ACARINA FROM AUSTRALIAN BATS.

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(Twenty-six Text-figures.)

[Read 24th September, 1958.]

Synopsis.

Twenty-one species of mites, belonging to seven families, are now known from Australian bats.

In the Laelaptidae, the genus Ichoronyssus is recorded from Australia for the first time. *I. leucippe*, n. sp., and *I. aristippe*, n. sp., being described from *Miniopterus schreibersii blepitis*. *Trichonyssus*, n. g., is erected, with *Chiroptonyssus australicus* Wom. as genotype, and also including *T. womerseyi*, n. sp., based on males from *M. s. blepitis* and *Nyctophilus geoffroyi*, which were originally ascribed by Womersley to *Plesiolaelaps miniopterus*. *Plesiolaelaps* Wom. is considered to be a synonym of *Spathelaelaps* Radford, and the males of *S. miniopterus* (Wom.) and *Bewsiella federmanus* Domrow are described from *M. s. blepitis* and *Hipposideros bicolor albicans*.

In the Trombiculidae, the genus *Trombigastia* is recorded from Australia for the first time, represented by *T. alcithoe*, n. sp., from *H. b. albicans*. *Trombicula dasyploca*, n. sp., is described from *H. semoni*.

In the Listrophoridae, *Alabidocarpus recurvus* (Wom.), originally described from a single female, is redescribed in both sexes from *Rhinolophus megaphyllus*.

The present paper is intended to provide a summary of the known mite parasites of Australian bats. Sixteen species have been described or recorded since 1931, while five new species are described below. These 21 species are distributed among seven families. All these species are discussed below, but there is some doubt whether several of them are true parasites of bats.

Family SPINTURNICIDAE.

Two species of *Spinturnix*, a large, widespread genus found exclusively on bats, have been recorded from Australia. They are *S. antipodianus* and *S. novachollandiae*, both described from unidentified hosts by Hirst (1931). The paper was posthumous, and based on brief manuscript notes. Its publication was delayed for some time in the hope of finding Hirst's illustrations, but none appear to have been made.

Family LAELAPTIDAE.

In addition to the genera and species discussed below, I have recorded (1958) *Neolaelaps spinosus* (Berlese) from *Pteropus conspicillatus* Gould in North Queensland, and described *Bewsiella federmanus* from *Hipposideros semoni* Matschie from Cape York Peninsula.

Genus Ichoronyssus Kolenati.

*Ichoronyssus leucippe*, n. sp. (Text-figs. 1–2.)

*TYPES*: Holotype female in Queensland Museum, Brisbane; from rump of the bat *Miniopterus schreibersii blepitis* (Temminck), Yandina, S.E. Queensland, 10.IV.1958.

*Description of female.*—A medium-sized, well-sclerotized species with slender legs; length of idiosoma 530 μ, breadth 324 μ. *Dorsum*: Dorsal shield well developed, but tapering somewhat in posterior quarter, and truncate posteriorly; with punctae forming coarse irregular scale-like pattern over entire surface; with seventeen pairs of lateral setae (the anterior ones much longer than the posterior), nine pairs of median setae equal in size to posterolateral setae, and at least thirteen pairs of pores as shown. Marginal cuticle with about 22 pairs of setae. Stigmata placed ventrolaterally between coxae III and IV, but with peritremes running forward onto dorsum, and extending

almost to vertex. **Venter:** Sternal shield preceded by striate zone behind tritosternal base; with anterior margin ill defined, and slightly concave between sternal setae I; posterior margin deeply concave; with usual six setae and four pores in addition to two irregular porose areas (each composed of four smaller zones) outside anterior pores. Metasternal setae and pores free in cuticle. Genital shield tapering to just behind level of coxae IV; with one pair of setae, and irregular scale-like markings anteriorly, which merge into longitudinal striae posteriorly (the two striae running inwards and forwards from behind the genital setae are much stronger than the remainder). Anal shield slightly flattened anteriorly, but rounded laterally and tapering posteriorly to point, which is covered by minute spinules; anus set in anterior half, with adanal setae near level of posterior margin of anus, and smaller than postanal seta. Ventral cuticle probably with three pairs of pores and about 46 setae, the posterior two setae being slightly stronger than the rest. **Legs** slender, with II and III slightly thicker than I and IV; I 398μ, II 345μ, III 356μ, IV 463μ long. Coxae II to IV with crescentic sclerotized arc in posterior half, and coxae II with strong spine-like process on anterodorsal margin as illustrated by Hirst (1921, p. 792) for *I. flavus*. Femora I and II with two slightly stronger setae on dorsodistal edge as figured by Hirst (1921, p. 782) for *H. sternalis*. **Gnathosoma:** Basal movable segment of palp ventrionternally with anteriorly directed process as figured by Hirst (1921, p. 793) for *I. flavus*. Chelicerae with ventral movable finger strong and unarmed, but dorsal fixed digit weak, and with minute retrorse spines as figured by Furman (1950, p. 481) for *I. longisetosus*.

**Distribution.**—Known only from the type host and locality in S.E. Queensland, but see final sentence of remarks on *Alabidocarpus* below. This is the first Australian record of *Ichoronyssus*.

**Ichoronyssus aristippe, n. sp.** (Text-figs. 3–6.)

*Types:* Holotype female and morphotype nymph in Queensland Museum, Brisbane; both from rump of the bat *Miniopterus schreibersii blepotic* (Temminck), Teviotbrook, S.E. Queensland, 10.x.1957.
Description of female.—Similar to *I. leucippe* unless otherwise stated. Length of idiosoma 689μ. **Dorsum:** Dorsal shield with fine, regular striae forming scale-like pattern over entire surface; with seventeen pairs of elongate lateral setae, eight pairs of minute median setae, and seventeen pairs of pores as shown. Marginal cuticle with about 30 pairs of setae. **Venter:** Sternal shield with anterior margin straight but ill defined; with two undivided circular porose areas outside anterior pores. Genital plate with irregular longitudinal striae of uniform strength. Anal plate evenly rounded anteriorly. Ventral cuticle with about 50 setae. **Legs:** I 582μ, II 507μ, III 535μ, IV 671μ.
long. Anterior process of coxae II with minute backwardly directed barbule on external edge. *Gnathosoma*; Basal movable segment of palp with ventrointernal surface obscured during mounting, but apparently modified.

**Description of early nymph.**—Weakly sclerotized, idiosomal length 389μ. *Dorsum* with two shields. Anterodorsal shield pointed in front, but widening broadly, and almost rectilinear posteriorly; with seven pairs of elongate marginal setae, four pairs of minute median setae, and numerous irregular punctae. Postdorsal shield smaller, and widely separated from anterodorsal shield; lateral and posterior margins straight, but anterior margin produced medially into triangular process; with five pairs of minute lateral setae, two elongate posterior setas, and several punctae. Dorsal cuticle with five pairs of setae around peritremes, six pairs between two shields and two terminal setae. Peritremes abbreviated and situated above coxae III and IV. *Venter*: Intercoxal shield heptagonal, with five sides slightly concave, and tapering evenly to a point between coxae III and IV; with three pairs of setae and at least one pair of pores. Anal shield as in adult. Ventral cuticle with two smaller setae between coxae IV, and six larger setae in front of anal shield. *Legs* somewhat stouter than in adult; I 250μ, II 242μ, III 214μ, IV 271μ long. Otherwise as in adult.

**Distribution.**—Known only from the type host and locality in S.E. Queensland.

**Remarks.**—I have followed Baker and Wharton (1952) in accepting *Lepronyssus* as a synonym of *Ichoronyssus*, although I prefer to keep *Chiroptonyssus* and *Spinolaelaps* apart for the present. da Fonseca (1948) puts *Ichoronyssus* and *Lepronyssus* in the same couplet of his key, separating them on the presence or absence of scale-like markings on the genital plate. Hirst (1921) gives an excellent figure of these markings in *I. flavus* (placed in *Lepronyssus* by da Fonseca). Furman’s figure (1950) of *I. longisetosus* is semidiagrammatic, but shows that markings are present on the genital shield, particularly a pair of stronger ones running forwards and inwards from behind the genital setae. Radford’s (1941) figure of *I. britannicus* shows these two markings clearly, but I feel his material is really conspecific with *I. flavus*.

da Fonseca (1948) makes much of the presence of two porose areas on the sternal shield in delimiting his two monotypic genera *Hirstesia* and *Lepronyssoides*, but there is no doubt that these porose areas are also regularly present in *Ichoronyssus* as here understood. *I. flavus* (possibly, and certainly if *britannicus* is a synonym), *I. granulosus* and *I. longisetosus* all possess these porose areas, as do the two species described above. Figures of species which otherwise fit in *Ichoronyssus* as here understood, but do not show these two characters on the genital and sternal shields, should not be accepted without reserve.

Two other characters are also regularly present in *Ichoronyssus*—a ventrointernal process on the basal movable segment of the palpi, and an anterodorsal spine on coxae II. Both these characters are present in the genotype of *Hirstesia*, which, apart from the additional setae on the genitoventral plate, is a typical *Ichoronyssus*. *Lepronyssoides* is also very close to *Ichoronyssus* as here understood.

Several species of *Ichoronyssus* are recorded from Europe and America, but they are not at all well known. I have therefore preferred to describe the above two species in detail as new. They may be separated by the number of median dorsal setae present, the size of these setae relative to the lateral setae of the dorsal shield, and the shape of the porose areas on the sternal shield. Minor differences are also to be seen in the shape of the dorsal and anal shields, and the pattern of striae on the genital shield.

**Trichonyssus, n. g.** (θρίξ, a hair; νυσσω, to prick).

**Diagnosis.**—Laelaptid parasites of bats, with the following characters. *Female*: Dorsal shield entire; sternal shield with two pairs of setae; sternal setae III free in cuticle; genital shield with one pair of setae; coxae without heavy spines. *Male*: Dorsal shield as in female; holoventral shield entire, slightly expanded behind coxae IV; legs not abnormally enlarged, their coxae without heavy spines; femora IV unarmed behind; ambulacral apparatus of tarsi II not modified; body cuticle posteriorly with numerous extraordinarily long setae. *Genotype*: *Chiroptonyssus australicus* Womersley, 1956.
In da Fonseca's keys (1948) *Trichonyssus* runs close to *Chiroptonyssus*, but may be separated in the female by having the metasternal setae free and not set on platelets, and in the male by the complete holoventral shield, the lack of a strong process on femur IV, and the presence of extremely long opisthosomal setae. Two species are included in the new genus, the genotype (which Womersley only tentatively assigned to *Chiroptonyssus* Augustson) and a new species described below.

**Trichonyssus australicus** (Womersley, 1956), n. comb.

There is nothing to add to the original description of this species, which was described in both sexes from an unidentified South Australian bat.

**Trichonyssus womersleyi**, n. sp.

*Types:* I designate as holotype male the specimen which Womersley (1957) designated as allotype male of *Lis Plesiolaclaps miniopterus* from *Miniopterus schreibersii bleeptis* (Temminck), Joanna, South Australia, 10.xii.1932, J. Hood coll.

**Description of male.**—Length of idiosoma 422μ, width 280μ. Leg II stoutest; femur IV without any process. Dorsal shield entire, with short setae. All ventral shields fused to form holoventral shield, with ventral area slightly expanded behind coxae IV. With about 20 pairs of short setae on ventral cuticle, and about 16 pairs on ventral portion of holoventral shield. Other ventral setae normal. Posterior margin with two distinct groups of seven very long setae (100μ). Digits of chelicerae unarmed, and shorter than spermatophore carrier.

**Remarks.**—This species was described as the male of *Plesiolaclaps miniopterus*, but Mr. Womersley is in agreement with me that the sexes were wrongly correlated. The true male of *Plesiolaclaps* is described below, the genus being reduced to a synonym of *Spinolaclaps* Radford. *T. womersleyi* may be separated from *T. australicus* (genotype and only other known species) by having elongate setae in two groups of seven posteriorly instead of in a broad circle of about 45 around the entire opisthosomal margin. According to Womersley (in litt., June. 1958) the nymph described as *P. miniopterus* also belongs to *T. womersleyi*.

**Genus Spinolaclaps** Radford.

*Spinolaclaps miniopterus* (Womersley, 1957), n. comb. (Text-figs. 7-10.)

*Types:* Womersley's holotype female is in the South Australian Museum, Adelaide. Two plesiotype males are here designated, one in the South Australian Museum and one in the Queensland Institute of Medical Research, Brisbane, both from *Miniopterus schreibersii bleeptis* (Temminck), Teviotbrook, S.E. Queensland, 10.x.1957. The plesiotype male in the South Australian Museum could be regarded as the allotype. The specimen designated as allotype of this species by Womersley is not congeneric with the holotype, and has been designated above as the holotype of *Trichonyssus womersleyi*, n. sp.

**Description of female.**—An oval, well-sclerotized, medium-sized species, idiosomal length 410-428μ, breadth 261-278μ. Dorsal shield entire, oval, but truncate and very slightly concave posteriorly; with fine striae forming scale-like pattern over entire surface, apart from heavily sclerotized vertex; with seventeen pairs of lateral setae, twelve pairs of median setae (of which the inner posterior pair are very minute), and fifteen pairs of minute pores. Marginal cuticle with 19-22 pairs of setae. All dorsal setae subequal. Stigmata distinct, with rather narrow peritremes extending forward to level of anterior margin of coxae II. **Venter:** Sternal shield with anterior margin evenly convex, and preceded by striate cuticle. Posterior margin concave. With usual three pairs of sternal setae and two pairs of pores in addition to metasternal pores, which are borne on posterolateral extensions of sternal shield. Surface of shield with regular transverse striae. Metasternal setae borne on minute platelets. Genitoventral shield flask-shaped, but somewhat narrower than genital operculum, which has irregular markings. Shield proper with three transverse striae, and two lateral and one posterior seta in addition to usual pair of genital setae. Anal shield with central anus flanked by adanal setae, which are subequal to postanal seta.
Ventral cuticle with about 28 pairs of setae, some of which are borne on minute platelets. **Legs**: Leg I enlarged and also with larger claw than II–IV. Tarsus I with small sclerotized pit on dorsodistal face, presumably to accept tarsal claws when drawn back. Femur I with two very strong setae dorsally, and femur II with one. Both setae on coxae I and posterior seta on coxae II and III slightly thickened. **Gnathosoma** with two stronger setae posteroventrally. Chelicerae slender, with weak unarmed digits.

Text-figs. 7–10.—*Spinolaelaps miniopterus* (Womersley). 7, Dorsum of female; 8, Venter of female; 9, Venter of nymph; 10, Venter of male.

Text-figs. 11–16.—*Beuviella fledermaus* Domrow. 11, Dorsum of nymph; 12, Venter of nymph; 13, Venter of male; 14, Postdorsal shield of female, amended; 15, chelicerae of female on left, and of male on right (at twice indicated scale); 16, Venter of female, amended.
Description of male.—The male described by Womersley belongs to the new genus (*Trichonyssus*) defined above. The true male is as follows. Slightly smaller than female, idiosomal length 316–357μ, breadth 225–232μ. Dorsally (including peritremes) as in female. *Venter*: Intercoxal shield with anterior margin as in female except for median genital aperture; tapering evenly to terminate roundly between coxae IV; with usual five pairs of setae and three pairs of pores; with regular transverse striae anteriorly. Ventral shield tapering posteriorly and then expanding to fuse with anal shield; with about 22 setae in addition to usual three anal setae. Ventral cuticle with about five pairs of setae. *Legs* as in female. *Gnathosoma*: Chelicerae with fixed finger reduced and somewhat shorter than stout spermatophore carrying finger.

Description of nymph.—Idiosomal length 328μ, breadth 214μ. Dorsal shields indistinct, but setal pattern similar to adult. With reduced peritremes curved above coxae III and IV. Intercoxal shield broadly rounded anteriorly and laterally; posterior margin rectilinear between coxae III and IV; with three pairs of setae and transverse striae. With two smaller setae between coxae IV and six larger ventral setae in front of anal plate. Legs as in adult.

Material examined.—Six females, two males and one nymph from *Miniopterus schreibersii* blepotis (Temminck), Teviotbrook, S.E. Queensland, 10.x.1957; also one male from *Hipposideros bicolor* albanensis Gray, Bramston Beach, North Queensland, 13.xii.1957.

Remarks.—*Spinolaelaps* is in many respects similar to *Bewsiella*. Both are bat parasites of similar facies, particularly in the characteristic sternal, genitoventral and anal areas, the strong lateral peritremes, the enlarged front legs with their strong claws, and the dorsal setation of femora I and II. *Bewsiella*, however, has a double dorsal shield, while *Spinolaelaps* has one. Womersley (1957) described *Plesiolaelaps miniopeterus* as a new genus and species, and compared it with *Radfordilaelaps* Zumpt from a South African springhare, but *Plesiolaelaps* is here considered to be a synonym of *Spinolaelaps* Radford, of which the genotype (*S. jacksoni* Rad.) is a parasite of an African bat. It is of interest that several other genera discussed in this paper are also found both on African and Australian bats, e.g., *Calcaryobia*, *Trombigastia* and *Alabidocarpus*.

In the female *S. miniopeterus* may be separated from *S. jacksoni* by having three additional setae on the genitoventral plate instead of nine, and by its rather thicker anterior legs. In the male the shape of the ventral anal shield differs in the two species. Although the outline of the dorsal shield is probably not shown in either Radford’s or Womersley’s figure, the general arrangement of dorsal setae in their two genera is similar.

Note added 6th October, 1958.—I have since been able to see material from both Womersley’s and Radford’s type series. The shape and setal and pore patterns of the dorsal shield in both genera are as figured below. In addition Radford’s genus shows the following characters in common with Womersley’s pit on dorsodistal face of tarsus I: basal gnathosomal seta enlarged; stigmata sometimes clearly open to exterior, with peritremes extending forward to anterior margin of coxa II; anal shield similarly shaped, with tendency to encroach onto dorsal surface; genital operculum with irregular markings; some ventral setae on platelets. The variation in number of ventral setae taken in by the genital shield is clearly only of specific value, and I now have no hesitation in placing *Plesiolaelaps* as a synonym of *Spinolaelaps*.

Genus Bewsiella Domrow.

*Bewsiella* fledermaus Domrow, 1958 (genotype). (Text-figs. 11–16.)

*Types*: Allotype male in Queensland Museum, Brisbane, as is the holotype female, and with collection data as given below.

Description of female.—While the original description is adequate for recognition, the specimen figured is atypical in some respects. All six additional specimens show the following features. Postdorsal shield slightly concave between two larger posterior setae; with two very minute setae between and slightly in front of these larger setae. Posterolateral corners of postdorsal shield rather more angulate, and provided with
small pore near edge of shield; additional paired pores as figured. The pattern of pores on the anterodorsal shield is as in the original figure. Posterolateral corners of sternal shield without indentation near sternal seta III, and accordingly evenly convex, not concave. The posterior margin itself, however, is always quite concave. With six setae arranged 2.2.1.1 on genitoventral shield in addition to usual pair of genital setae, just behind which are a pair of small pores. Some ventral setae set on minute platelets. Chelicerae with fixed digit well sclerotized basally, but apically with delicate, leaf-like flap bearing two or three minute thorns. Movable digit rather broader, and also with retrorse thorns.

_Description of male._—Slightly smaller than female, idiosomal length 314μ, breadth 202μ. Dorsum, peritremes and legs as in female. _Venter_ with three shields. Intercoxal shield convex anteriorly, but concave around genital aperture; lateral margins with two concavities, one accepting coxae II, the other coxae III and IV. Surface of shield with few transverse striae, three pairs of pores, three pairs of sternal setae, and one pair of posterior setae (representing genital setae of female). Metasternal setae generally free in cuticle, but on one side of two specimens borne on slider, posteriorly directed extension of intercoxal shield. Ventral shield subcircular, with irregular margin, and from 28 to 30 setae. Anal plate as in female. Ventral cuticle with about sixteen pairs of setae. _Gnathosoma:_ Chelicerae with fixed digit much reduced. Movable digit fused with slender, but well-sclerotized spermatophore carrier.

_Description of late nymph._—Two specimens of this stage were examined, both of which were enclosed in the pelts of the early nymph described below. They were very pale and inadequate for illustration. Intercoxal shield and its setation as in male, but without genital aperture. Ventral area without ventral plate, but with numerous setae. With two contiguous dorsal shields, the posterior one being somewhat smaller than in adult. Peritremes as in early nymph. Otherwise similar to adult.

_Description of early nymph._—Weakly sclerotized and bluntly oval; idiosomal length 260μ, breadth 192μ. Hysterosoma not greatly developed behind coxae IV. _Dorsum_ with two shields. Anterior shield much the larger, with one pair of minute vertical setae. Posteriors setae weakly defined, but apparently transverse oval; with four pairs of setae in addition to a large and a very minute posterior pair. Dorsal cuticle with twelve pairs of setae arranged as shown. _Peritremes_ abbreviated and lateral, situated above coxae III and IV. _Venter_ with single intercoxal shield, which expands to level of coxae III and then tapers rapidly to a point between anterior edges of coxae IV; with three pairs of setae and two pairs of pores. Ventral cuticle with ten setae arranged as shown, the posterior pair flanking the anal plate. Otherwise similar to adult.

_Material examined._—Six females, two males (including allotype) and four nymphs from one of four bats, _Hipposideros bicolour albanensis_ Gray, Bramston Beach, North Queensland, 13.xii.1957.

_Remarks._—This species was originally described from two females from _Hipposideros cervinus_ (Gould) from Cape York Peninsula; the host identification should, however, be amended to _H. semoni_ Matschie.

Family CHEYTELITIDAE.

The only species of this family to be associated with bats in Australia is _Cheletonella vespertilionis_ Womersley, 1941, from an unidentifed South Australian bat. Possibly this predatory species plays a similar rôle on bats to that of _Cheyletiella parasitivorax_ (Mégnin) on rabbits.

Family MYOBIIDAE.

Four species of this family are recorded from Australian bats. They were all described by Womersley (1941) in the broad genus _Myobia_, but have since been reassigned to different genera.

_M. clara_, a slender species described without detailed collection data, is now placed in _Neomyobia_ Radford, 1948.

_M. chalinolobus_, a very stout species from _Chalinolobus gouldii_ (Gray) from South Australia is the genotype of _Pteracarus_ Jameson and Chow, 1952.
The third is a characteristic slender species with foliate dorsal setae, *M. miniopterus*, from *Miniopterus schreibersii bipotis* (Temminck) from South Australia (Womersley misspells the host genus and specific name of the mite). This species is accepted by Radford (1954) and Jameson (1955) as a synonym of *Myobia rhinolophia* Radford, 1940, from Africa, the genotype of *Calcarmyobia* Radford, 1948.

The fourth, *M. minima* from *C. gouldii*, is considered by Radford (1954) to be a deutonymph *incerti generis*.

Family TROMBICULIDAE.

Genus *Myotrombicula* Womersley and Heaslip.

This genus contains only a single species, *M. vespertilionis* Wom. & Heas., 1943, based on a single specimen lacking sensillae, and therefore of uncertain affinities. Nor is it certain that it is a true parasite of bats, the specimen having been found in the débris at the bottom of a jar of bats of uncertain origin.

Genus *Trombicula* Berlese.

*Trombicula quadriensis* Womersley and Heaslip, 1943.

This species was originally recorded (1943) from *Rattus assimilis* and *Hydromys chrysogaster* in Queensland, but its synonym, *T. chiroptera* Wom. & Heas., was described with collection data similar to those of *Myotrombicula* above. Womersley later (1952) recorded specimens of *T. quadriensis* (subsequently lost) from a bandicoot and a possum from North Queensland, while I have identified it from *Trichosurus vulpecula* (Kerr), D’Aguilar, S.E. Queensland, 4.iv.1957. Here again the evidence that this species is a bat parasite is inconclusive.


This species is close to *T. quadriensis* and was taken from *Chalinolobus gouldii* (Gray) occupying abandoned birds’ nests on Ayers Rock in Central Australia. A third closely related species is described below.

*Trombicula dasyphiloides*, n. sp. (δασιφιλοιδής, with rough rind). (Text-figs. 17–19.)

*Types*: Holotype and one paratype larva in Queensland Museum, Brisbane; one damaged paratype larva in Queensland Institute of Medical Research, Brisbane. All specimens from perineum of a bat, *Hipposideros scutatus* Matschlie, Lockhart River Mission, Cape York Peninsula, 13.vi.1956, M. J. Mackerras coll.

*Description of larva.*—A small and delicate species of ovate shape, without heavy sclerotization. *Body setation*: Dorsal setae simple, arranged 2.7.6.7 plus about 18 posterodorsal and caudal setae; HS 46μ long, DS 40μ long. With one pair of setae between both coxae II and III, and numerous ventral setae behind them, which are shorter (30-5μ long), and with longer ciliations than DS. *Gnathosoma*: Chelicerae stout, blade 23-2μ long, without teeth apart from usual tricuspid cap. Galeal setae well developed and ciliated. Maxillary setae strong and plumose. In addition to usual ventroexternal tarsala, the palpal formula is B.B.b(N)B.6B–N. The six setae on the palpal tarsus comprise one dorsal and five ventral setae. The former is by far the strongest, having a thick shaft and heavy distal ciliations. The five ventral setae, apart from the two on the inner ventral edge, are very weakly ciliated, and may occasionally be nude. Subterminala absent. Palpal claw three-pronged, the strong central prong flanked by small dorsal and ventral prongs. *Scutum* rather broader than long; subpentagonal. Anterior margin concave, with small convexity around AM seta, which is set slightly behind AL setae. Both AL and PL setae set on prominent “corners”. PL longer than AL and AM, which are subequal. Lateral margins quite concave, and posterior margin bluntly pointed medially. Surface of scutum roughened by heavy punctae, except for two subcircular areas behind sensillary bases and median zone behind AM seta; punctae weaker near “corners” and along extreme anterior margin. Sensillae set closer to level of PL than to that of AL setae, filamentous, and with about ten approximately paired ciliations on distal half of shaft. The standard data are given below. Eyes double, with anterior pair convex, about 15-3μ in diameter; posterior pair much weaker, about 7-3μ in diameter. The eyes are well separated.
from the scutum, but all three specimens are fully engorged and somewhat distorted. Legs all seven-segmented, with unisetose coxae. All tarsi with single basal bar; all tibiae with two semi-bars; genua I and II with bar and III with semi-bar. The special sensory setation is as follows: Tarsus I with pretarsala, subterminala and parasubterminala, tarsala and microtarsala. Tarsala exceedingly long (42-7μ) and slightly tapering. Tibia I with one stout distal tibiala (18-3μ), microtibiala, and a finer, more proximal tibiala. Genu I with two fine genualae and one microgenuala. Tarsus II

with pretarsala, tarsala (19-5μ) and microtarsala. Tibia II with one stout tibiala (22μ) and one fine tibiala. Genu II with one fine genuala. Tarsus III without specialized setation. Tibia and genu III with one mastiseta each, 36μ to 42μ long.

Standard data in micra of larval scutum of T. dasyploea, n. sp.

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<td>—</td>
<td>13-3</td>
<td>27-8</td>
<td>15-7</td>
<td>43-5</td>
<td>32-7</td>
<td>—</td>
<td>—</td>
<td>43-6</td>
<td>—</td>
</tr>
<tr>
<td>Means</td>
<td>41-9</td>
<td>61-1</td>
<td>13-7</td>
<td>27-0</td>
<td>16-1</td>
<td>43-1</td>
<td>32-7</td>
<td>35-2</td>
<td>34-7</td>
<td>46-8</td>
<td>60-5</td>
</tr>
</tbody>
</table>

Distribution.—Known only from the type host and locality on Cape York Peninsula.

Remarks.—T. dasyploea belongs to a characteristic group of parasites found chiefly on bats. They have roughened, heavily punctate scuta, and follow after couplet 68 of Womersley’s key (1952, p. 45). It is possible that these species may be congeneric with the lost genotype, T. minor Berlese. Of the species known from Australia and New Guinea, T. thomsoni Womersley, 1954, from Chalinolobus appears to be most closely related to the new species. The two may be separated by the scutal standard data and the number of dorsal setae.
Genus Trombigastia Vercammen-Grandjean and Brennan.

Trombigastia alcithoe, n. sp. (Text-figs. 20–24.)

Type: Holotype larva in Queensland Museum, Brisbane; from wing membrane of a bat, Hipposideros bicolor albanensis Gray, Bramston Beach, North Queensland, 13.xii.1957.

Description of larva.—A very small species even when engorged, but idiosomal measurements unavailable due to rupture during mounting procedure. Dorsal setae slender, to 37μ long; with barbules stronger on convex side. Total number of humeral,
dorsal and caudal setae about 70. Ventral setae shorter (to 27-7μ long), but rather more curved and with longer ciliations; about 32 in number. *Gnathosoma*: Chelicerae missing. Galeal setae nude and slender. Maxillary setae with about four slender ciliations. In addition to the usual ventroexternal tarsala, the palpal formula is B.b.bbb.7B-b. One of the two dorsal setae on the palpal tarsus is thick and heavily ciliated, while the other dorsal seta and the five ventral setae are weakly barbed or almost nude. Subterminala absent. Palpal claw 3-pronged, 20μ long. *Scutum* trapeziform. Anterior margin concave, with small convexity around base of AM seta, which is set somewhat behind level of the AL setae. Both AL and PL setae set on slight "corners". PL longer than AM, which is longer than AL. Lateral margins slightly concave; posterior margin almost rectilinear between PL setae. Surface of scutum with numerous small punctae, except behind AM seta and sensillary bases. Sensillae set much nearer level of PL setae than to that of AL setae; shaft somewhat thickened, but tapering distally; with barbules on basal third and ciliations on remainder of shaft. The standard data of the holotype are given below. Eyes convex and double, with anterior (17-1μ in diameter) larger than posterior (13-3μ in diameter). Legs all 7-segmented, with unisetose coxae. Intercoxal setae arranged in two pairs. All tibiae with basal and distal semibars. Tarsi II and III with basal semibar, but tarsus I with both basal and distal semibars. The special sensory setation is as follows. *Tarsus I* with pretarsala, subterminala and parasubterminala, tarsala and microtarsala. The tarsala is of moderate length (23-9μ), but does not reach the insertion of the subterminala. *Tibia I* with a stout and a slender tibiala and one microtibiala. *Genu I* with three slender genualae and microgenualae arranged as shown. *Tarsus II* with pretarsala, tarsala and microtarsala. *Tibia II* with a stout and a slender tibiala. *Genu II* with fine genualua. *Tarsus III* with mastitarsala bearing one or two weak basal barbules (the other setae of comparable length have numerous barbs along their entire length). *Tibia* and *genu III* with slender tibiala and genualua respectively.

*Standard data in micra of holotype of Trombigastia alcithoe, n. sp.*

<table>
<thead>
<tr>
<th>AW</th>
<th>PW</th>
<th>SB</th>
<th>ASB</th>
<th>PSB</th>
<th>SD</th>
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<th>AL</th>
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<tr>
<td>58.9</td>
<td>76.2</td>
<td>21.6</td>
<td>26.9</td>
<td>29.8</td>
<td>47.7</td>
<td>44.7</td>
<td>35.4</td>
<td>30.8</td>
<td>43.1</td>
<td>67.8</td>
</tr>
</tbody>
</table>

**Distribution.**—Known only from type host and locality in North Queensland.

**Remarks.**—There are six species in this compact genus according to Vercammen-Grandjean and Brennan (1957), three from N.E. Africa and Arabia, and three from Malaya. *T. alcithoe* is closest to *T. harrisoni* (Womersley, 1952) among the Malayan species, but may be separated by its larger scutal standard data and short tarsala I. The chelicerae of *T. alcithoe* are unknown, but all three Malayan species have the cheliceral blades short and broad-based.

This species and the two *Ichoronyssus* species above are named after the three daughters of Minyas, who were transformed into bats by Dionysus after declining to join his revels.

**Family ANOETIDAE.**

In 1942 Womersley described *Chiropteranoetus chalinolobus* from a single deutonymph from the débris at the bottom of a jar of unidentified bats. This species is not considered a true bat parasite, anecid deutonymphs (hypopi) being normally found effecting their dispersal on insects.

**Family LISTROPHORIDAE.**

**Genus ALABIDOCARPUS** Ewing.

**Alabidocarpus recurvus** (Womersley, 1943). (Text-figs. 25–26.)

**Description of female.**—Length 623–637μ. Capitulum free, with two posterodorsal angles heavily sclerotized. Postcapitular shield with midlateral margins extended downwards between legs I and II, forming part of sockets wherein these legs are articulated. With one or two pairs of minute setae immediately behind posterior margin of shield. Legs I and II much expanded apically, without caruncles, but with two setae each in posterodistal angles of expanded distal segment. With zone of striated cuticle behind each of these legs. Leg III with four movable segments, the
penultimate segment with two setae on outer surface, and the distal segment with an internal seta and three heavy apical claws, the outer one being twice as strong as the inner two. Leg IV also with four movable segments, but with only one seta on penultimate segment (the one in the posterodistal angle), and one inner seta and two apical claws on the distal segment, the outer being almost three times as long as the inner. All three smaller claws with three or four minute denticulations on outer distal (convex) edge. With two setae between coxae III and IV. Legs IV articulated on a curved ventral apodeme with median longitudinal strut. Above coxae III are a weak and a very strong seta (with their bases fused or discrete). Above these is a further minute seta, above which again is sometimes another minute seta. Body cuticle with 52 to 58 annulations dorsally and 28 to 35 ventrally. Apex of abdomen with two pairs of setae as shown, and possibly a third small pair just above these. Hysterosoma in all three specimens containing pale hexapod larva directed posteriorly, with structure as shown, although some minute setae are probably invisible. The unmodified posterior legs of the larva resemble the third pair of the adult, having three apical spines.

Description of male.—Exactly as in female illustrated, except for terminalia and number of body striations. Length 441 μ. With 36 to 38 annulations dorsally and none ventrally behind basal movable segment of leg IV. With two pairs of minute setae on posterolateral annulations. Apex of body almost immediately behind legs IV with two valves, each with sclerotized zone externally, with a heavily sclerotized bar running downwards and arching up forwardly. Inner surfaces of valves each with subcircular sucker and a single minute seta. Margins of valves with three pairs of heavy setae, the central pair the strongest (125 μ), and the other two pairs subequal (53–64 μ). On one side of the male from Palmerston, however, it is the dorsal one of the three setae that is strongest. Apodeme of leg IV as in female, but with median longitudinal strut longer, reaching to insertion of two paired setae between basal movable segments of leg IV. Almost immediately behind these setae (although not clear due to position assumed by mite) a short longitudinal sclerotized structure possibly representing penis; it is about as long but not as thick as the inner spur of tarsus IV. In Figure 26, legs IV are inserted almost immediately in front of the region figured, the hysterosoma being very short posteroventrally.

Material examined.—The holotype female from an unidentified bat from Bathurst, N.S.W., 13.iv.1934, S. L. Allman coll., and two pairs of adults from Rhinolophus megophyllus Gray, Yandina, 10.iv.1958, and Palmerston, 28.v.1958. All four new specimens were collected at the base of a different nasal vibrissa. The specimens illustrated are the pair from Yandina. The slight variations in cuticular setation are noted in the text. Otherwise I cannot separate the five specimens specifically.

Remarks.—Womersley’s Figure 4a does not show the minute setae on the body cuticle, nor are the 80 dorsal and 48 ventral annulations the correct number — this has led Lawrence (1948) into error in his key. The correct setation and relative sizes of the claws and apical segments of legs III and IV are shown in Figure 4a, yet the detailed figures of these structures in Figures 4b and 4c are incorrect. Legs III and IV have only four movable segments. A. recurvus is very close to A. nasicolus (Lawrence, 1938) from an African species of Rhinolophus. The two may perhaps be separated by the relative lengths of the terminal setae and the denticulations of the smaller tarsal claws. Miniopterus schreibersii blepitis was also present in the cave in which the host bats were taken; Alabidocarpus, however, appears typically to be found on the nasal vibrissae of Rhinolophus (see Lawrence, 1952).

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References.


