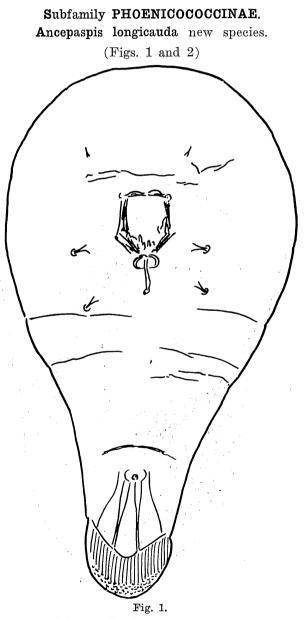
## STUDIES OF THE COCCOIDEA. 10. NEW SPECIES OF DIASPIDIDAE.

By A. R. BRIMBLECOMBE, M.Sc., Senior Entomologist, Division of Plant Industry.

#### SUMMARY.

New species of scale insects from Queensland described in the family Diaspididae are Ancepaspis longicauda, A. magnicauda, A. asperata, A. reticulata, A. rotundicauda, A. striata, Andaspis numerata, Aulacaspis australis, Doriopus bilobus, Phenacaspis difissata, Poliaspis attenuata, and P. elongata. The genus Doriopus is also new.



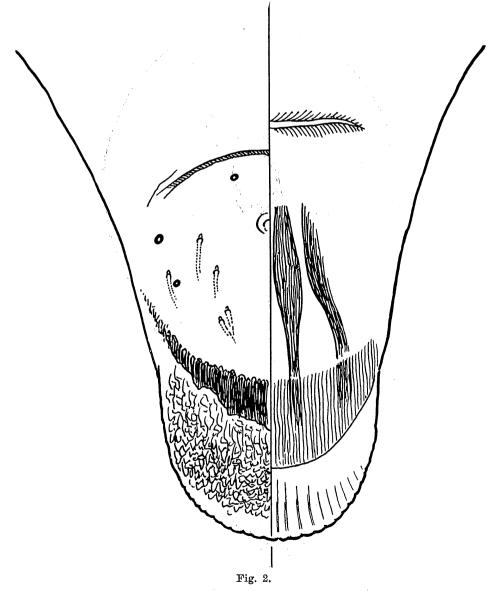
Ancepaspis longicauda. Outline of Adult Female, X 100.

#### A. R. BRIMBLECOMBE

Locality and host.—Queensland: Marmor, on Casuarina glauca Sieb., Oct. 1955.

*Habit.*—Insects occurring singly or in small groups in forks of branchlets, or singly in crevices of the rough bark on small branches.

Recognition characters.—Adult female pyriform, mostly membranous; length of slide specimen 1.3 mm., width 0.5 mm. Pygidium long, sclerotized, anterior part broad, posterior part or cauda mostly densely sclerotized; caudal extension wide, broadly crescentic, dorsally reticulate, apex broadly rounded, entire. Ventral precaudal area with three longitudinal furrows, one

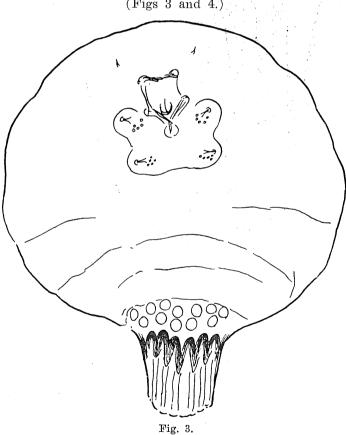


Ancepaspis longicauda. Enlargement of Pygidium, X 380.

median and a submedian pair, all anteriorly narrow and widening posteriorly, intervening dense longitudinal bands reaching slightly anterior to the position of the anal opening. Vulva anterior to the anal opening, surrounded by a circular fold. Dorsal ducts long, slender, moderately numerous, opening on the cauda. Spiracles large, anterior pair with associated pores.

Notes.—The shape of this species is proportionately longer than that shown by the species described by Ferris (1942), of which only A. edentata has an entire caudal margin. A. longicauda differs from this species in having a long densely sclerotized posterior caudal portion, and not having an anteriorly arched thickened dorsal ridge.

Type Reg. No. T5768 and paratype No. T5769 in the Queensland Museum.



Ancepaspis magnicauda new species. (Figs 3 and 4.)

Ancepaspis magnicauda. Outline of Adult Female, X 130.

Locality and host.—Queensland: Tara, on Acacia harpophylla F. Muell. ex Benth., Aug. 1957 (L. Pedley).

*Habit.*—Insects mostly single in cracks, crevices and bark scars on twigs and small branches.

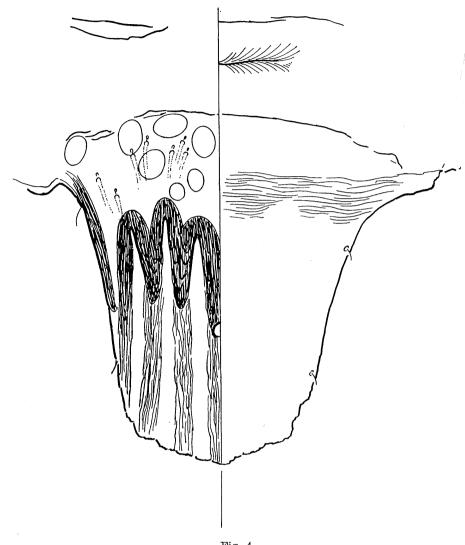


Fig. 4. Ancepaspis magnicauda. Enlargement of Pygidium, X 330.

 $Recognition\ characters.$ —Adult female membranous, globular, sub-circular, with the cauda extending beyond the general body outline; length of slide specimen  $0.8\ mm$ ., width  $0.7\ mm$ . Pygidium anteriorly membranous, basally broad, cauda slightly more than half pygidial width; precaudal portion lightly sclerotized but with many subcircular less dense areas. Cauda as wide as long, basally densely sclerotized in a scalloped border; posteriorly with seven longitudinal bars of denser sclerotization symmetrically placed; posterior margin with some small indentations. Anal opening obscured by the dense sclerotization. Vulva in anterior membranous part of pygidium. Ducts sparse, long and slender. The four spiracles close and embodied in a subquadrate area of sclerotization. Anterior spiracles with associated pores.

*Notes.*—The median longitudinal dense caudal bar may appear as doubled for part of its length. This species resembles *A. novemdentata* Ferris but the caudal apex is not deeply fissured, and the spiracles are close and embodied in a subquadrate sclerotized plate.

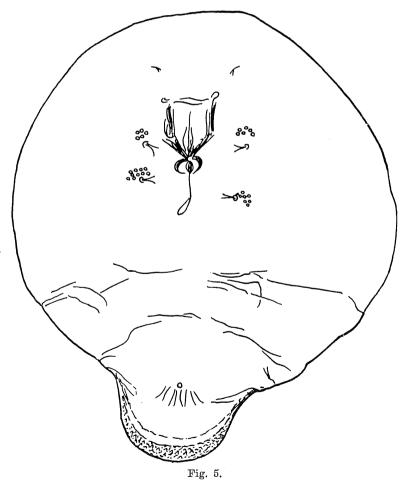
Type Reg. No. T5770 and paratype No. T5771 in the Queensland Museum.

## Ancepaspis asperata new species.

(Figs. 5 and 6.)

Locality and host.—Queensland: Tugun, on Casuarina littoralis Salisb., May 1953.

Habit.—Insects mostly single under rough pieces of bark or in forks of small branches.



Ancepaspis asperata. Outline of Adult Female, X 200.

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Recognition characters.—Adult female membranous, globular; length of slide specimen 0.6 mm., width 0.5 mm. Pygidium subcircular, anteriorly not differentiated by a thickened ridge. Densely sclerotized caudal portion crescentic or semicircular with diverging lateral arms. Precaudal median and submedian longitudinal furrows short, intervening dense bands short and oval, precaudal submarginal dense areas with mesal margin curved. Densely sclerotized caudal dorsal surface with irregularly crescentic rows of asperities. Dorsal ducts sparse, slender. Anal opening centrally in pygidium. Anterior spiracles with five to seven associated pores, posterior spiracles with nine to 11 associated pores.

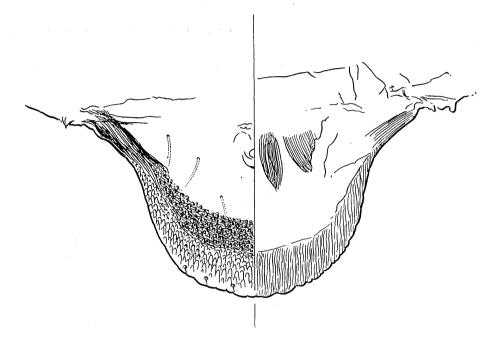


Fig. 6. Ancepaspis asperata. Enlargement of Pygidium, X 330.

*Notes.*—The apical margin of the cauda may have symmetrically placed indentations. In some specimens the cauda may be narrowly crescentic, in other specimens it may be almost quadrate. The number of pores associated with the spiracles may be fewer in number.

This species resembles A. edentata (Ferris) but differs in not having on the pygidium the anterior arched ridge and in having the longitudinal furrows and bands in the precaudal region. There are some resemblances in pygidial characters to A. longicauda but in the latter species the cauda is longer, the sclerotized deposition is reticulate and there are no marginal indentations. In addition, A. longicauda is more elongate in shape and the posterior spiracles are without associated pores.

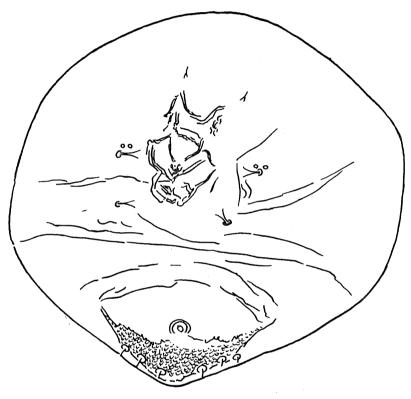
Type Reg. No. T5776 and paratype No. T5777 in the Queensland Museum.

### Ancepaspis reticulata new species.

(Figs. 7 and 8.)

Locality and host.—Queensland: Pikedale, on Casuarina luchmanni R. T. Baker, Oct. 1954.

*Habit.*—Insects under rough pieces of bark tissue or in forks of small branches.





Ancepaspis reticulata. Outline of Adult Female, X 160.

Recognition characters.—Adult female globular, membranous; length of slide specimen 0.5 mm., width 0.5 mm. Pygidium large and mostly sclerotized. Densely sclerotized cauda crescentic, lateral arms anteriorly joined by a dorsal arched ridge of sclerotization. Ventral surface with median and submedian furrows; intervening dense longitudinal bands elongate-oval, the submarginal dense area with inner margin curved. Cauda dorsally with asperities, segmental marginal dorsal spines large with bases surrounded by less densely sclerotized areas, giving the margin a scalloped appearance. Anal opening posteriorly placed. Anterior spiracles with associated pores.

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*Notes.*—The shape of most of the specimens examined is irregularly globular, although in some instances the outline is more uniform and almost subcircular.

The species has some resemblance to A. asperata but the large spines on the cauda and the demarcated spine bases distinguish the species.

Type Reg. No. T5778 and paratype No. T5779 in the Queensland Museum.

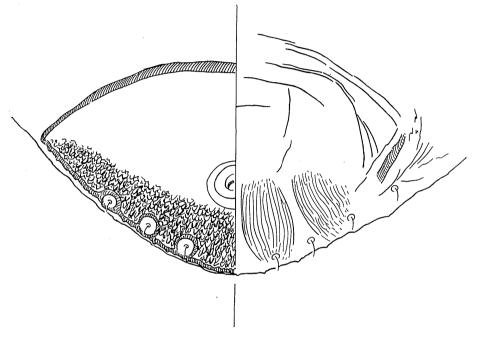


Fig. 8. Ancepaspis reticulata. Enlargement of Pygidium, X 270.

### Ancepaspis rotundicauda new species.

(Figs. 9 and 10.)

Locality and host.—Queensland: Moggill, on Casuarina cunninghamiana Miq., Sept. 1943.

*Habit.*—Insects single or in small groups in crevices and scars on small branches and in forks of the branchlets, accompanied by small amounts of mealy material.

Recognition characters.—Adult female globular, membranous; length of slide specimen 0.5 mm., width 0.4 mm. Pygidium more or less round, densely sclerotized cauda crescentic, arms anteriorly joined by a dorsal arched ridge. Ventral precaudal area with a median and a pair of submedian furrows; the intervening dense bands elongate, widest posteriorly; the submarginal areas

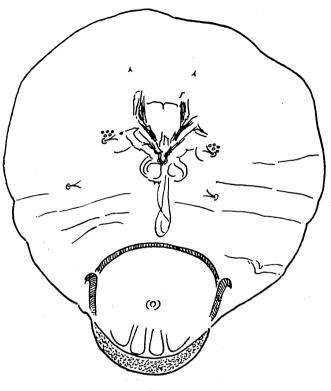


Fig. 9.

Ancepaspis rotundicauda. Outline of Adult Female, X 190.

with inner and posterior margins angled. Ducts sparse, long and slender. Anal opening small, centrally placed on pygidium. Vulva anteriorly on pygidium. Anterior spiracles with two or three associated pores; posterior spiracles without associated pores.

*Notes.*—The pores associated with the anterior spiracles may vary from one to five. The crescentic cauda may appear to be rolled ventrally on the posterior margin. The dorsal anteriorly arched ridge on the pygidium may be semicircular, giving the cauda and ridge a round shape, or the ridge may be broadly arched, giving the cauda and ridge a semicircular shape.

This species has some resemblance to A. asperata but differs in that the posterior spiracles have no associated pores and the pygidium has the anteriorly arched dorsal ridge.

Type Reg. No. T5780 and paratype No. T5781 in the Queensland Museum.

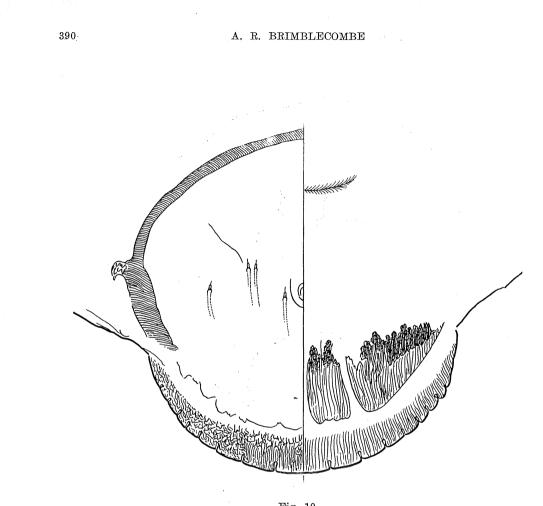


Fig. 10. Ancepaspis rotundicauda. Enlargement of Pygidium, X 260.

Ancepaspis striata new species.

(Figs. 11 and 12.)

Locality and host.—Queensland: Yelarbon, on Casuarina lepidophloia F. Muell., Sept. 1947.

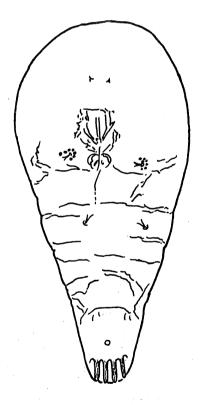
*Habit.*—Insects occurring under loose bark fragments, in scars and in forks of branchlets.

Recognition characters.—Adult female elongate-oval, membranous except pygidium; length of slide specimen 0.85 mm., width 0.4 mm. Pygidium large, mostly sclerotized. Cauda large, crescentic, with four symmetrically placed longitudinal denser sclerotized bands, apex rounded with the bands projecting as small marginal round protuberances. Precaudal area sclerotized, anteriorly

bordered dorsally by a semicircular arch joining the arms of the caudal crescent. Anterior border of cauda scalloped. Dorsal ducts long and slender. Anal opening small, oval, placed anteriorly in pygidium. Pygidial segmental spines submarginal on caudal denser sclerotized bands. Vulva in a semicircular ventral fold. Anterior spiracles with six or seven associated pores. Cephalic portion anterior to mouthparts comparatively large.

*Notes.*—This species resembles *A. longicauda* in shape and size but differs in that the cauda has longitudinal bands and striations and the precaudal bands and furrows are not present.

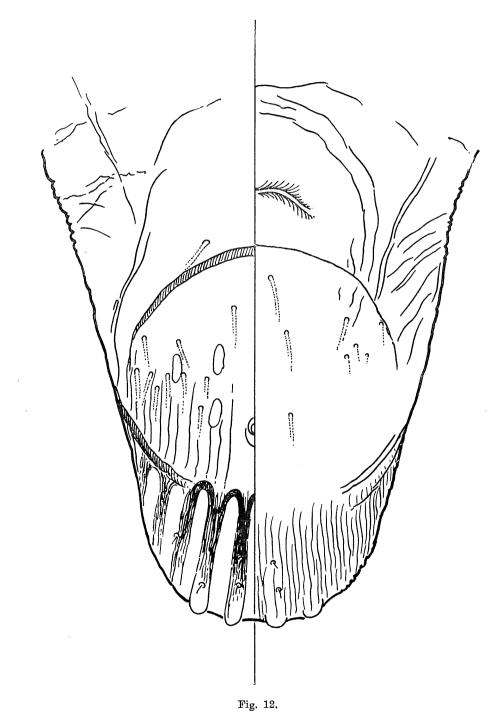
Type Reg. No. T5782 and paratype No. T5783 in the Queensland Museum.





Ancepaspis striata. Outline of Adult Female, X 110.





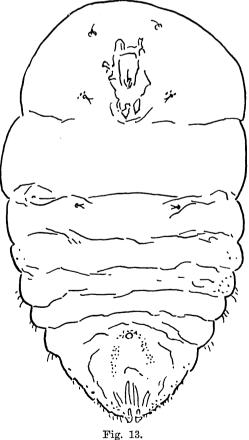
# Subfamily DIASPIDINAE. Tribe Diaspidini. Andaspis numerata new species.

(Figs. 13 and 14.)

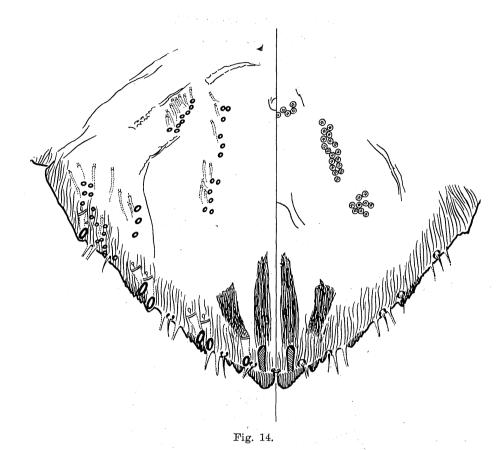
Locality and host.—Queensland: Danbulla, on Cedrela toona Roxb. var. australis (F. Muell.) C.DC., Oct. 1938.

Habit.—Insects singly under felty fungus on twigs.

Recognition characters.—Adult female elongate-oval, membranous; length of slide specimen 1.2 mm., width 0.5 mm. Pygidium large, with two pairs of lobes. Median lobes one-and-a-half times as wide as long; inner margins subparallel, with a subapical indentation; outer margin angled, distal portion larger with four or five indentations, almost serrate; apex rounded. Second pair of lobes bilobed, the loblet small, triangular and almost independent. Third and fourth lobe positions marked by sclerotized serrations. Basal scleroses of median lobes elongate, longer than the lobes, one quarter as wide, arising medianly from the bases of the lobes. Two gland spines in each of the second, third, and fourth



Andaspis numerata. Outline of Adult Female, X 95.



Andaspis numerata. Enlargement of Pygidium, X 250.

interlobal spaces, simple, longer than the lobes. Macroducts with marginal orifices placed one in the first interlobal area, two in each of the second and third areas, one in the fourth; other dorsal ducts small and in segmental series. Perivulvar pores in five groups, 10 in the median, 17 to 19 in the anterior lateral groups, 8 to 10 in the posterior lateral groups. Anal opening anteriorly in pygidium. Vulva slightly less than half the distance of the anal opening from the lobes. Anterior spiracles with two or three associated pores.

*Notes.*—The basal scleroses may be slightly apically enlarged. Sometimes there may be three gland spines in the fourth interlobal space, and a small one in the first space.

This species has some resemblance to A. hawaiiensis (Maskell) but differs in having the second pair of lobes and no marginal spurs on the third and fourth abdominal segments.

Type Reg. No. T5784 and paratypes Nos. T5785 and T5786 in the Queensland Museum.

## Aulacaspis australis new species. (Figs. 15 and 16.)

Locality and host.—Queensland: Sandgate, on Bruguiera gymnorhiza Lam., Apr. 1947.

Habit.—Insects scattered on leaves. Scales subcircular, white, length 1.5 mm.; pellicles brownish green.

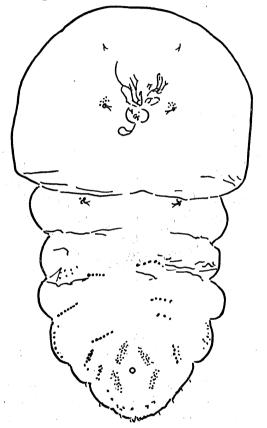


Fig. 15. Aulacaspis australis. Outline of Adult Female, X 100.

Recognition characters.—Adult female elongate; length of slide specimen  $1 \cdot 1 \text{ mm.}$ ; width  $0 \cdot 65 \text{ mm.}$ ; prosoma large, as wide as and almost as long as the length of the postsoma. Prosoma tubercles present but not prominent. Pygidium large, not differentiated, apex broadly rounded. Median lobes moderately short, divergent; inner margins broadly rounded, basally close; outer margins and apex broadly rounded. Lobules of the second pair of lobes similar, the outer lobule slightly smaller than the inner lobule. Third pair of lobes similar to the second pair. Gland spines single in the first, second and third interlobal spaces. Eight macroducts with marginal orifices. Other ducts in segmental series on abdominal segments; first segment with 3 or 4 ducts in anterior group, 5 in posterior group; second segment with 5 in anterior group,

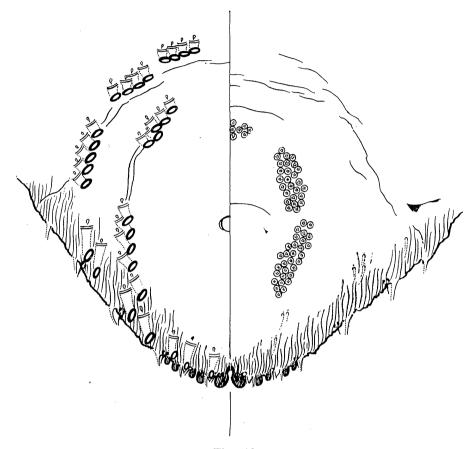


Fig. 16. Aulacaspis australis. Enlargement of Pygidium, X 320.

posterior divided into a submedian group of 4 or 5 and submarginal group of 5 or 6; third segment with 4 or 5 in anterior group, 4 or 5 in the submedian and 6 or 7 in the submarginal; fourth segment with 4 in the anterior, 4 in the submedian and 5 in the submarginal; fifth segment, anterior group absent, 4 or 5 in the submedian, 4 or 5 in the submarginal; a row of ducts absent on the sixth segment. Small marginal ducts present on abdominal segments two and three. Perivulvar pores in five groups; 12 in anterior group, 26 to 28 in anterior lateral groups, 26 to 30 in posterior lateral groups. Anterior spiracles with 12 to 14 associated pores; posterior spiracles with 2 or 3 associated pores.

*Notes.*—In some specimens one of the posterior groups of ducts on the first abdominal segment may be absent.

This species has a close resemblance to A. crawii (Cockerell) but differs in having neither dorsal ducts on the sixth abdominal segment nor any indication of a fourth pair of pygidial lobes.

Type Reg. No. T5772 and paratypes Nos. T5773 to T5775 in the Queensland Museum.

#### Doriopus bilobus new species.

(Figs. 17 and 18.)

Type locality and host.—Queensland: Gayndah, on Acacia bidwillii Benth., Oct. 1954 (L. Pedley).

Habit.—Insects mostly single, embedded partly or wholly in the copious corky tissue on branches of the host. Adult female enclosed in the enlarged second stage nymph, which is olive green in colour, with a length to 1.0 mm. and width to 0.75 mm.

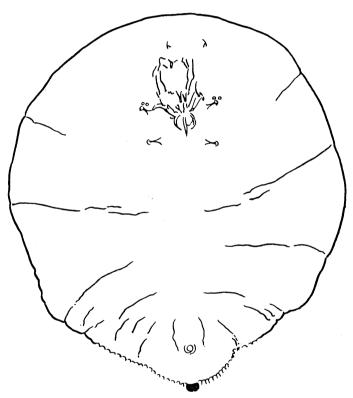


Fig. 17 Doriopus bilobus. Outline of Adult Female, X 130.

*Recognition characters.*—Adult female subcircular, membranous; length of slide specimen 0.75 mm., width 0.7 mm. Pygidium not differentiated, posterior part lightly sclerotized, with median pair of lobes only. Lobes large, one-and-a-half times as long as wide, contiguous; inner margins straight and parallel; outer margins constricted basally, broadly curved to the apex, with four latero-apical indentations. Basal scleroses and paraphyses absent. Gland spines shorter than the lobes, simple derm projections in a continuous

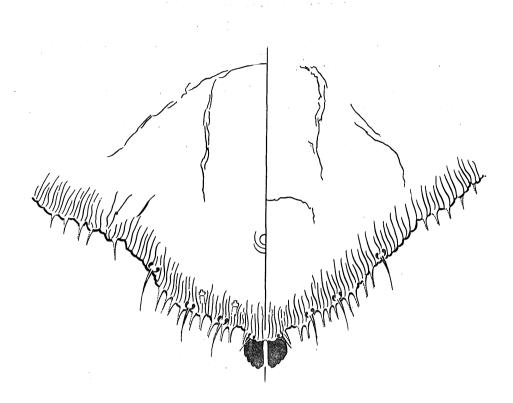


Fig. 18. Doriopus bilobus. Enlargement of Pygidium, X 280.

series on the pygidium and extending anteriorly on abdominal segments, progressively smaller until as small dome-shaped processes. Spines adjacent to the lobes shorter than the lobes, other pygidial spines longer than the lobes. Dorsal ducts few and indistinct, short, orifices marginal, possibly one in each of the first and second interlobal areas. Anal opening round, moderately large in an apparent short anal tube, four times the length of the lobes from the bases of the lobes. Anterior spiracles with two or three associated pores. Posterior spiracles placed well forward.

*Notes.*—In some specimens the lobes may be twice as long as wide with the indentations on a somewhat blunt apex. The lobes also may be slightly constricted basally on the inner margin. There may be marginal incisions on each side of the pair of lobes, making the lobes appear as surmounting an apical pygidial projection.

Type Reg. No. T5791 and paratypes Nos. T5792 to T5794 in the Queensland Museum.

#### Phenacaspis difissata new species.

(Figs. 19 and 20.)

Locality and host.—Queensland: Tugun, on Banksia integrifolia L.f., Dec. 1948.

*Habit.*—Insects singly on under leaf surface. Scales elongate-oval to pyriform, white, length 1.5 mm.

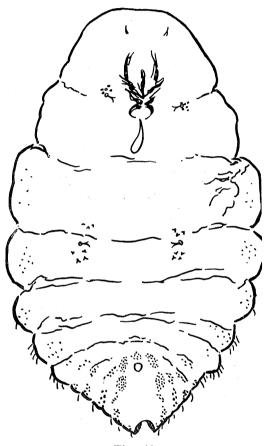
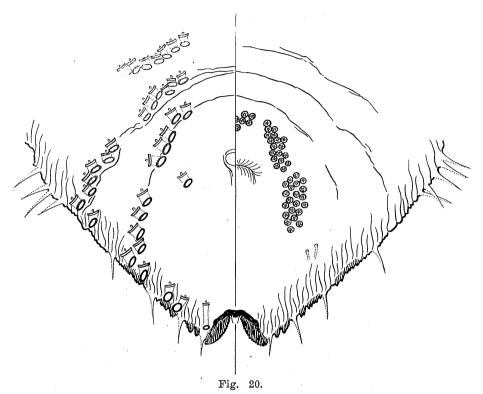


Fig. 19. Phenacaspis difissata. Outline of Adult Female, X 100.

Recognition characters.—Adult female elongate-oval, membranous; length of slide specimen 1.1 mm., width 0.8 mm. Pygidial margins almost straight, placed at or near a right angle; apex deeply incised or cleft, the cleft yoked basally. Median pair of lobes lining the cleft, barely exceeding the pygidial margin, bases separated, margin long, broadly curved and finely serrate. Second pair of lobes with lobules subtriangular; inner lobule margins entire, outer lobule with one or two indentations on outer margin; third pair of lobes with inner lobule triangular, outer lobule broad and short with serrations. Fourth lobe position marked by a chitinous marginal serration. Gland spines single on pygidium, in groups on prepygidial segments. Six



Phenacaspis difissata. Enlargement of Pygidium, X 230.

pygidial macroducts with marginal orifices. Other ducts in segmental series; first abdominal segment with 0 to 4 ducts in a submarginal group; second segment with 8 to 10 submarginal, 5 to 7 submedian; third segment with 7 or 8 submarginal, 7 submedian; fourth segment with 5 or 6 submarginal, 6 submedian; fifth segment with 3 or 4 submarginal and 4 or 5 submedian; sixth segment with 0 to 2 submedian. Groups of smaller ducts submarginally on abdominal segments one and two and on the metathorax. Perivulvar pores in five groups, 10 pores in the median group, 18 to 20 in the anterior lateral and 20 to 23 in the posterior lateral groups. Anterior spiracles with four or five associated pores. A group of three or four short-based spines both posterior to and anterior to the posterior spiracles. Anal opening round, placed anteriorly on the pygidium.

Notes.—This species resembles P. megaloba (Green) in having a deep pygidial incision but differs in having a segmental series of ducts on the second abdominal segment. The third pair of lobes may be sclerotized marginal serrations similar to those in the fourth lobe position; sometimes the serrations in the latter position also may be indistinct. The ventral groups of small, broad-based spines resemble those of P. eugeniae (Maskell) but P. difissata differs from that species in having two pairs of these groups of spines, a large pygidial incision and longer pygidial lobes.

Type Reg. No. T5789 and paratype No. T5790 in the Queensland Museum.

Poliaspis attenuata new species.

(Figs. 21 and 22.)

Locality and host.—Queensland: Yarraman, on Croton insularis Baill., Sept. 1948.

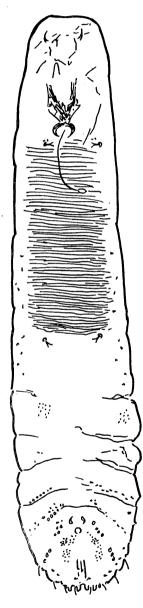


Fig. 21. Poliaspis altenuata. Outline of Adult Female, X 95.

*Habit.*—Insects single, lining the margin of leaves. Scales linear, white in colour, 3.5 mm. in length; pellicles dark orange colour.

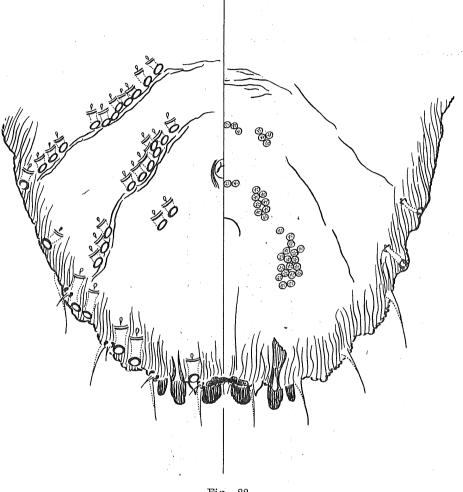


Fig. 22

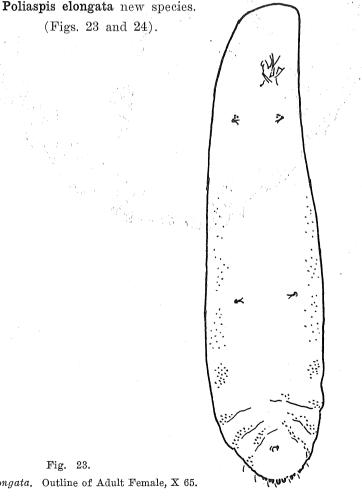
Poliaspis attenuata. Enlargement of Pygidium, X 300.

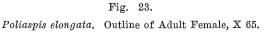
Recognition characters.—Adult female very long and slender, membranous; length of slide specimen 1.6 mm, width 0.3 mm. Pygidium broadly rounded with two pairs of lobes. Median lobes longer than wide, asymmetrical, separated by a lobe's width, margin indented, almost serrate. Second pair of lobes with the inner lobule longer than wide projecting beyond the median lobes, outer lobule similar to but smaller than the inner. Gland spines single on pygidium. Spines small. Seven macroducts with marginal orifices. Other ducts in segmental series; third abdominal segment with three in the submarginal group and seven to nine in the submedian group; fourth segment with three submarginal, eight submedian; fifth segment with

four submarginal and five or six submedian; sixth segment with two submedian. Perivulvar pores in eight groups; ancilliary anterior group with six pores, ancillary lateral groups with four pores, the three groups placed closely together; normal anterior group with four pores, normal anterior lateral groups with eight or nine and posterior lateral groups with 18 or 19 pores. Anterior spiracles with two or three associated pores. Anterior and posterior spiracles widely separated. Ventral body surface with transverse fine fingerprint sclerotization.

Notes.—The very long body of this species and P. elongata separates them from all other species in the genus. This species differs from P. elongata in having the median lobes longer than wide and asymmetrical.

Type Reg. No. T5798 and paratype No. T5799 in the Queensland Museum.





#### A. R. BRIMBLECOMBE

Locality and host.—Queensland: Tugun, on Leptospermum whitei Cheel, Sept. 1947.

Habit.—Insects single, lining the margin of leaves. Scales elongate, white, length 2.5 mm., pellicles dark orange in colour.

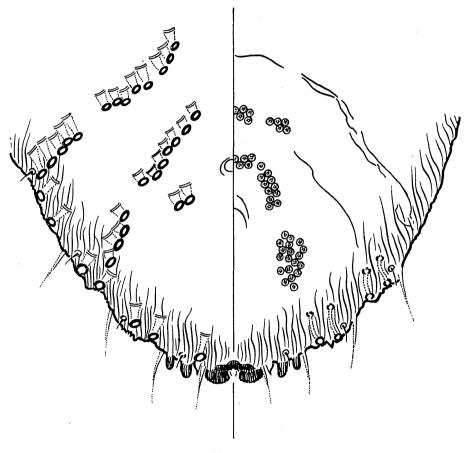


Fig. 24.

Poliaspis elongata. Enlargement of Pygidium, X 250.

Recognition characters.—Adult female long and slender, membranous; length of slide specimen 1.7 mm., width 0.4 mm. Pygidium rounded, with two pairs of lobes. Median lobes wider than long, each practically symmetrical, intervening cleft basally yoked, small. Second pair of lobes with lobules independent; inner lobule almost one-and-a-half times as long as wide, not projecting beyond the median lobes; outer lobule similar to the inner but much smaller. Gland spines single on pygidium. Spines small. Seven macroducts with marginal orifices. Other ducts in segmental series; third abdominal

segment five to seven in the submarginal group, five to 10 in the submedian group; fourth segment with five in the submarginal, six to eight in the submedian; fifth segment with three to five in the submarginal, five to seven in the submedian, sixth segment with two or three in the submedian group. Perivulvar pores in eight groups; ancilliary anterior group with six to eight pores, ancillary lateral groups with four to seven; normal anterior group with six to eight pores and anterior lateral groups with eight to 14, posterior lateral groups with 18 to 23. Anterior spiracles with two to four associated pores. Anterior and posterior spiracles widely separated.

*Notes.*—This species is close to *P. attenuata* but differs in having the medium lobes wider than long and each lobe practically of symmetrical shape.

Type Reg. No. T5795 and paratypes Nos. T5796 and T5797 in the Queensland Museum.

Locality and host.—Queensland: Kenmore, on Callistemon viminalis (Soland. ex Gaertn.) G. Don. ex Loud., Apr. 1958.

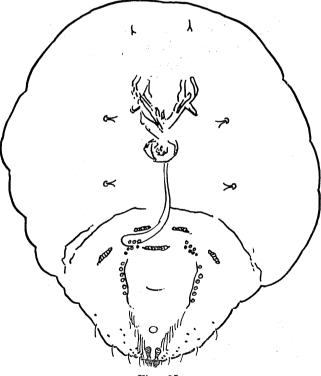


Fig. 25. Morganella nudata. Outline of Adult Female, X 95.

#### Tribe Aspidiotini.

Morganella nudata new species.

(Figs. 25 and 26.)

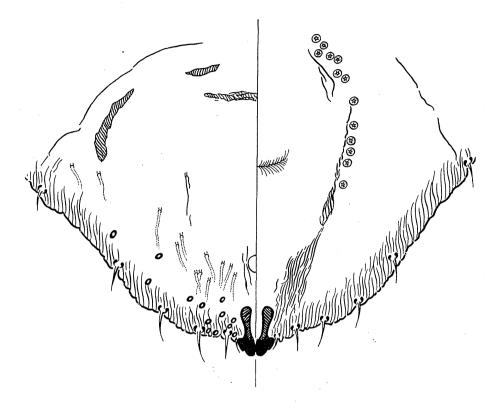


Fig. 26.

Morganella nudata. Enlargement of Pygidium, X 240.

Habit.—Insects single and sparse, under corky tissue on twigs.

Recognition characters.—Adult female broadly pyriform to subcircular, membranous; length of slide specimen 1.0 mm., width 0.8 mm.Pygidium large, not differentiated, apex broadly rounded, median pair of lobes only. Lobes longer than wide, convergent; inner margins adpressed for the distal half; outer margins convergent, notched midway; apex rounded. Basal scleroses large, divergent, basally one-half to two-thirds as wide as the lobes, one-and-a-half times as long as the lobes and apically enlarged. Paraphyses and plates absent. Spines adjacent to the lobes shorter than the lobes, other spines longer. Dorsal ducts sparse, slender, moderately long, reaching almost to the anal opening in the medial region; five ducts in the first furrow; six in the second furrow. Lateral and median dorsal scars present. Sclerotized arms from the pygidial apex and paravulvar folds co-linear. Perivulvar pores in four groups, six to eight in the anterior lateral groups and five to seven in the posterior lateral groups.

*Notes.*—The notch on the outer margin of the lobes may be almost subapical and sometimes two small indentations may be present.

This species has some resemblance to M. longispina (Morgan) but it differs in having perivulvar pores and no plates.

Type Reg. No. T5787 and paratype No. T5788 in the Queensland Museum.

#### ACKNOWLEDGEMENT.

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## REFERENCE.

FERRIS, G. L. 1942: Atlas of the Scale Insects of North America, Series 4. Stanford University Press.

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ADDENDUM to "Studies of the Coccoidea. 10. New Species of Diaspididae," by A. R. Brimblecombe, this Journal, Vol. 16, p. 381.

#### **DORIOPUS** new genus

Generic type.—Doriopus bilobus Brimblecombe.

*Characters.*—Adult female enclosed in the enlarged and heavily sclerotized exuvium of the second stage nymph, subcircular, membranous. Pygidium with median pair of large contiguous lobes. Basal scleroses and paraphyses absent. Gland spines in a continuous row on pygidial and prepygidial segments. Dorsal ducts few and indistinct.

*Notes.*—This genus has relationship with the other Australian genera *Hybridaspis* and *Hemiaspidis* in having the adult enclosed in the second exuvium but differs from these in that the gland spines on the pygidial margin are in a continuous series and none are broad with a divided apex.