *acaciae* Morgan.

***Pseudotargionia comatus* (Maskell) new combination.**

(Figs. 3 and 4)

Type locality and host.—Australia: Melbourne on *Eucalyptus viminalis*.

Synonymy.—

1896: *Aspidiotus eucalypti* var. *comatus* Maskell: Transactions of the New Zealand Institute 1895: 28: p. 385.

1901: *Targionia eucalypti* var. *comatus* (Maskell): Leonardi: Revista di Patologia Vegetale: 8: p. 311.

Material examined.—A slide specimen labelled “*Aspidiotus eucalypti* var. *comatus*, adult female, 1895, W.M.M.”, and a number of Queensland specimens which are to be recorded in a later article.

Recognition characters.—Adult female very broadly turbinate, with a deep thoracic constriction, length of slide mount 0.9 mm., width 0.8 mm. Pygidium very broad basally, almost transversely elliptical in shape. Three pairs of lobes. Median lobes conspicuous, yoked basally, separated by a third of the width of the lobes, margins entire, sides subparallel, apex broadly rounded. Second pair of lobes as small triangular points, third similar to the second but smaller. Basal scleroses absent. Paraphyses on the median side of the first and second interlobal areas. A small single simple plate in the first interlobal space, three similar plates in the second space. Spines conspicuous, first pair of uneven length, the dorsal one slightly longer than the median lobes, and others progressively longer. Macroducts few, small and short, orifices small. Perivulvar pores absent. Anus very small, a lobe's length from the median lobe base, within an inverted V, with an anal groove directed between the median lobes. Pygidial margin beyond the third lobes finely crenulate. Median pygidial area with an irregular reticulate light chitinization, otherwise with a fingerprint chitinization with a similar but lighter pattern over the remainder of the body.

Notes.—Some of the characters are difficult to discern on the partly cleared, unstained specimen but there is sufficient evidence, supported by the local material, to show that this insect cannot be a variety of *Neomorgania*

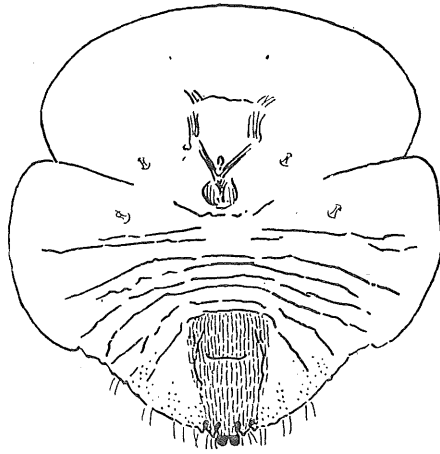


Fig. 3.

Pseudotargionia comatus (Mask.). Outline of adult female. (x 70).

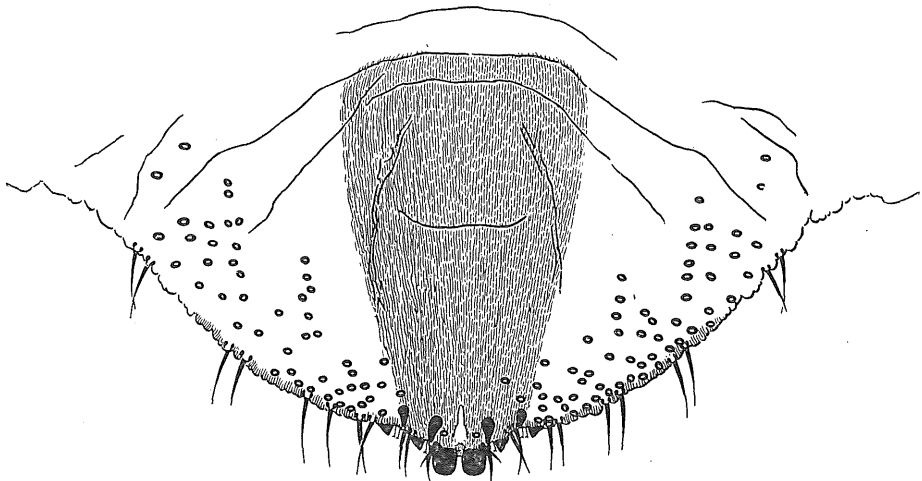


Fig. 4.

Pseudotargionia comatus (Mask.). Enlargement of pygidium. (x 215).

eucalypti (Maskell). Of the established genera, it conforms most closely to *Pseudotargionia*, in which it is now placed. Marlatt (1908), when placing the species *eucalypti* in the genus *Pseudaonidia*, stated: "The variety *comatus* Maskell has no valid status as determined by careful examination of authentic material." An examination of the type slides of both *eucalypti* and the variety *comatus* shows however that the two represent distinct species. Fuller (1899) was afraid that his *perniciosus* var. *eucalypti* might be in confusion with Maskell's *comatus*, but again a different insect is involved.

Megaspidiotus new genus.

Genotype.—*Diaspis* (?) *fimbriata* Maskell, 1893: Transactions of the New Zealand Institute 1892: 25: p. 208.

Characters.—Body of adult female with a thoracic constriction, anterior and posterior portions subequal in length, anterior portion wider, dome shaped, posterior portion subtriangular or margins broadly curved. Three pairs of lobes, second and third pairs varying slightly in size and shape from the median. Median lobes only with basal scleroses. Paraphyses absent. Macroducts short but broad, orifices large. Plates numerous and conspicuous, extending on most of the pygidial margin, broadly fimbriate. Perivulvar pores present. Anus moderately large.

Notes.—The large size, constricted thorax and profuse plates are not typical of the genus *Aspidiotus* with which *Megaspidiotus* has closest affinity. When describing the species *fimbriata* Maskell (1893) was rather puzzled about its generic position, and while explaining that he believed it to be correctly placed in the genus *Diaspis*, a question mark was included in the published name. The species *virescens* here regarded as a synonym was placed by Maskell (1896) in *Aspidiotus*.

Megaspidiotus fimbriatus (Maskell).

(Figs. 5 and 6)

Type locality and host.—Australia: Near Sydney on *Eugenia smithii*.

Synonymy.—

1893: *Diaspis* (?) *fimbriata* Maskell: Transactions of the New Zealand Institute 1892: 25: p. 208.

1896: *Aspidiotus virescens* Maskell: Transactions of the New New Zealand Institute 1895: 28: p. 384.

1897: *Aspidiotus fimbriatus* (Maskell): Cockerell: United States of America Department of Agriculture, Technical Series No. 6: p. 26.

1899: *Aspidiotus (Evaspidiotus) fimbriatus* (Maskell): Leonardi: Revista di Patalogio Vegetale: 7: p. 58.

1899: *Aspidiotus (Evaspidiotus) virescens* Maskell: Leonardi: Revista di Patalogia Vegetale: 7: p. 64.

Material examined.—Two specimens on a slide labelled “*Diaspis fimbriata* females and puparium, Australia, 1892. W.M.M.” The re-description given is from this slide.

A slide specimen labelled “*Aspidiotus virescens*, adult female, 1895, W.M.M.”

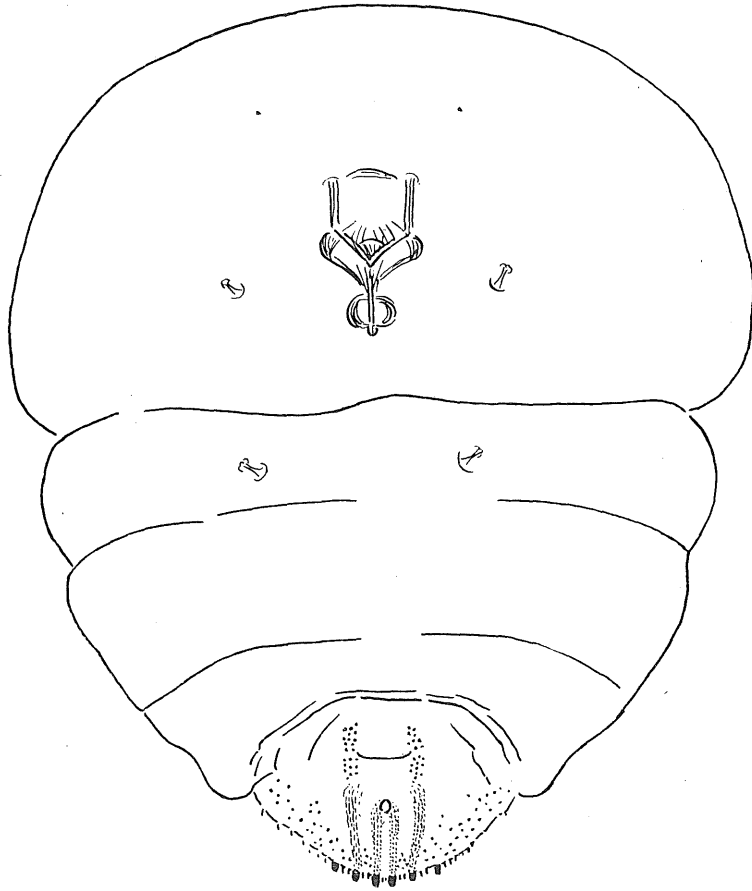


Fig. 5.

Megaspidiotus fimbriatus (Mask.). Outline of adult female. (x 70).

Recognition characters.—Adult female broadly turbinate with lateral constrictions, length of slide specimens 1.4 and 1.6 mm., width 1.2 and 1.4 mm. Pygidium subcircular to transversely elliptical in the older specimen which is the larger (and contains eggs). Three pairs of lobes. Median pair longer than wide, slightly constricted at the base and narrowing apically to a rounded point, which is not so pronounced in the older specimen, separated by more than the lobe width. Second pair of lobes similar to the median but slightly smaller and less indented on the inner margin, separated from the median by twice the width of the latter. Third pair similar but smaller, separated from the second pair by three times the median lobe width. Basal scleroses from the median lobes only. Paraphyses absent. Plates conspicuous, longer than the lobes, extending forwards on about two thirds of the pygidial margin, two between the median lobes, two in the first interlobal space and three in the second space, all of these broad, apically dilated and fimbriate;

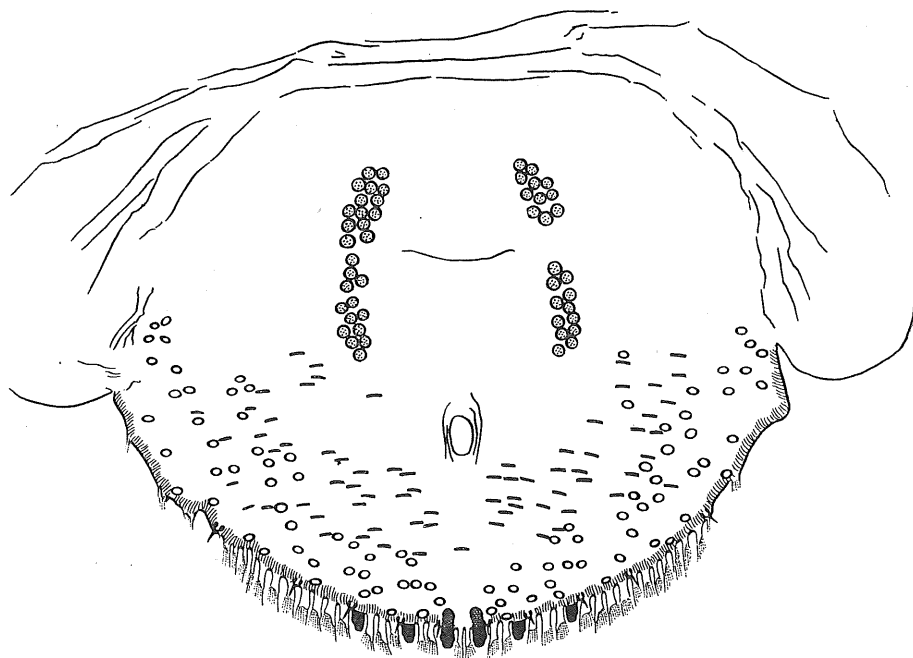


Fig. 6.

Megaspidotus fimbriatus (Mask.). Enlargement of pygidium. (x 220).

plates numerous beyond the third lobe, nine and ten of similar broad, fimbriate shape, decreasing slightly in size in the younger specimen with a further two or three of irregular shape, eleven beyond the third lobe in the older specimen with about five of irregular shape. Spines short and inconspicuous. Macroducts broad, slightly less than half the distance from the median lobes to the anus, orifices large, arranged in the typical manner of *Aspidiotus*, one opening in the median area, nine or ten in the first duct furrow, about fifteen in the second, and about eighteen in the third. Perivulvar pores in four or five groups, anterior median 5 (old specimen), anterior laterals 11 to 13, posterior 10 to 13. Anus of moderate size nearer to the median lobes than to the anterior of the pygidium.

Notes.—The type locality and host record for both *Diaspis* (?) *fimbriata* and *Aspidiotus virescens* are near Sydney, New South Wales, on *Eugenia smithii*. A comparison of the two slides shows that the characters presented by *Aspidiotus virescens* agree with those of *Diaspis* (?) *fimbriata* except that anterior to the third lobe there are twelve broad fimbriate plates plus possibly five others; there appear to be eleven orifices in the first duct furrow, seventeen to nineteen in the second and about twenty in the third; and the anterior lateral perivulvar pores number 16 and 18, the posterior 9 and 13. These differences are not significant and might in part be due to the poor slide mounts.

***Pseudaonidia casuarinae* (Maskell).**

(Figs. 7 and 8)

Type locality and host.—New South Wales: Albury on *Casuarina equisetifolia*.

Synonymy—

- 1894: *Aspidiotus casuarinae* Maskell: Transactions of the New Zealand Institute 1893: 26: p. 26.
- 1901: *Targionia casuarinae* (Maskell): Leonardi: Revista di Patologia Vegetale: 8: p. 314.
- 1908: *Pseudaonidia casuarinae* (Maskell): Marlatt: Proceedings of the Entomological Society of Washington: 9: p. 135.
- 1914: *Aspidiotus (Targionia) casuarinae* Maskell: Froggatt: Agricultural Gazette of New South Wales: 25: p. 134.
- 1921: *Targaspidotus casuarinae* (Maskell): MacGillivray: The Coccidae: p. 447.

Material examined.—A slide specimen labelled “*Aspidiotus casuarinae*, adult female, 1893; W.M.M.”

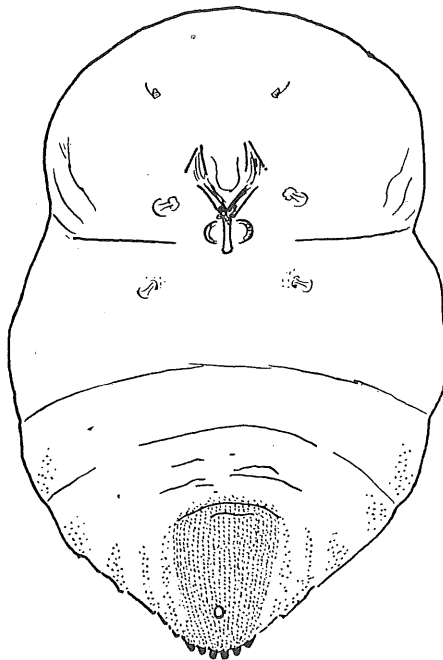


Fig. 7.

Pseudaonidia casuarinae (Mask.). Outline of adult female. (x 70).

Recognition characters.—Adult female somewhat oval, with a thoracic constriction, and narrowing posteriorly. Length of slide specimen 1.2 m.m., width 0.8 mm. Pygidium very broad basally, not differentiated, apex obtuse. Three pairs of lobes. Median pair slightly longer than wide, sides subparallel, apex rounded, separated by slightly less than the lobe width. Second pair of lobes shorter than the median, but of comparable width, apex with a small point, slightly convergent, the posterior outer surface more curved than the inner, separated from the median by the lobe width. Third pair of lobes

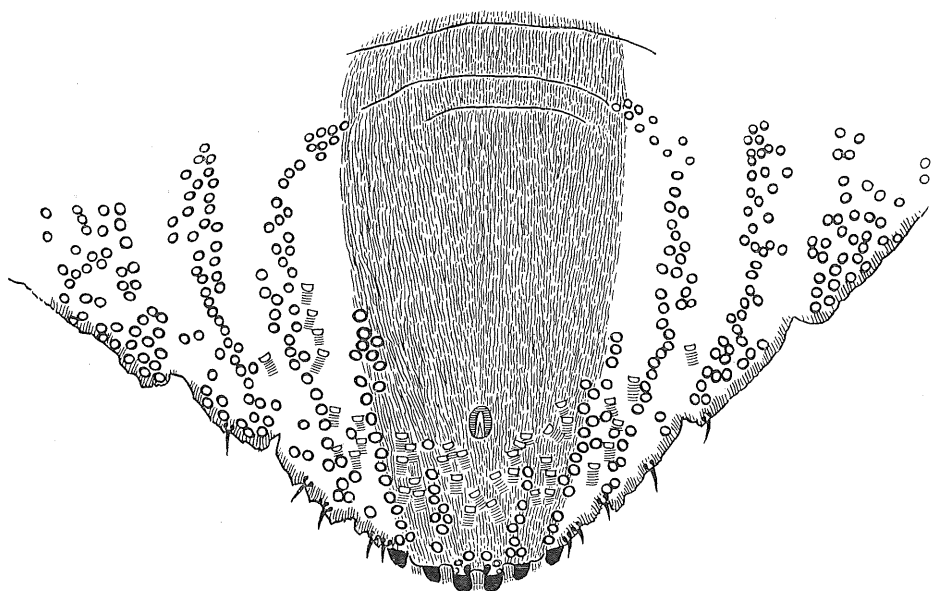


Fig. 8.

Pseudoanidia casuarinae (Mask.). Enlargement of pygidium. (x 240).

subequal to the second, apex pointed, convergent, separated from the second by slightly more than the median lobe's width. Basal scleroses absent. Paraphyses absent. Plates present in the median, first and second interlobal spaces, as a pair in the median and first spaces, shorter than the lobes, apparently with the apex bifid, number and nature of those in the second space not distinct. Spines shorter than the lobes. Macroducts broad, length less than half the distance between lobes and anus, orifices large, two in the median furrow, 10-11 in the first furrow, possibly between 20 and 25 in the second furrow, numerous in other furrows. Perivulvar pores absent. Anus small, within an inverted V, one third of the pygidial length from the median lobes. Pygidial margin irregular anterior to the third lobes. Body surface with faint fingerprint chitinization.

Notes.—There is the impression of a small pair of paraphyses in the median interlobal space. The broken nature of the pygidial margin might indicate a fourth pair of lobes. These and the other features mentioned are in general agreement with the characters of the genus *Pseudaonidia* in which this species was placed by Marlatt. The specimen probably is an immature adult and the shape presented may be due to lack of expansion and chitinization which would develop with age and feeding. The number of duct orifices, however, is excessive for the genus and perivulvar pores are absent; therefore further discussion is deferred until additional material is available.

ACKNOWLEDGEMENTS.

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