

FOURTEEN SPECIES OF *PTILONYSSUS*
FROM AUSTRALIAN BIRDS
(ACARINA, LAELAPIDAE)

BY

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Summary.

Fourteen species of rhinonyssine nasal mites, of which eight are new, are recorded from Australian passeriform birds — *Ptilonyssus colluricinclae* n. sp. from *Colluricincla phaea* (= *C. harmonica*) (Pachycephalidae); *P. cractici* n. sp. from *Cracticus nigrogularis* and *Gymnorhina tibicen* (Cracticidae); *P. motacillae* Fain from *Pachycephala rufiventris* (Pachycephalidae); *P. philemoni* n. sp. from *Philemon corniculatus* and *Entomyzon cyanotis* (Meliphagidae); *P. myzanthae* n. sp. and *P. thymanzae* n. sp. from both *Myzantha melanocephala* and *Anthochaera chrysoptera* (Meliphagidae); *P. meliphagae* n. sp. from *Meliphaga chrysops* (Meliphagidae); *P. echinatus* Berlese and Trouessart from *Hirundo neoxena* (Hirundinidae); *P. hirsti* de C. & P. from *Passer domesticus* (Ploceidae); *P. ruandae* Fain from *Zosterops lateralis* (colour phase *halmaturina*) (Zosteropidae); *P. trouessarti* (Hirst) from *Oriolus sagittatus* and *O. flavocinctus* (Oriolidae); *P. macclurei* Fain from *Rhipidura leucophrys* (Muscicapidae); *P. grallinae* n. sp. from *Grallina cyanoleuca* (Grallinidae); and *P. sphecotheris* n. sp. from *Sphecotheres vieilloti* (= *S. maxillaris*) (Oriolidae). *New synonymy* : *P. oriolis* Fain, 1956 equals *P. trouessarti* (Hirst, 1921).

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During recent field work with Messrs. I. D. FANNING, R.G. REES and J. S. WELCH, whose assistance and company are much appreciated, I took the opportunity to examine a few specimens each of some common Queensland birds for nasal mites. The fourteen species of *Ptilonyssus* collected, of which eight are new, are reported upon below. Relevant references are FAIN and HYLAND (1962) and DOMROW (1964).

I also wish to thank Mrs. G. W. PHILLIPS and Miss B. NOLAN for patiently typing this manuscript from my longhand draft, and Messrs. G. MACK and J. T. WOODS for kindly identifying some of the birds.

In addition to AF, RWS and RD (which are, of course, the initials of Drs. A. FAIN and R. W. STRANDTMANN, and myself), specimens from the type series have been lodged, where possible, in the following collections, abbreviated

NIC, National Insect Collection CSIRO, Canberra ;
BMNH, British Museum (Natural History), London ;
USNM, United States National Museum, Washington.

***Ptilonyssus colluricinclae* n. sp.**

Figs. 1, 2, 19.

Diagnosis. — Of the species of *Ptilonyssus* with an extensive opisthosomal shield, only one — *P. ploceanus* Fain — shows this shield distinctly lobed anterolaterally. However, *P. colluricinclae* carries eight slender setae on this shield against none in *P. ploceanus*. Further, the body setae of the former are, in general, elongate and slenderly tapering, but very short and knob-like in the latter.

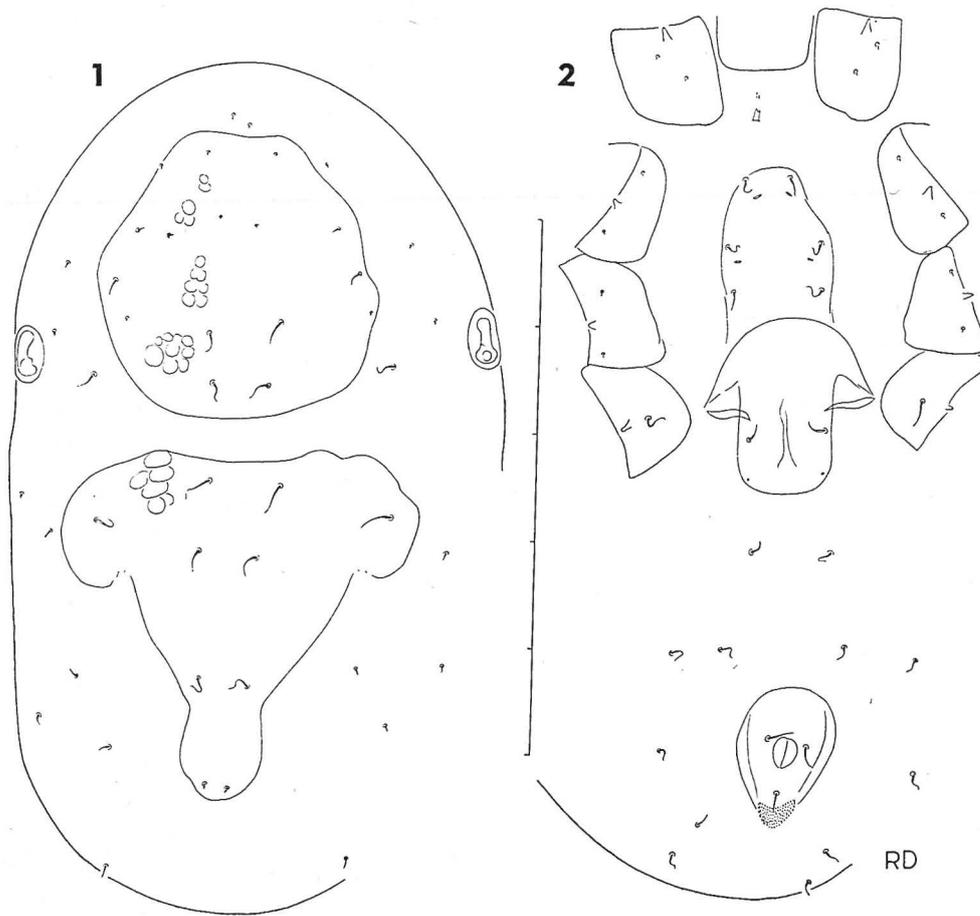
Types. — Holotype female and one paratype female from the grey shrike-thrush, *Colluricincla phaea* (Forster) = *C. harmonica* (Latham) (Pachycephalidae), Brisbane, Queensland, vii.1963. Holotype NIC ; paratype RD.

Female. — Length of idiosoma 795 μ . Podosomal shield quite well defined, somewhat uneven in shape, slightly wider than long, and narrower anteriorly. Vertical setae free in cuticle. Anterior half with eight minute setae in two transverse rows of four ; posterior half with two minute and six elongate setae arranged 2.4.2. Surface minutely granulate, with weakly marked areolations. Opisthosomal shield distinctly lobed anterolaterally ; broader than podosomal shield in anterior third, but distinctly tapering in middle third and parallel-sided in posterior third. With eight slender setae arranged as shown in addition to two small, spine-like pygidial setae posteriorly. With two areolate zones along anterior margin. Dorsal body cuticle with one elongate and two small setae flanking peritremalia and about six pairs of setae of variable length posterolaterally. Peritremalia as in *P. grillinae*, but without posterior sclerotization.

Sternal shield ill-defined, but with scale-like reticulations over entire surface. Three pairs of elongate sternal setae and two pairs of pores present on shield. Metasternal setae absent. Genital shield broad, rather truncate posteriorly, minutely granulate, but rather strongly sclerotized longitudinally in median line, with two elongate genital setae and weakly rayed operculum. Anal shield somewhat pear-shaped, with lateral margins more strongly sclerotized and distinct cribrum. Anus centrally placed, surrounded by three subequal anal setae, of which adanals lie level with anterior of anus. Ventral cuticle with six elongate setae arranged 2.4 in front of, and three similar pairs flanking, anus.

Coxal formula 2.2.2.1, the setae on I-III minute, but that on IV elongate. Coxae II without process on anterodorsal margin. Setae on remaining segments,

including genu III, undistinguished except on tarsi. Tarsus I with dorsodistal sensory zone; II-IV with six strong, slightly curved spurs, which, at their apex, curve distinctly while tapering rapidly. Of these, two are antero-, and four (set in a square), ventrodistal. Claws I almost straight, of uniform diameter except for tapering at extreme tip; II-IV normal. All set in strong pulvilli.



FIGS. 1-2. — *Ptilonyssus colluricinclae* n. sp.
Female. — 1, dorsum; 2, venter. (Each division on the scales equals 100 μ .)

Gnathosoma with two minute gnathosomal setae and deutosternum armed with about seven small denticles in single file. Hypostomal setae all similarly minute. Palpal trochanter without seta ventrally, and setae on other segments undistinguished. Tibia with two curved rods distally. Tarsus larger, not completely obscured dorsally by tibia, with several setae of variable length and fairly

strong bifid claw. Chelicerae attenuate in distal half, and slightly bulbous basally. Chelate portion occupying one-twentyfifth of total length. Minute tritosternal remnant present in both specimens.

***Ptilonyssus cractici* n. sp.**

Figs. 3, 4, 25.

Diagnosis. — *P. cractici* is a member of the *sairae* complex as discussed by FAIN (1959, 1962). It keys out near *P. estrildicola* Fain, but is a much larger species. The details of the setation of the podosomal shield are not reproduced clearly in Fain's half-tone plate, but the posterior margin is excavated, the mid-posterior pair of setae being left quite free in the cuticle. In *P. cractici*, however, the posterior border is only slightly emarginate, with these two setae always definitely on the shield.

The new species is also very near to *P. mimi* George, possessing exactly the same setal pattern on the podosomal shield, but may be separated from it by the shape of the anal shield, the position of the anal setae and the armature of tarsus I.

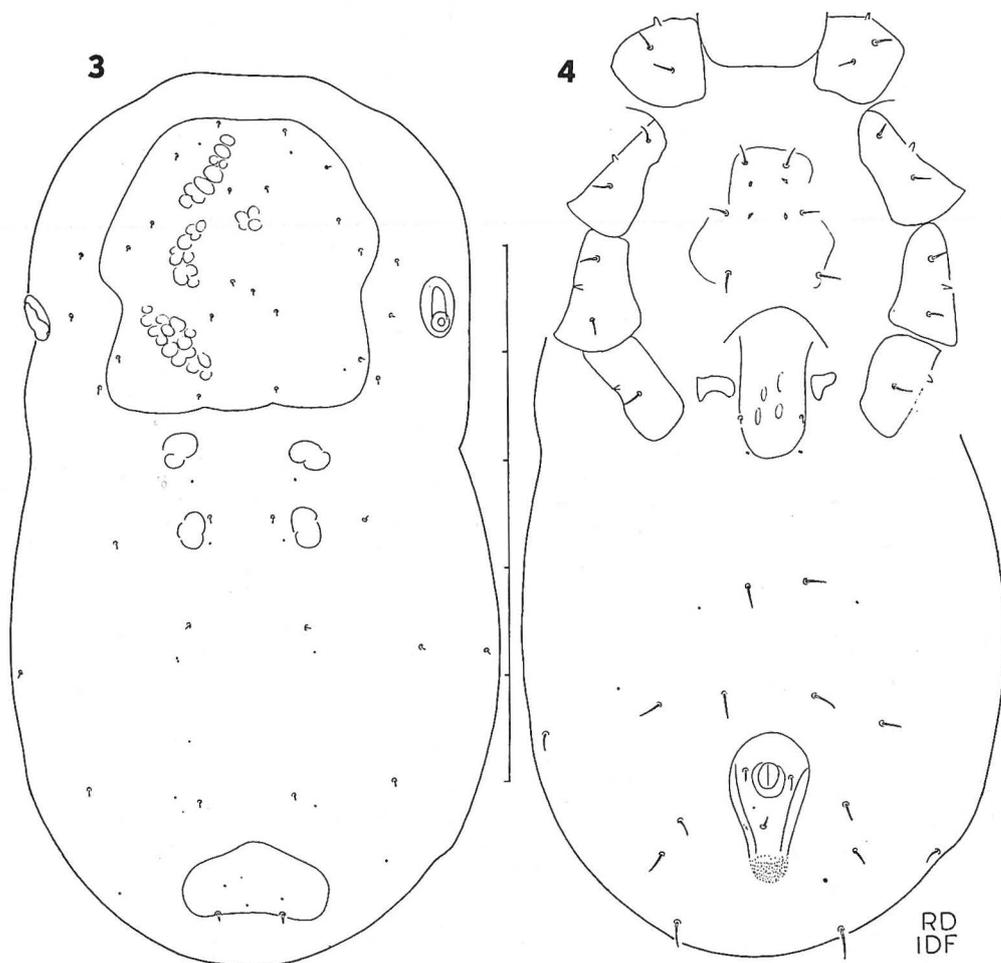
The remaining species of the *sairae* complex may be quickly separated from *P. cractici* by possessing one or more of the following characters—podosomal shield flanked posterolaterally by two pairs of long spinose setae; pygidial shield divided; metasternal setae present; adanal setae set behind anus; postanal seta lacking.

Types. — Holotype female from the black-backed magpie, *Gymnorhina tibicen* (Latham) (Cracticidae), Brisbane, Queensland, vii.1963; 23 paratype females and ten nymphs from *G. tibicen*, Condamine, Queensland, vi.1963; and nine paratype females and four nymphs from the pied butcherbird, *Cracticus nigrogularis* (Gould), Logan Village, Queensland, viii.1963. The specimen figured is from *Gymnorhina*. Holotype NIC; paratypes BMNH, USNM, AF, RWS and RD.

Female. — Length of idiosoma 715-850 μ . Podosomal shield quite well defined, subrectangular, but slightly narrower anteriorly. Lateral margins concave in posterior half; posterior margin weakly trilobed. With four pairs of minute setae anterolaterally (including vertical pair), six setae discally arranged 2.4, and four setae along posterolateral margin (midposterior pair distinctly on shield). Surface minutely granulate, and marked by muscle insertions. Middorsum with four areolate areas. Pygidial shield always entire, broader than long; anterior margin convex, and strongly so medially; posterior margin weakly concave. Pygidial setae spinose, preceded by two or three pores. Dorsal body cuticle with three pairs of minute setae flanking peritremalia and about fourteen setae arranged 4.6.4 posteriorly. Peritremalia as in *P. colluricinclae*.

Sternal shield very weakly defined, with six elongate, slender sternal setae submarginally and four distinct pores discally; quite textureless. Metasternal

setae absent. Genital shield fairly broad, rounded posteriorly, with two minute genital setae, areolations and weakly rayed operculum. Anal shield pear-shaped, more strongly sclerotized laterally and with distinct cribrum. Anus set in anterior half and flanked by three small anal setae. Adanal setae usually slightly in front of centre of anus in specimens from *Gymnorhina*, and almost at anterior of anus



FIGS. 3-4. — *Ptilonyssus cractici* n. sp. Female. — 3, dorsum ; 4, venter.

in specimens from *Cracticus* ; never behind center of anus except on one side of one specimen. Ventral cuticle with six setae arranged 2.4 in front of, and about four pairs of setae flanking, anus.

Coxal formula 2.2.2.1, the setae elongate and slender ; coxa II without process on anterodorsal margin. Remaining leg setation, except as noted, undistinguished, but slightly stronger on distal segments. Tarsus I bears dorsodis-

tally a sensory zone, and dorsobasally two setae (one inner spine-like and one outer slender and elongate). Genu III with four setae set in square dorsally, posterior pair with enlarged insertions. Claws I smaller than, but similar to, II to IV; all set in strong pulvilli.

Gnathobase with two gnathosomal setae and deutosternum armed with about eight denticles in single file. Hypostomal setae subequal to gnathosomal pair except for decidedly smaller outer posterior pair. Palpal trochanter with slender seta; not expanded ventrally at inner distal angle. Setae on other segments of variable size, some quite spinose. Tibia with two rods distally. Tarsus completely obscured dorsally by tibia; with minute bifid claw. Chelicerae very attenuate in distal two-thirds, bulbous basally; chelate portion occupying one-thirtyfifth of total length.

Ptilonyssus motacillae Fain.

Figs. 29-31.

Ptilonyssus motacillae FAIN, 1956, *Rev. Zool. Bot. afr.* 53 : 143; 1957, *Ann. Mus. Roy. Congo belge, Tervuren* 60 : 104; 1959, *J. ent. Soc. S. Afr.* 22 : 24.

Material. — Six females from the rufous whistler, *Pachycephala rufiventris* (Latham) (Pachycephalidae), Mt. Cotton and Samford, Queensland, x. and xi. 1963, a new record for Australia.

Notes. — My specimens agree closely with FAIN's detailed figures and measurements, both for the dorsal and ventral surfaces as well as the gnathosoma. Minor variations and/or additional notes are as follows. Additional pair of closely set vertical setae on or near anterior margin of podosomal shield. Ventral body cuticle with additional pair of setae at extreme posterior; two pairs of sternal pores present. Posterior pair of setae on dorsum of genu III set in enlarged alveoli. Anterior hypostomal setae present, only slightly smaller than inner posterior pair; outer posterior pair minute and cone-like. Palpal tarsus with minute two-tined claw.

Ptilonyssus philemoni n. sp.

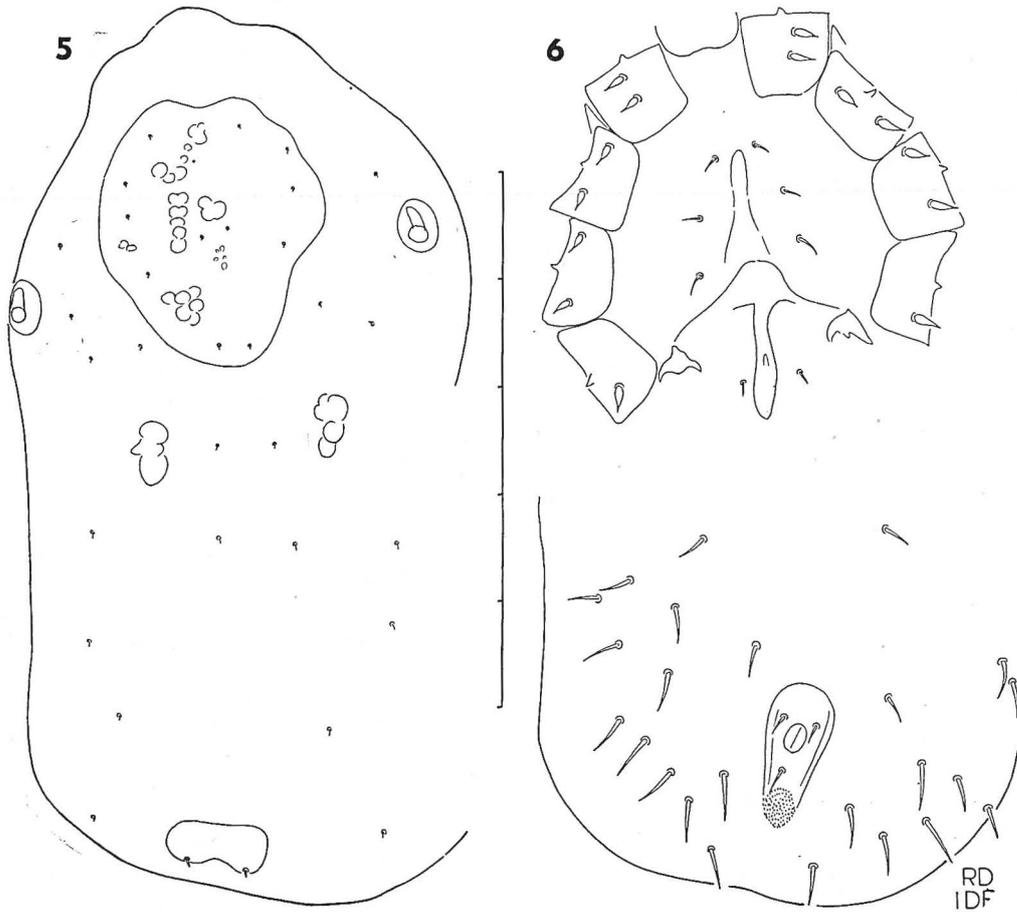
Figs. 5, 6, 17, 18, 26.

Diagnosis. — In the general setation of the body, as well as the slender genital shield and chelicerae, *P. philemoni* is closely related to *P. myzanthae* n. sp. The two species may, however, be separated by the setation of the podosomal shield, the degree of reduction of the pygidial shield, and the armature of the outer distal angle of the gnathobase (fused palpal coxae).

Types. — Holotype female and ten paratype females from the noisy friar-bird, *Philemon corniculatus* (Latham) (Meliphagidae), Logan Village, Queensland,

viii.1963; allotype male, 28 paratype females and one nymph from the blue-faced honeyeater, *Entomyzon cyanotis* (Latham) (Meliphagidae), Condamine and Logan Village, Queensland, vii. and viii.1963. The female figured is from *Philemon*. Holotype and allotype NIC; paratypes BMNH, USNM, AF, RWS and RD.

Also nineteen females and one protonymph containing developing deutonymph, *P. corniculatus*, Logan Village and Palen Creek, Q., xi.1963.



FIGS. 5-6. — *Ptilonyssus philemoni* n. sp. Female. — 5, dorsum; 6, venter.

Female. — Length of idiosoma 660-792 μ . Podosomal shield rather longer than wide, and narrower in posterior half; outline well defined, surface minutely granulate and marked by muscle insertions. On shield are present six pairs of very minute setae and one or two pores, but minor variations are common, and even one or both of inner posterior pair of eight minute setae between peritremalia and shield may be taken in by posterolateral angle of shield. Middorsum with two areolate shieldlets. Pygidial shield entire, rather straight ante-

riorly, but concave posteriorly; with two small spinose pygidial setae. Dorsal body cuticle also with two minute setae between middorsal areolations and ten similar setae behind these arranged 4.2.2.2 as figured. Peritremalia as in *P. colluricinclae*.

Sternal shield weakly defined, virtually textureless, without pores, but flanked by six spinose sternal setae. Metasternal setae absent. Genital shield narrow, with granulations in elongate pattern, trace of areolation and weakly rayed operculum; genital setae set free in nearby cuticle. Anal shield somewhat pear-shaped, more strongly sclerotized laterally, and with terminal cribrum. Anus set well back from anterior margin, flanked by three anal setae; adanals level with or just in front of anterior of anus. Ventral cuticle armed with about twelve pairs of spinose setae surrounding anal shield. These setae vary in length, and may be rather shorter than figured.

Coxal formula 2.2.2.1, the setae swollen basally, and tapering rapidly to spinose tip rather than filament as in *P. myzanthae*. (In many specimens, especially on coxae I, coxal setae not quite as swollen as in specimen figured.) Coxa II with process on anterodorsal margin. Trochanteral setae similar to coxal setae, but remainder of setae on anteroventral aspect of legs rather weaker, even at tips of tarsi. Setae on dorsum of legs small, unmodified on genu III, and rather more elongate on tarsi. Tarsus I with dorsodistal sensory zone. Claws and pulvilli undistinguished.

Gnathobase with two gnathosomal setae and deutosternum armed with about eight small denticles in single file; outer distal angle armed with circlet of spinules, cf. *Mesonyssoides ixoreus* (Strandtmann and Clifford). All three pairs of hypostomal setae present, subequal, but rather smaller than gnathosomal pair. Palpal trochanter with slender seta ventrally, and remainder of palpal setation also undistinguished. Tibia with two rods distally; tarsus small, completely obscured dorsally by tibia, with about five setae of variable length, but without claw. Chelicerae not distinctly bulbous basally; chelate portion occupying one-thirtieth of total length.

Male. — Length of idiosoma 462 μ . Podosomal shield rather broader posteriorly than in ♀, but with essentially the same setation. Middorsum with weakly defined transverse, kidney-shaped shield bearing four minute setae and anterolateral areolations. Pygidial shield as in ♀ posteriorly, but more extensive and strongly convex anteriorly. I fancy I detect weak platelet with two setae on one side of pygidial shield. Dorsal body cuticle (including PL platelet) with four or five pairs of minute setae. Peritremalia as in female.

Sternal area with four pairs of quite small setae; metasternal pair absent; cuticle quite granulate between SI and II, but no other sclerotization evident. Genital aperture in front of SI. Remainder of venter as in female, but anal shield flanked by five or six spinose setae.

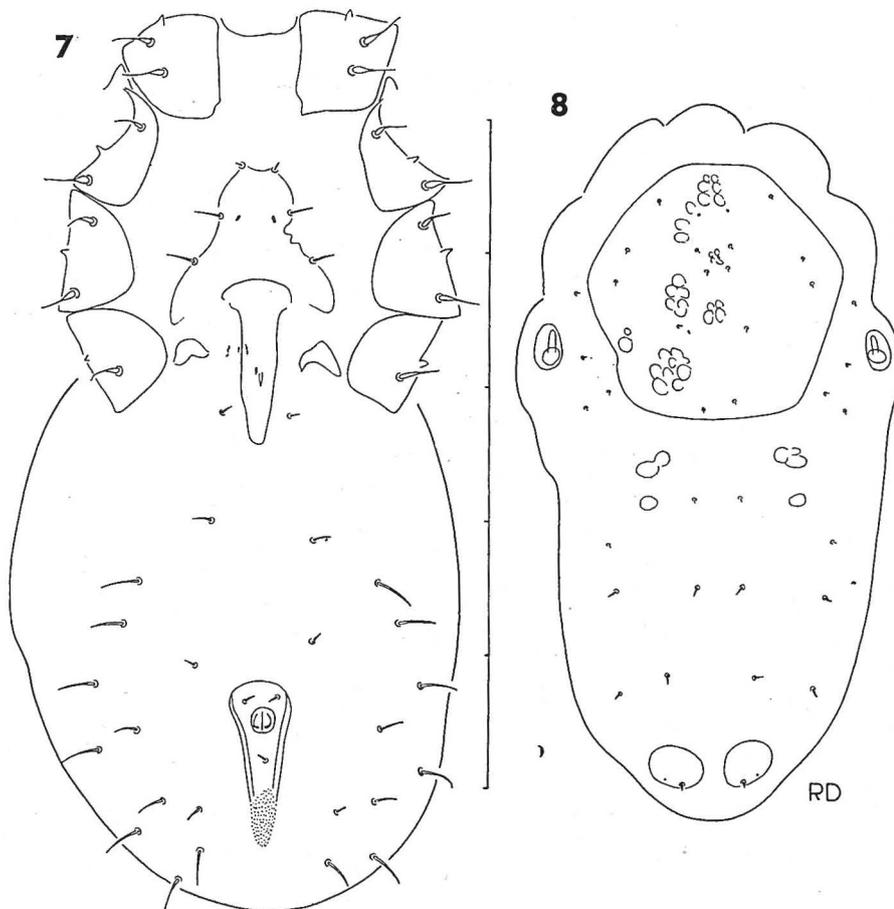
Legs and gnathosoma essentially as in female, but outer distal angle of latter

hardly, if at all, spinose. Chelicerae with shaft of uniform diameter. Fixed digit hyaline; spermatophore-carrier much more strongly sclerotized, apparently tubular. Chelate portion occupying two-fifths of total length.

***Ptilonyssus myzanthae* n. sp.**

Figs. 7, 8, 20.

Diagnosis. — *P. myzanthae* has coxal setae very similar to those of *P. mariaecastroae* Fain (amend., Article 31 a), and also shares the following characters with this species and *P. aureliani* Fain — genital shield narrow, adanal setae set in front of anus, pygidial shield divided. However, *P. myzanthae* is easily separated from both these species by the shape of the podosomal shield and chelicerae, and further, from the former by its peritremalia, and the latter by the shape and position of the genital setae.



FIGS. 7-8. — *Ptilonyssus myzanthae* n. sp. Female. — 7, venter; 8, dorsum.

Types. — Holotype female, three paratype females and two nymphs from the noisy miner, *Myzantha melanocephala* (Latham) (Meliphagidae), Condamine, Queensland, vi. and vii.1963. Holotype NIC; paratypes BMNH and RD.

Also two females, little wattle bird, *Anthochaera chrysoptera* (Latham) (Meliphagidae), Palen Ck., xi.1963.

Female. — Length of idiosoma 539-649 μ . Podosomal shield fairly well outlined, subhexagonal, with anterior margin the shortest, and tendency to concavity posterolaterally. Surface minutely granular, with areolate areas and seven pairs of minute setae and one pair of pores arranged as figured. Middorsum with four areolate areas. Pygidial shield divided, each half rounded, with pore and spinose seta posteriorly. Dorsal body cuticle with four pairs of minute setae between podosomal shield and peritremalia (which latter are as in *P. colluricinclae*), and twelve setae in three rows of four posteriorly (first row minute, other two rows somewhat stronger).

Sternal shield weakly defined, virtually textureless, bearing two pores and six submarginal tapering setae, of which SI are much weaker than SII and III. Metasternal setae absent. Genital shield narrow, areolate, with granulations in elongate arrangement, and weakly rayed operculum. Genital setae tapering, set quite free in cuticle. Anal shield quite elongate, rounded anteriorly, and more strongly sclerotized laterally. Cribrum present. Anus set in anterior half, preceded by adanal setae and followed by postanal seta, all of which are small and subequal. Encircling the anal plate on ventral body cuticle are about twelve pairs of spinose tapering setae, which are stronger posterolaterally.

Coxal formula 2.2.2.1, the setae somewhat swollen in basal half, and then rapidly tapering into terminal filament. Coxa II with process on anterodorsal margin. Setae on ventral aspect of legs rather similar to coxal setae, but less swollen basally; those on dorsal aspect much smaller. Setation of genu III normal. Tarsus I with dorsodistal sensory area. Tarsi II-IV (certainly III and IV) with two somewhat stronger setae ventrodistally. Claws and pulvilli all normal.

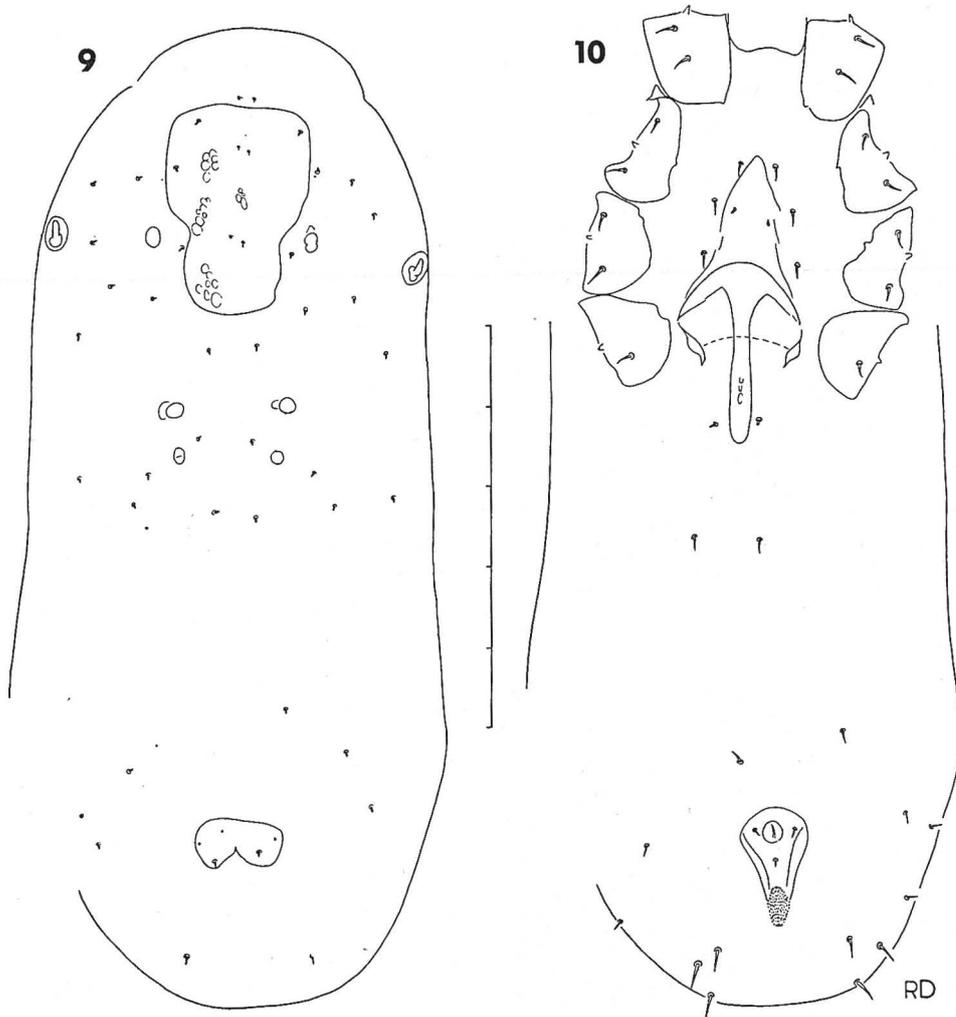
Gnathobase with two slender, elongate gnathosomal setae and about five weak deutosternal denticles in single file. Hypostomal setae very much weaker, anterior pair apparently absent. Palpal trochanter with slender seta ventrally and other segments also with undistinguished setation. Tibia with two distal rods; tarsus completely obscured dorsally by tibia, with several setae of variable length and weak bifid claw. Chelicerae gradually tapering to apex, not distinctly bulbous basally. Chelate portion occupying one-thirtieth of total length.

***Ptilonyssus thymanzae* n. sp.**

Figs. 9, 10, 22.

Diagnosis. — In addition to *P. echinatus* Berlese and Trouessart, which may be separated from *P. thymanzae* by its inflated leg setae, three other species pos-

sess accessory dorsal platelets flanking the podosomal shield — *P. aureliani* Fain, *P. traubi* Strandtmann and *P. tachycinetae* George. The first of these has the adanal setae anteriorly placed as in *P. thymanzae*, but may be separated by its strong body setation, the location of the genital setae on the genital shield, and



FIGS. 9-10. — *Ptilonyssus thymanzae* n. sp. Female. — 9, dorsum ; 10, venter.

its divided pygidial plate. The latter two species have the adanal setae set behind the anus, and may be further separated by the setation of the podosomal shield in both species, and by the armature of the palpi and tarsi II-IV in *P. traubi*.

Types. — Holotype female, five paratype females and two nymphs from the noisy miner, *Myzantha melanocephala* (Latham) (Meliphagidae), Condamine, Queensland, vii.1963. Holotype NIC ; paratypes BMNH, AF, RWS and RD.

Also six females and one male (fig. 37), *M. melanocephala*, Logan Village, xi.1963; two females, *A. chrysoptera*, Palen Ck., xi.1963. (These latter two females show the podosomal shield taking in the accessory dorsal shieldlets and one or two marginal cuticular setae on each side, as in the ♂ sex.)

Female. — Length of idiosoma 737 μ in unengorged specimen, and from 1100 to 1210 μ in fully fed specimens; humped midlaterally much as in *P. lobatus* Strandmann. Podosomal shield longer than wide, narrower and more irregularly outlined in posterior half, with four pairs of setae arranged as shown. Surface minutely granular and marked by muscle insertions; flanked laterally by two small accessory platelets. Vertical setae free in cuticle. Middorsum with four areolate areas. Pygidial shield transverse, entire, but eroded posteromedially; with two spinose setae posteriorly and two or three pores. Dorsal body cuticle with eight pairs of setae flanking podosomal shield posterolaterally, a compound row of ten setae middorsally, and three or four pairs flanking pygidial shield. These setae, as well as those on podosomal shield are minute, blunt pegs. Peritremalia as in *P. colluricinclae*.

Sternal shield ill defined, minutely granular, flanked by six tapering sternal setae and two distinct pores. Metasternal setae absent. Genital shield narrow, with areolations, longitudinal granulations, and weakly rayed operculum. Genital setae peg-like, set free in cuticle. Anal shield elongate pear-shaped, with anus anteriorly placed and distinct cribrum. Shield more strongly sclerotized laterally. Adanal setae small, set just in front of middle of anus; subequal to post-anal seta. Ventral cuticle with six slender setae arranged 2.4 in front of, and four or five pairs flanking, anus.

Coxal formula 2.2.2.1, setae stout, but evenly tapering to definite point. Remainder of leg setation, including genu III, undistinguished except for sensory zone dorsodistally on tarsus I and some slightly stronger setae on tarsi II-IV, including two ventrodistals which taper rather more abruptly at their apex. Claws and pulvilli all normal.

Gnathobase with two gnathosomal setae and about eight denticles in single file. All three pairs of hypostomal setae present, but outer posterior pair very minute. Palpal trochanter with strong seta ventrally, but all other palpal setae considerably weaker. Tibia with two distal rods; tarsus obscured dorsally by tibia, with several setae of varying length and minute bifid claw. Chelate portion occupying one-thirtieth of total length.

***Ptilonyssus meliphagae* n. sp.**

Figs. 32-36.

Diagnosis. — See that given for *P. thymanzae* n. sp., to which *P. meliphagae* is closely related. The two species may, however, be easily separated by the following characters — the shape of the podosomal and anal shields, the disposition of the anal setae, and the anterodorsal process on coxa II.

Types. — Holotype female from the yellow-faced honeyeater, *Meliphaga chrysops* (Latham) (Meliphagidae), Mt. Cotton, Queensland, x.1963. Holotype NIC.

Female. — A very large species in life, length of idiosoma perhaps 1750 μ . Podosomal region with one pair of angulate, and three pairs of larger, rounded callosities laterally, the former possibly bearing the peritremes; also median prominence. Opisthosomal region with ventrally directed outgrowth mid-posteriorly, but whether anus is borne terminally on this process is not known. Podosomal shield relatively small, elongate and subrectangular; preceded by two, and bearing six peg-like setae; flanked by two oval shieldlets and several pairs of peg-like setae. Middorsum with four areolate areas and several pairs of peg-like setae. Pygidium damaged, possibly with two setae even stronger than those flanking anus; pygidial shield not detected. Peritremalia as in *P. colluricinclae*.

Sternal shield elongate, minutely granulose; SI and SII submarginal, SIII apparently free in cuticle. SII (at least) accompanied by pair of pores. Metasternal setae absent. Genital shield very narrow, with elongate muscle insertions, longitudinal striae, and weakly rayed operculum. Genital setae set free in cuticle. Anal shield elongate, more strongly sclerotized laterally; anterior margin with small, pointed, subdermal apodeme. Cribrum expanded. Anus set close to front of shield, preceding three irregularly arranged and slenderly tapering anal setae. Ventral body cuticle with pair of spinose setae between genital and anal shields, and eight to ten pairs of similar, but stronger setae flanking anal shield.

Legs. — Coxal formula 2.2.2.1, the setae swollen basally, except anterior seta on coxa II, which latter has very strong anterodorsal process. Leg setation spinose in general, but weaker dorsally. Setae on dorsum of genu III normal. Tarsus I with dorsodistal sensory area; tarsi II-IV each with two strong ventrodistal spurs. Claws and pulvilli normal.

Gnathobase with two slender gnathosomal setae and deutosternum with twelve denticles in single file. Anterior hypostomal setae somewhat smaller than inner posterior pair, which are set rather in front of smaller outer posterior pair. Palpal trochanter with long, somewhat basally swollen seta ventrally; remainder of palpal setation undistinguished except for two dorsodistal rods on tibia. Tarsus with several short spinose setae, but claw absent. Chelicerae swollen in basal third, but attenuate distally; chelate portion occupying one-thirtieth of total length.

Ptilonyssus echinatus Berlese and Trouessart.

Ptilonyssus echinatus Berlese and Trouessart, 1889, *Bull. Biblioth. scient. Ouest* 2 : 129 (I have been unable to check this reference, which is given as listed in *Index-catalogue of medical and veterinary zoology*, U. S. Dept. Agriculture, 1938. Many authors give *Bull. Soc. Sci. nat. Ouest* 2 (1889), but this is incorrect. The library of the Royal Society of Queensland (Brisbane) has a complete run of this periodical — it did not commence publication until 1891, and none of the first ten

volumes contain the article in question, *Diagnoses d'acariens nouveaux ou peu connus*); ZUMPT and TILL, 1955, *J. ent. Soc. S. Afr.* 18 : 74; STRANDTMANN, 1960, *J. Kansas ent. Soc.* 33 : 146; GEORGE, 1961, *J. Kansas ent. Soc.* 34 : 114.

One female (with divided pygidial shield) from the welcome swallow, *Hirundo neoxena* Gould (Hirundinidae), Brisbane, xii.1963, a new record for Australia. Also recorded from various swallows in Europe, U. S. A., Africa and Thailand (type host *H. rustica*).

Ptilonyssus hirsti de Castro and Pereira.

Ptilonyssus hirsti DE CASTRO and PEREIRA, 1947, *Arq. Inst. biol.* 18 : 129; PORTER and STRANDTMANN, 1952, *Texas J. Sci.* 4 : 394.

One protonymph from the type host, the house sparrow, *Passer domesticus* Linné (Ploceidae), Brisbane, x.1963, a new record for Australia. Also recorded from same host in Europe and U. S. A., and *P. griseus* in Africa.

Ptilonyssus ruandae Fain.

Ptilonyssus ruandae FAIN, 1956, *Rev. Zool. Bot. afr.* 53 : 395; 1957, *Ann. Mus. Roy. Congo belge, Tervuren* 60 : 109.

One ♀ from the grey-backed silvereye, *Zosterops halmaturina* Campbell, now considered but a colour phase of the grey-breasted silvereye, *Z. lateralis* (Latham) (Zosteropidae), Brisbane, xi.1963, a new record for Australia. Originally described from *Z. senegalensis*, Africa; also *P. r. alcippei* from a babbler, *Alcippe nipalensis peracensis* (Timaliidae), Malaya (FAIN and NADCHATRAM, 1962, *Bull. Ann. Soc. Roy. Ent. Belg.* 98 : 279).

Ptilonyssus trouessarti (Hirst).

Rhinonyssoides trouessarti Hirst, 1921, *Proc. zool. Soc. Lond.* p. 770; *Ptilonyssus trouessarti*, FAIN and HYLAND, 1962, *Ann. Mag. nat. Hist.* (13) 5 : 346.

Ptilonyssus orioli FAIN, 1956, *Rev. Zool. Bot. afr.* 53 : 144; 1957, *Ann. Mus. Roy. Congo belge, Tervuren* 60 : 114; STRANDTMANN, 1960, *J. Kansas ent. Soc.* 33 : 150. *New synonymy.*

Two ♀♀ from the olive-backed oriole, *Oriolus sagittatus* (Latham) (Oriolidae), Logan Village, xi.1963, and four ♀♀, one deutonymph and two protonymphs from the yellow oriole, *O. flavocinctus* (King), Mitchell River, N. Q., 18.xi.1963, H. A. Standfast. The former specimens agree exactly the two published descriptions of *P. trouessarti*, and the latter rather with Strandtmann's figures of *P. orioli*. I believe the differences to be infraspecific. The two orioles are sympatric in part

of their range, the former extending from northern to southeastern Australia, while the latter is confined to tropical northern Australia from Derby (West Australia) to Cardwell (Queensland).

P. trouessarti was originally described from the southern fig-bird, *Sphecotheses vieilloti* Vigors and Horsfield (= *S. maxillaris* Gray), also an oriolid, and of which the female is strikingly similar to the olive-backed oriole. I first became aware of this on a recent field trip. My three companions, all of whom have recently handled southern fig-birds (they feed in a loquat tree outside my laboratory window, and a pair are at the moment of writing — late November — rearing a brood in a eucalypt tree nearby), came back to camp with some birds they said were “fig-birds”, but whose beaks reminded me at once of the yellow oriole I had seen a few days before. Cayley’s coloured illustrations (*What bird is that?*, Plate III 6 and 7 A, Angus and Robertson, Sydney, 3rd edition, 1959), confirmed the similarity, and I am now convinced that the original host of *P. trouessarti* was *O. sagittatus* and not *S. vieilloti* (♀), see fig. 38, photographed by Miss Jeannine BEVAN through the courtesy of Mr. J. T. WOODS, Queensland Museum. The only nasal mite I have taken from *S. vieilloti* is *P. sphecothesis* n. sp., on two occasions.

Ptilonyssus macclurei Fain.

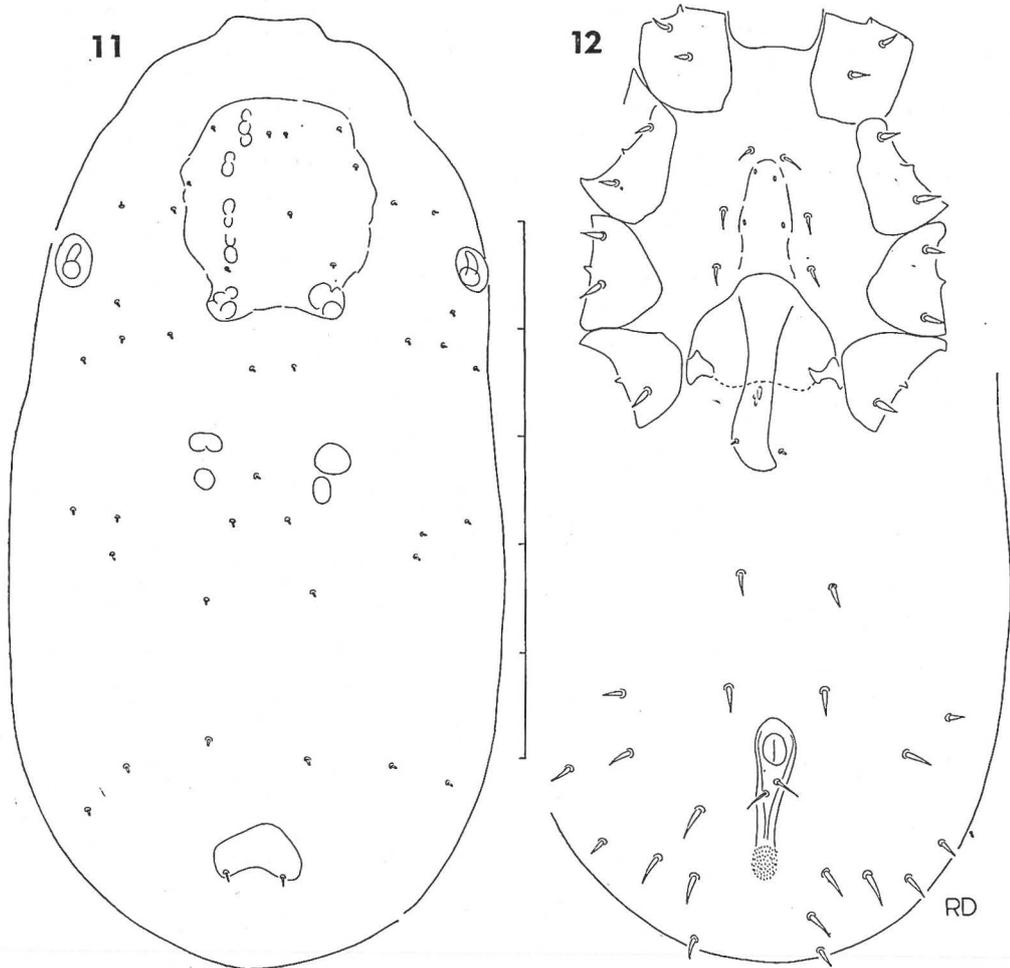
Figs. 11, 12, 21.

Four females and one nymph from the willie wagtail, *Rhipidura leucophrys* (Latham) (Muscicapidae), Brisbane and Palen Creek, Queensland, viii. and xi. 1963, a new record for Australia.

Female. — Length of idiosoma 902 μ . Podosomal shield rather weakly defined, minutely granulate, and marked by muscle insertions, including two areas in rounded posterolateral angles. Anterior margin slightly convex; lateral margins longer, irregularly convex; posterior margin weakly concave. Nine setae are borne in regular pattern on shield as figured. Middorsum with four areolations. Pygidial shield entire, convex anteriorly and laterally, and concave posteriorly; with two small spinose setae. Body cuticle with seven pairs of setae between and around podosomal shield and peritremalia, middorsum with band of eleven setae, and posterior with row of six setae. All dorsal setae, except pygidials, minute and peg-like. Peritremalia as in *P. colluricinclae*.

Sternal shield weakly outlined, minutely granulate, bearing four pores and flanked by six spinose setae. Metasternal setae absent. Genital shield narrow, with granulations in elongate arrangement, small areolations and weakly rayed operculum. One peg-like genital seta on shield, one off. Anal shield elongate, more strongly sclerotized laterally, and with cribrum occupying about one-fifth of total length of shield. Anus placed well forward and in front of rather slender adanal setae; postanal seta lacking. Anal shield preceded by six strong spinose setae arranged 2.4, and flanked by seven pairs of similar setae.

Coxal formula 2.2.2.1, the setae spinose and slightly expanded basally ; coxa II with process on anterodorsal margin. Setae on anteroventral face of other leg segments somewhat similar, but weaker, especially so on distal segments of legs I and II. Dorsal setae, including those on genu III, minute and unmodified, but long and slender on tarsi. Tarsus I with dorsodistal sensory zone. Tarsi II-IV



FIGS. 11-12. — *Ptilonyssus macclurei* Fain.
Female. — 11, dorsum ; 12, venter.

with two blunt ventrodiscal spurs, and III-IV with three rather more pointed, erect setae on anterior edge. Claws and pulvilli not of note.

Gnathobase with two short gnathosomal setae and nine deutosternal denticles in single file. Anterior and posterior hypostomal setae much weaker than inner posterior pair. Palpal trochanter with strong seta ventrally, but other palpal

setae weaker. Tibia with two distal rods. Tarsus obscured dorsally by tibia, with several setae of variable length and minute bifid claw. Chelicerae bulbous basally, with chelate portion occupying one-thirtieth of total length.

***Ptilonyssus grallinae* n. sp.**

Figs. 13, 14, 24, 27, 28.

Diagnosis. — In addition to *P. grallinae*, two other species have a broad genital shield and the postanal seta absent — *P. lanii* Zumpt & Till and *P. perisorei* George. The former species, possessing spinose body setae, may at once be dismissed, but the latter does possess blunt, if not peg-like, body setae. However, *P. grallinae* may easily be separated from *P. perisorei* by its elongate anal shield and the shape of the dorsal shields in both sexes, as well as by the shape of the chelicerae and the armature of genu III in the female.

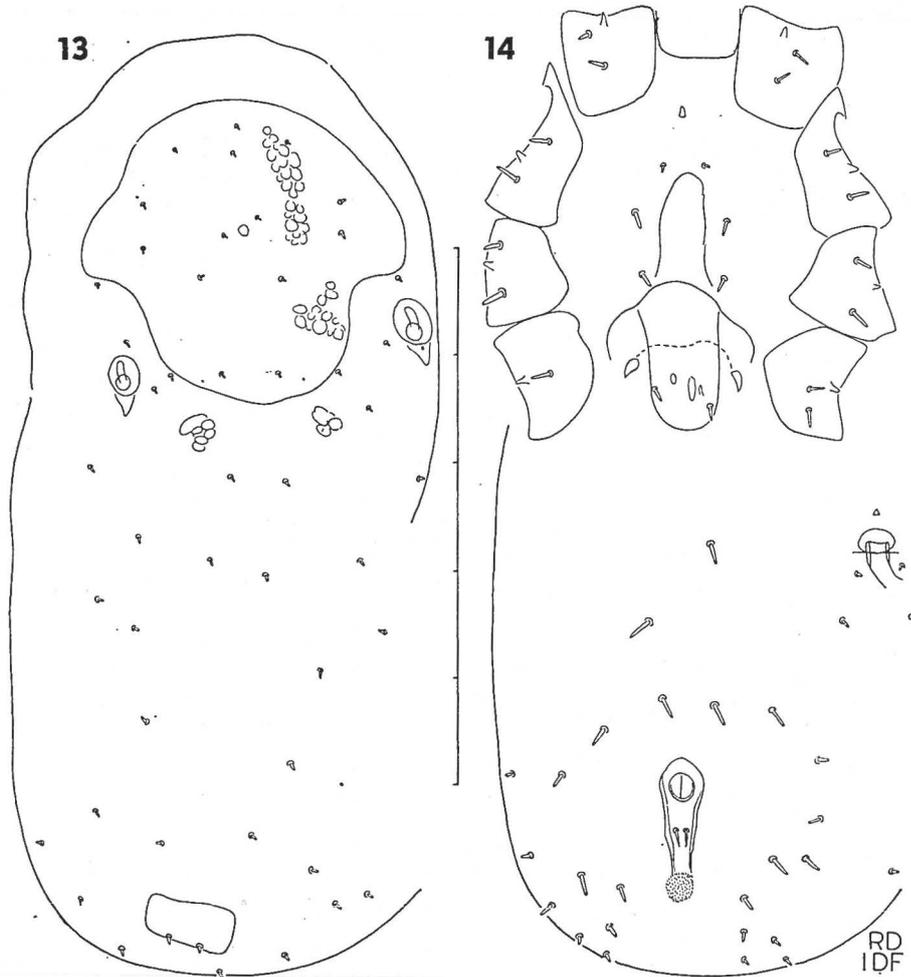
Types. — Holotype female, allotype male, five paratype females and four nymphs from the magpie-lark, *Grallina cyanoleuca* (Latham) (Grallinidae), Brisbane and Condamine, Queensland, vii. and viii. 1963. Holotype and allotype NIC; paratypes AF, RWS and RD.

Female. — Length of idiosoma 715-870 μ . Podosomal shield well defined, evenly rounded both in anterior and posterior halves, but radius of former arc larger than latter because of strong posterolateral emarginations; with fourteen paired peg-like setae arranged as figured. Surface minutely granulate, with areolations (muscle insertions) and some trace of reticulation. Middorsum with two areolate areas. Pygidial shield subrectangular, twice as wide as long, minutely granulate, and with two peg-like setae and pores (in one specimen anterior margin rather rounded; in another posterior somewhat bi-lobed). Dorsal body cuticle with four pairs of peg-like setae between podosomal shield and peritremalia, and about twelve more pairs arranged as figured on remainder of dorsum. These setae are all considerably smaller than those on venter. Stigmata with short peritremes, surrounded by oval platelets; with small sclerotization posteriorly.

Sternal shield ill-defined, virtually textureless and evident only because of lack of cuticular striae; without pores, but flanked by six sternal setae, anterior pair by far the weakest. Metasternal setae absent. Genital shield wider, evenly rounded posteriorly, with two setae, areolations and weakly rayed operculum. Anal shield very elongate, with lateral margins quite strongly sclerotized. Anus well forward from adanal setae; postanal seta absent, but cribrum present. Ventral cuticle with six setae arranged 2.4 in front of, and about ten pairs flanking, anus. All setae on venter peg-like, except adanals, which taper to definite point.

Coxal formula 2.2.2.1, setae peg-like (on one side of one specimen coxa IV bears two setae); coxae II with process on anterodorsal margin. All trochanters and most other leg segments, including tarsi II-IV also with peg-like setae, especially

anteroventrally. Setae on dorsum of middle leg segments, including genu III, inconspicuous and undistinguished. All tarsi with some elongate slenderly tapering setae, especially dorsally, and two prominent curved spines ventrodistally. Tarsus I with dorsodistal sensory zone. Claws I expanded basally, evenly curved and tapering distally as on other legs. Claws set in strong pulvilli.



FIGS. 13-14. — *Ptilonyssus grillinae* n. sp. Female. — 13, dorsum; 14, venter (with inset showing tritosternum, genital aperture and SI-II of male).

Gnathobase with two gnathosomal setae (one occasionally lacking) and deutosternum armed with about six denticles in single file. Hypostomal setae subequal to gnathosomal setae except for rather smaller outer posterior pair. Palpal trochanter with small peg-like seta ventrally, but setae on other segments, while stronger, all tapering. Tibia with two curved, rod-like setae distally. Tarsus

small, completely obscured dorsally by tibia, with about five slender setae of varying length and weak, bifid claw. Chelicerae more attenuate in distal half, but not distinctly bulbous basally; chelate portion occupying one-twentyfifth of total length. Minute tritosternal remnant always present in all stages.

Male. — Length of idiosoma 705 μ . Podosomal shield essentially as in ♀, but rather more uneven in outline and with some setal irregularities. Peritremalia (and surrounding setae), as in ♀, but without distinct posterior sclerotization. Middorsum with three indistinctly outlined shields, each with three or four setae; central shield largest and areolate anterolaterally. Pygidial shield transverse, irregular and with two setae on posterior margin. Posterior body cuticle with three or four pairs of setae.

Sternogenital area fractured, but with four pairs of setae as in ♀. Some irregular sclerotization around SI at least, and certainly none extending beyond coxae IV. Genital aperture in front of SI. Posterior half of venter as in ♀, but only two or three pairs of setae flanking anal shield.

Legs and gnathosoma essentially as in ♀. Cheliceral shaft of uniform diameter. Fixed digit hyaline, rather shorter than movable spermatophore-carrier, which is more strongly sclerotized and apparently tubular. Chelate portion occupying about one third of total length.

***Ptilonyssus sphecotheris* n. sp.**

Figs. 15, 16, 23.

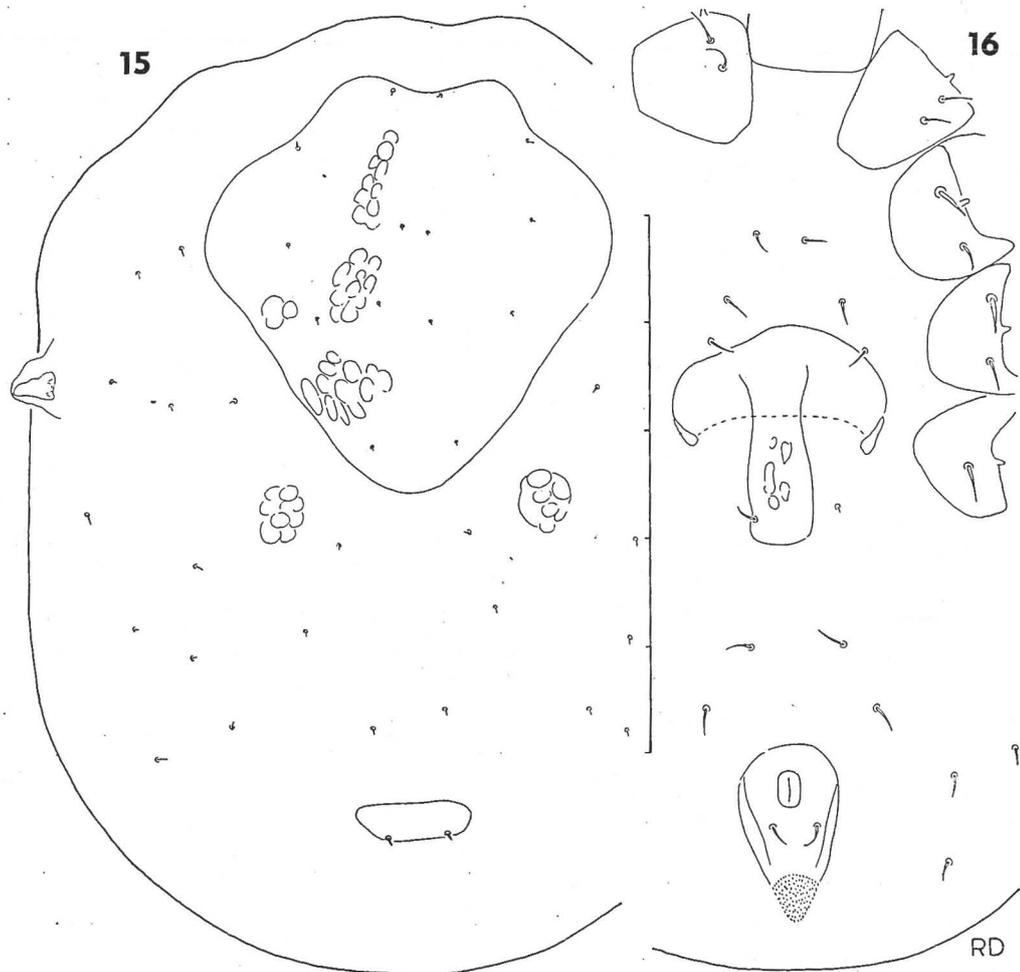
Diagnosis. — Three slender-bodied species of *Ptilonyssus* possess the following characters in common with the stoutly built *P. sphecotheris* — genital shield narrow, postanal seta absent. These are *P. cerchneis* Fain, *P. psophodae* Domrow and *P. macclurei* Fain, but their podosomal shields are rectangular and areolate posterolaterally, whereas in *P. sphecotheris* this shield is cordate. There are also obvious setational differences between the species.

P. trouessarti (Hirst) was also described from *S. vieilloti*, but is amply distinct in having the postanal seta present and the coxal and trochantal setae inflated (see FAIN and HYLAND, 1962).

Types. — Holotype female and eight paratype females from the southern fig-bird, *Sphecotheres vieilloti* Vigors and Horsfield = *S. maxillaris* Gray (Oriolidae), Brisbane, Queensland, viii.1963. Holotype NIC; paratypes BMNH, USNM, AF, RWS and RD.

Female. — Idiosoma much more rounded than in other species, 803-924 μ long. Podosomal shield well defined, granulate and marked by distinct muscle insertions. Maximum width equal to length in midline; anterior half broader, with three concavities medially and anterolaterally; posterior half evenly triangular, with rounded apex. Fourteen small setae and two pores are present on shield, arranged

as figured. Middorsum with two areolate shieldlets. Pygidial shield transverse, with two spinose pygidial setae on posterior margin. Dorsal body cuticle with about five pairs of small setae between peritremalia and podosomal shield, and about nine similar pairs middorsally. Many pores are present in cuticle. Peri-

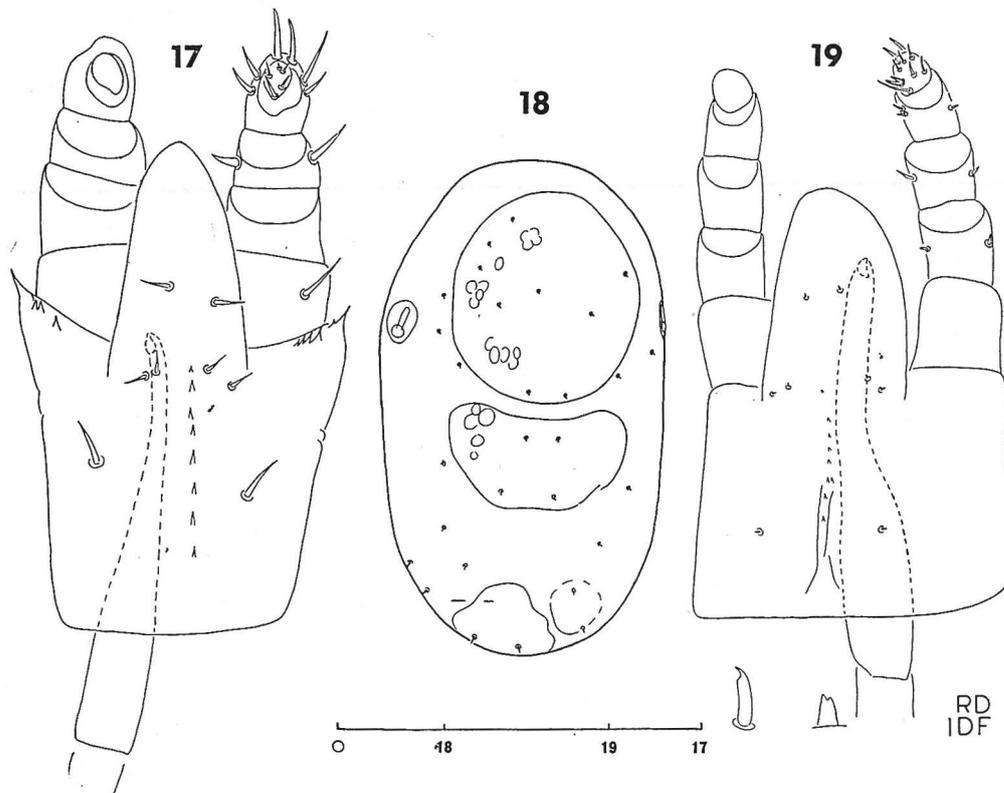


FIGS. 15-16. — *Ptilonyssus sphecotheris* n. sp.
Female. — 15, dorsum; 16, venter.

tremes present, apparently set in small body processes, but this effect may be due to heating during mounting procedure.

Sternal shield not obvious. Six slender sternal setae, but no pores, present. Metasternal setae absent. Genital shield fairly narrow, with margins hyaline, but disc both granulate and areolate; weakly rayed operculum present. Genital setae long and slender, normally set off genital shield. (These setae are atypical

in the specimen figured, and in a second specimen there are two pairs of genital setae, an anterior pair off the shield, and a posterior submarginal pair.) Anal shield somewhat pear-shaped, rounded anteriorly, more strongly sclerotized laterally and with distinct cribrum. Anus set in anterior half, preceding slender adanal setae. Postanal seta absent. Ventral cuticle with two slender setae well in front of, and four or five pairs flanking, anus.



FIGS. 17-18. — *Ptilonyssus philemoni* n. sp. — 17, female gnathosoma; 18, male dorsum.

FIG. 19. — *Ptilonyssus colluricinclae* n. sp.

Female gnathosoma (with inset showing spur on tarsus IV).

Coxal formula 2.2.2.1, setae generally slender, but anterior seta on II and III slightly stronger. Coxa II without process on anterodorsal margin. Setae on trochanters similar to coxal setae. Ventrally, the remaining setae on leg I are peg-like, and on II-IV spinose, but bluntly tipped. Dorsal setae much smaller, those on genu III normal. Tarsus I with dorsodistal sensory zone; tarsi II-III each with three strong ventrodorsal spurs.

Gnathobase with two slender gnathosomal setae and about six small denticles in single file. Hypostomal setae subequal to gnathosomal pair, except for minute outer posterior pair. Palpal trochanter with slender seta ventrally. Remainder

of palpal setation undistinguished except for peg-like seta on inner face of genu. Tibia with two rods distally; tarsus obscured dorsally by tibia, with several setae of variable length, but apparently without bifid claw. Chelicerae bulbous basally, with chelate portion occupying one-twentyfifth of total length.

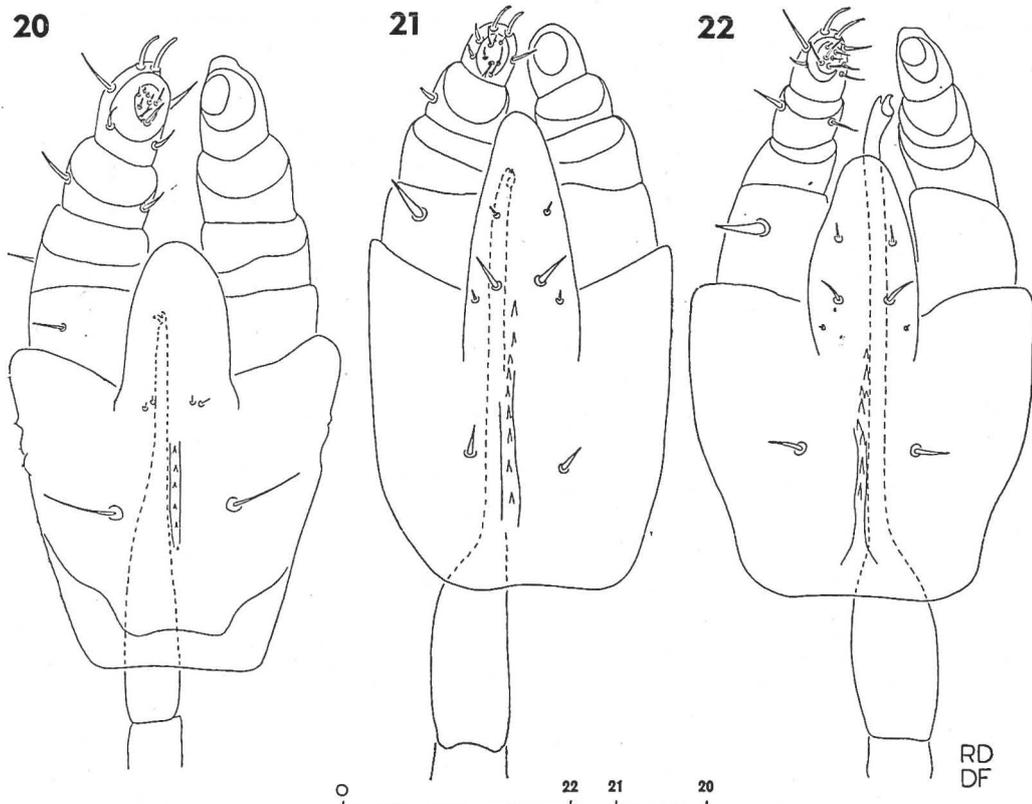


FIG. 20. — *Ptilonyssus myzanthae* n. sp. — Female gnathosoma.
FIG. 21. — *Ptilonyssus macclurei* Fain. — Female gnathosoma.
FIG. 22. — *Ptilonyssus thymanzae* n. sp. — Female gnathosoma.

The immature stages.

I had not intended to treat the limited material before me, but the receipt of Strandmann's fine paper (1960 *a*) prompted me to examine it more closely. I can now fully confirm his findings, based on cheliceral structure, on the alternation of non-feeding and feeding developmental stages as follows — *larva* non-feeding, *protonymph* feeding, *deutonymph* non-feeding, *female* feeding. (None of my larvae contains a developing protonymph, and I have only two males.)

P. cractici n. sp. — Two deutonymphs show trace of elongate opisthosomal

shield with two long, barbed pygidial setae terminally (see STRANDTMANN'S fig. 1 k); one contains developing female. Pygidial shield of protonymph more delicately formed than in female, with two long barbed setae posteriorly; two of twelve contain developing deutonymph. Three females contained larva which extruded during mounting procedure.

P. philemoni n. sp. — Protonymph containing developing deutonymph damaged, but with two long, barbed pygidial setae. One female contained larva which

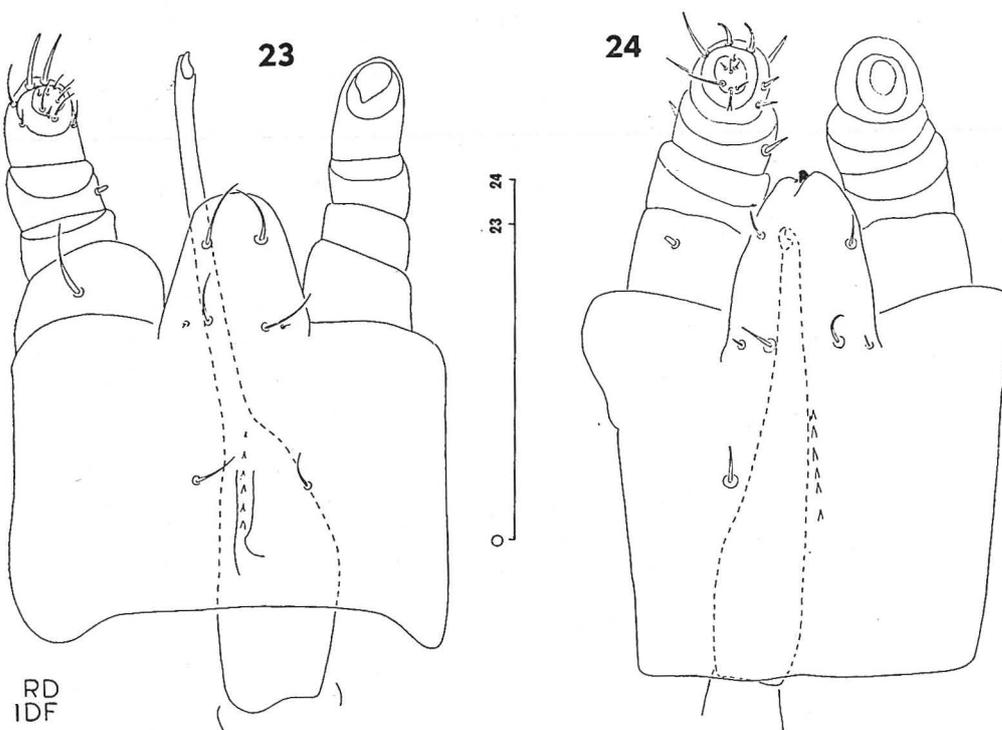


FIG. 23. — *Ptilonyssus sphecotheris* n. sp. — Female gnathosoma.

FIG. 24. — *Ptilonyssus grallinae* n. sp. — Female gnathosoma.

extruded together with egg membrane; four contain ovum with embryonic hexapod larva; fifteen contain undifferentiated ovum.

P. myzanthae n. sp. — Protonymph with idiosoma 528 μ long. Pygidial shield divided, each half with barbed seta almost twice as long as diameter of shieldlet.

P. thymanzae n. sp. — Deutonymph with idiosoma 748-770 μ long. Opisthosomal shield apparently with six short setae arranged 2.2.2 in addition to two long, barbed pygidial setae. One contains developing female.

P. macclurei Fain. — Protonymph with pygidial shield as in adult, but setae more slender and about twice as long.

P. grallinae n. sp. — One deutonymph recalls Strandtmann's fig. 1 k; it contains developing female. Three protonymphs with pygidial shield transverse oval, with two barbed setae slightly longer than shield's shorter diameter.

P. pittae Domrow, 1964. — Deutonymph with pygidial setae inserted in striate

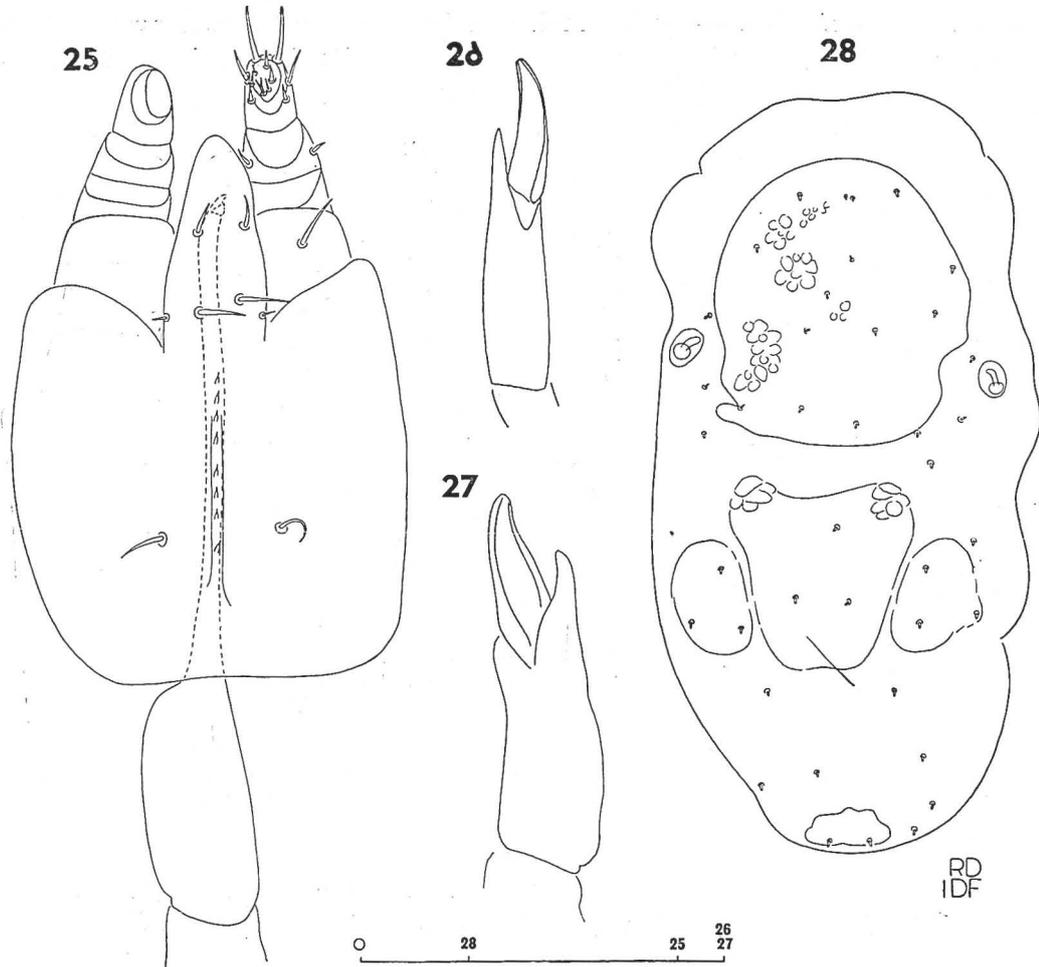


FIG. 25. — *Ptilonyssus cractici* n. sp. — Female gnathosoma.

FIG. 26. — *Ptilonyssus philemoni* n. sp. — Male chelicerae.

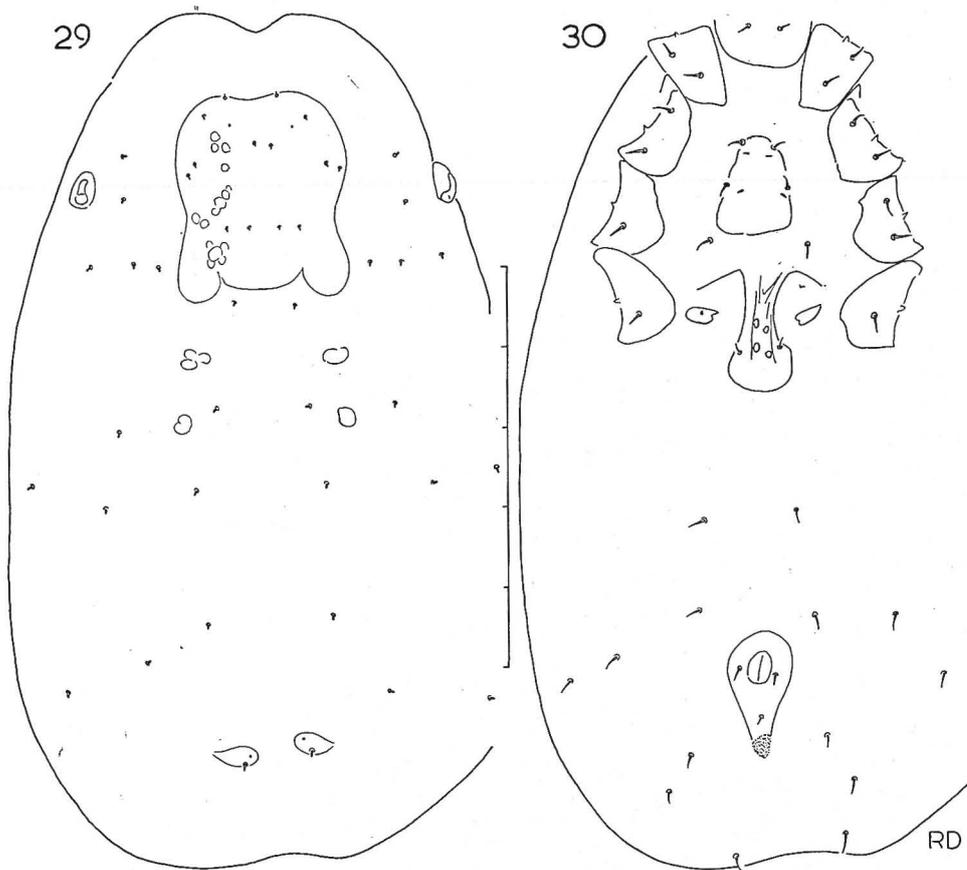
FIGS. 27-28. — *Ptilonyssus grallinae* n. sp.
Male. — 27, chelicera; 28, dorsum.

cuticle, but ill-defined opisthosomal shield present with setae apparently much as in *P. thymanzae* (shield evident more by cessation of cuticular striae than by presence of distinct margin).

P. psophodae Domrow, 1964. — Original specimen described as deutonymph because of well developed chelicerae, but now known to be protonymph. Pygi-

dial area terminal in mounted specimen, and hard to examine, but two long, barbed pygidial setae present. One female contains undifferentiated ovum.

P. ailuroedi Domrow, 1964. — As in *P. psophodae*, specimens described as deutonymphs are really protonymphs. True deutonymphs with four peg-like setae borne on middorsal shieldlet ; some indication of opisthosomal shield, but pygidial



FIGS. 29-30. — *Ptilonyssus motacillae* Fain.
Female. — 29, dorsum ; 30, venter.

setae quite short and undistinguished. Second deutonymph, containing developing adult, apparently with only two peg-like setae middorsally. Pygidial setae also undistinguished in three protonymphs (sixth specimen, considered too damaged for comment in original article, may also be protonymph). One female contained larva in life. All stages of this species seem atypical of the genus *Ptilonyssus* s. s.

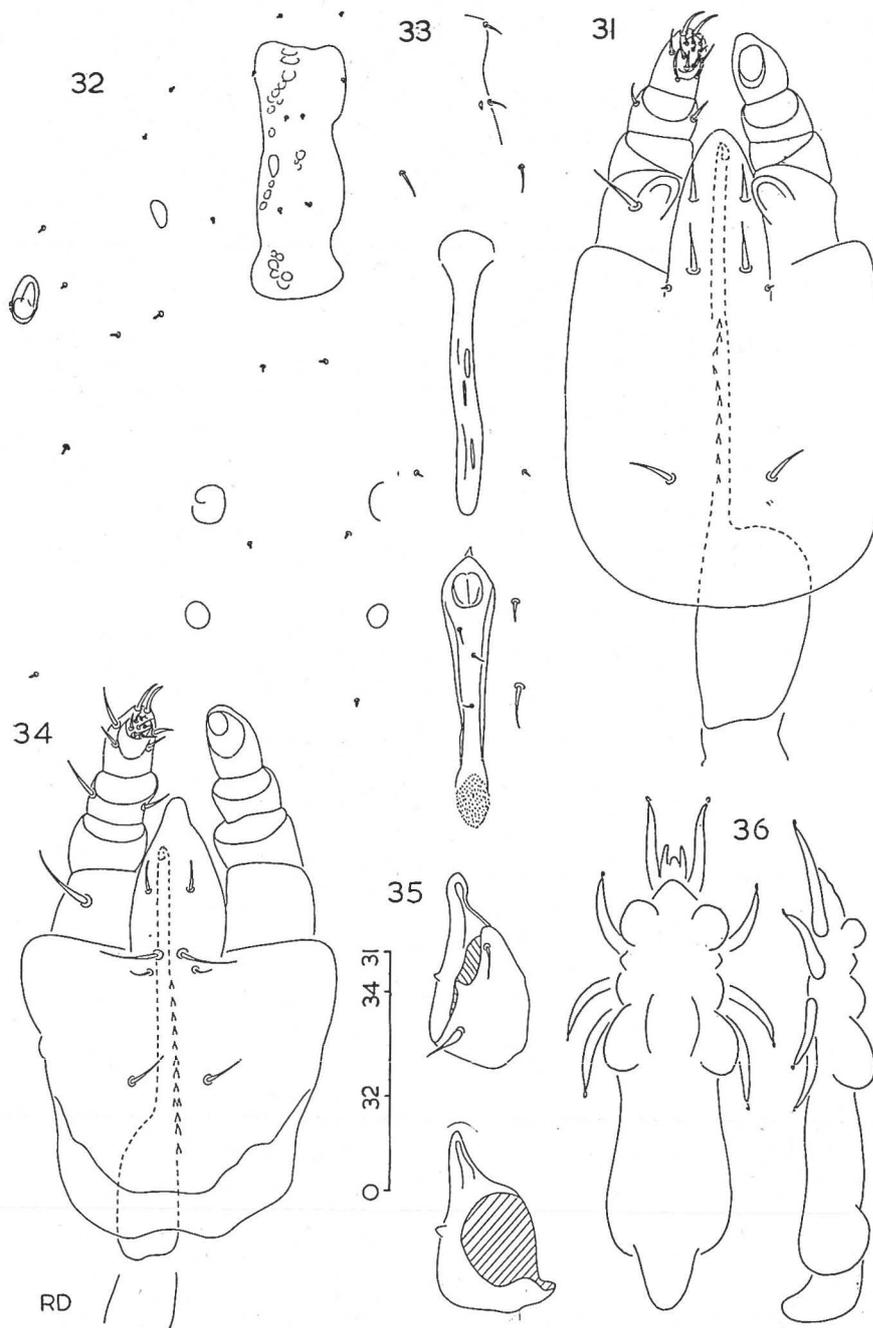


FIG. 31. — *Ptilonyssus motacillae* Fain. — Female gnathosoma.

FIGS. 32-36. — *Ptilonyssus meliphagae*, n. sp.

Female. — 32, podosomal and middorsal shields; 33, sternal, genital and anal shields, with insets to lattermost showing seta between genital and anal shields (above), and flanking anal shield (below); 34, gnathosoma; 35, coxa II (ventral and dorsal views); 36, dorsal and lateral views of whole mite (freehand).

The immature stages of the remaining five Australian species of *Ptilonyssus* are undescribed — *P. colluricinclae* n. sp., *P. meliphagae* n. sp., *P. motacillae* Fain, *P. sphecotheris* n. sp., and *P. trouessarti* (Hirst).

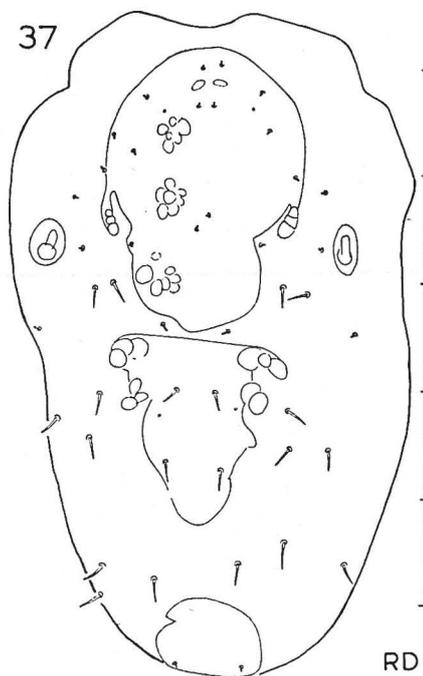


FIG. 37. — *Ptilonyssus thymanzae* n. sp. Male dorsum.

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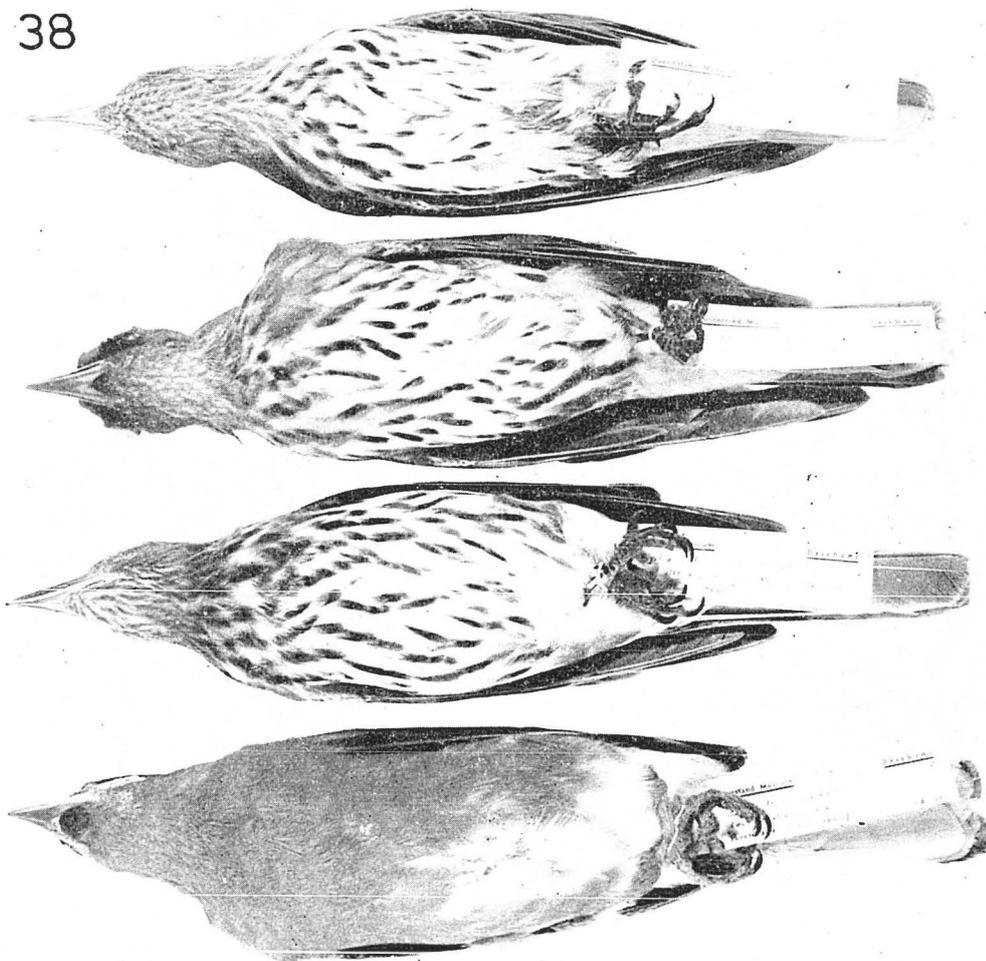


FIG. 38. — Two similar Australian oriolid birds.

From top to bottom, *Oriolus sagittatus* ♀, *O. sagittatus* ♂, *Sphecotheres vieilloti* ♀, and *S. vieilloti* ♂. Please note the similarity of the first three specimens—venter off-white, streaked grey-brown. However, the body and head are green and the tail grey in the former species, while the reverse is true of the latter (the wings are grey-brown in both). The male of *S. vieilloti* is dimorphic—belly green, throat and collar grey, crown black, back green, wings green with black tips and tail black. (Scale $\times 1/2$).

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Addendum.

Three species were inadvertently omitted from the list of nymphs — *P. echinatus*, *P. hirsti*, and *P. ruandae*.
