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Echinozonus, a new genus of feather mites (Pterolichidae) from the Megapodiidae (Aves)

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(With 12 figures)

Abstract

Echinozonus gen. n. (Pterolichoidea, Pterolichidae) is established with **Pterolichus (Pseudalloptes) curtus** Trouessart (type species) and 5 new species: **colothrix, infrequens, kethleyi, leurophyllus,** and **longisetosus.** The mites represent two morphotypes; one species of each morphotype occurs on single species of Megapodiidae.

Keywords: Pterolichidae, feather mites, Megapodiidae parasites, **Echinozonus.**

Trouessart (1884, 1887) described many species of feather mites in the two subgenera of **Pterolichus** Robin, **Pterolichus** and **Pseudalloptes** Trouessart (Pterolichidae, Pterolichinae). Later Trouessart (1916) elevated **Pseudalloptes** to genus level, but this status has rarely been recognized by subsequent researchers (e.g., Dubinin 1956). Gaud (1965) stressed that **Pterolichus** and **Pseudalloptes** were assemblages of heterogenous species occurring on diverse bird orders, and that numerous new feather mite genera should be created. One such species is **Pterolichus (Pseudalloptes) curtus** Trouessart from the Megapodiidae; we will erect a new genus, **Echinozonus**, for this and five new species.

The six feather mite species being considered can be assigned to one of two morphotypes (termed morphotypes 1 and 2 herein). One representative of each morphotype can occur on one host species. It should be noted that when there are multiple infestations by congeners they have been considered as "concomitant species" whereby each species occupies a different microhabitat (Dogel 1949). Furthermore, congeners can be of different morpho- or adaptive types (sensu Dubinin 1956); this might be expected as each congener probably occupies different feather groups, that is, different microhabitats (e.g., Dubinin 1956; Atyeo & Pérez 1988). Most instances of multiple feather mite infestations are discovered from collections derived from avian study skins, thus, as in the current study, the microhabitats of the mites are unknown.

Materials and Methods

Our data base is 54 collections of feather mites from study skins of the Megapodiidae (see Atyeo & Braasch 1966 for collecting technique) and a few slides from the Trouessart collection, Paris; the collections represent 13 of the 19 megapode species recognized by White and Bruce (1986) and include all but 6 species of **Megapodius** Gaimard. There are more than 30 species of pterolichid feather mite taxa in these collections.

In the systematic section, there are detailed illustrations and characterizations of the genus and two morphotypes, therefore, species descriptions per se are limited to morphometrics, and diagnoses are not given as species differences are documented in the keys. Signatures for the idiosomal chaetotaxy follow Griffiths et al. (1990). Measurements are in micrometers, given as the mean $\pm$ standard error (when $N \geq 10$), followed in parentheses, by the observed limits and number of observations. Many specimens examined were distorted because of pressure from the coverslip due to initial preparation technique and/or subsequent shrinkage of the mounting medium. Often the number of observations for a particular measurement is less than the number of study specimens due to missing or broken setae and/or distortion. Abbreviations for type repositories and accession numbers of bird and mite collections are: AMNH, American Museum of Natural History, New York; BMNH, British Museum of Natural History, London; FMNH, Field Museum of Natural History, Chicago; TRT, Trouessart Collection, Paris; UNAM, Universidad Nacional Autónoma de México, Mexico City; UGA, University of Georgia, Athens; and ZMH, Zoologisches Institut und Zoologisches Museum, Hamburg.

Descriptions

Pterolichoidea, Pterolichidae, Pterolichinae
Echinozonus gen. n.

TYPE SPECIES. **Pterolichus (Pseudalloptes) curtus** Trouessart, 1887.

DESCRIPTION. Pterolichine mites with epimerites I free, setae sce long, thin; sci extending beyond posterior margin of prodorsal shield; setae c1 subequal to sci; c2 longer than c3; prodorsal shield incised to setae sci; setae c3 setiform to acuminate blades with or without long, hairlike extensions; hysterosomal shield well developed; opisthonotal glands, cupules ia, im well developed; legs subequal with large, apically dentate pretarsi. Restricted to Megapodiidae.

MALE. Idiosoma with small terminal cleft; setae ps1 of various leaflike configurations; ps2 anteroventral to f2; h2 larger to much larger than h3; e2 large, awl-shaped; summit of genital organ between posterior articulations of trochanters III; genital discs lateral to apex of genital organ; level of setae g posterior to coxal III setae 3a, 3b; ps3 anterior or anterolateral to adanal discs; mesally directed apodemes (paradanal apodemes) anterior to adanal discs with ventrally directed teeth on mesal terminations; adanal discs with weakly sclerotized corollae; tarsus IV with subapical claw.

FEMALE. Idiosoma with rounded terminus; terminal setae h3 approximate; setae h1 lateral to supranal concavity; level of setae e1 either slightly anterior to e2 or nearer to opisthonotal gland openings than e2; hysterosomal shield either entire or interrupted in region of setae e2; epigynum (pregenital sclerite of authors) large, apex between epimerites II, terminations extending posterior to genital discs; legs IV extending beyond terminus by half length of tarsus.

ETYMOLOGY. From echinos (Gr., sea-urchin, spiny) + zone (Gr., belt, girdle) to refer to the ventral teeth on the posterolateral (paradanal) apodemes of males, masculine.

DIAGNOSIS. The species of **Echinozonus** are most similar to **Pterolichus (Pseudalloptes) tridentiger** Trouessart, also from the Megapodiidae. These taxa are easily distinguished by the lengths of the internal scapular setae and setae c1, long in **Echinozonus**, microsetae in **P. tridentiger** and related species. In **Echinozonus** females, the curved apodeme immediately anterior to the oviporus, the epigynum, is independent of epimerites II, and in **P. tridentiger** it is fused with the posterolateral terminations of epimerites I or I and II.

REMARKS. **Pseudalloptes** has been defined in part on character states of males, namely, the diameter of legs IV greater than legs III, a subapical claw on tarsus IV, and the presence of apodemes extending from epimerites IV anteromesally to partially surround the genital organ (Gaud, 1965). However, as Gaud points out, there are so many exceptions to this diagnosis that it is rather meaningless. When undescribed taxa are considered, few of the existing genera are properly defined. As an example, **Echinozonus** gen. n. males have hypertrophied legs IV and tarsal IV claws, but lack apodemes around the genital organ. Additionally, males are weakly bilobed and setae ps1 are leaflike, whereas many described species of the subgenera **Pterolichus** and **Pseudalloptes** have males that are strongly bilobed and setae ps1 are setiform, spiculiform or bladelike.

The posterolateral apodemes of males which curve toward the midline anterior to the adanal discs (termed paradanal apodemes) present many different appearances within the same series of specimens. Laterally each apodeme is thickened and connects with the dorsal and ventral teguments; the thinner mesally directed extensions have a few ventrally directed teeth. In microslide preparations that have had little pressure from the coverslip, the mesal extensions appear to be rather thin and the ventrally directed teeth are difficult to observe (fig. 5). If a specimen has been subjected to excessive pressure during preparation, the mesal portions of the apodemes are twisted from their normal positions and the teeth are easily observed along the mesal margins (figs 1, 7).

The hosts for the **Echinozonus** species are **Aepypodius bruijnii** (Oustalet), **A. arfakianus** (Salvadori), **Alectura lathami** Gray and **Talegalla cuvieri** Lesson. **Aepypodius** species, **A. lathami**, and **T. cuvieri** each have a different pair of associated **Echinozonus** species. Each pair consists of morphotypes 1 and 2, the first is abundant in our collections, the second is rare (compare Type data sections below). Using Dubinin's (1956) criteria for adaptive forms, the rare morphotype would be in protected areas and the abundant one would occur on the exposed ventral surfaces of the wing and/or tail feathers.

The two morphotypes, in essence two sets of sibling species, can be defined by a number of characters, each with two states. Some of these states are reflected in couplets 1 in the keys to males and females.

Morphotype one (**curtus**, **leurophyllus** sp. n., **infrequens** sp. n.) (figs 1-6): Both sexes with setae c1 extending to or beyond level of setae d1; setae c3 curved, attenuated. Male with leaflike setae ps1 relatively large, with obvious veins; basal diameter of setae h2 large, usually three or more times greater than setae h3; membrane surrounding adanal discs asymmetrical; setae ps3 positioned anterior to adanal discs. Female with setae e1, e2 at approximately same level, these setae inserted on or near area of conjunctiva; setae 3a, 3b at approximately same level; terminal setae approximate, e.g., distance ps1:ps1 about 10 µm. Morphotype two (**colothrix** sp. n., **kethleyi** sp. n., **longisetosus** sp. n.) (figs 7-12): Both sexes with setae c1 not extending to level of setae d1; setae c3 piliform or piliform with slightly expanded base. Male with small leaflike setae ps1 with few veins; basal diameter of setae h2 about two times greater than setae h3; membrane surrounding adanal discs symmetrical; setae ps3 positioned anterolateral to adanal discs. Female with setae e1 positioned far anterior to e2; dorsal hysterosomal shield entire; setae 3b positioned more anteriorly to 3a than shown in fig. 3; terminal setae well separated, e.g., distance ps1:ps1 > 10 µm (compare figs 6, 8).

Identification key for **Echinozonus** males (males unknown for **infrequens**)

1. Seta ps1 large, leaflike, with many obvious veins; seta c1 extending to or beyond seta d1; adanal disc membrane asymmetrical (figs 1, 2) 2

   Seta ps1 small, leaflike, with few veins; seta c1 extending at most to 2/3s interspace c1 - d1 (fig. 7); adanal disc membrane symmetrical 3

2. Seta ps1 with notch on mesal surface, 43-47 µm in length; c1 extending posterior to d2; hysterosomal shield with small pits (fig. 2) . . . . . **curtus** (Trouessart)

   Seta ps1 with smooth mesal surface, 33-39 µm in length; c1 extending to d1; hysterosomal shield with large pits (fig. 5) . . . . . **leurophyllus** sp. n.

3. Seta d2 small, setiform, not extending to level of opisthonotal gland opening (fig. 9) 4

   Seta d2 large, parallel-sided, extending posterior to opisthonotal gland opening (fig. 11) . . . . . **longisetosus** sp. n.

4. Distance between external scapular setae greater than 100 µm; seta c1 about 55 µm (fig. 9) . . . . . **kethleyi** sp. n.

   Distance between external scapular setae less than 90 µm; seta c1 about 37 µm (fig. 7) . . . . . **colothrix** sp. n.

Identification key for **Echinozonus** females

1. Seta c1 extending to or beyond d1; setae e1, e2 inserted at approximately same level; hysterosomal shield interrupted in area of e setae (fig. 4); setae 4a closer to midline than setae 3a (fig. 3) 2

Seta c1 extending at most 3/4s interspace c1 - d1; seta e1 inserted far anterior to e2; hysterosomal shield entire (fig. 8); setae 3a closer to midline than 4a 4

2. Hysterosomal shield with small pits 3

Hysterosomal shield with large pits (fig. 6) . . . . . **leurophyllus** sp. n.

3. Seta sci > 80 µm; seta c1 > 100 µm (figs 3, 4) . . . **curtus** (Trouessart)

Seta sci < 70 µm; seta c1 < 90 µm . . . . . **infrequens** sp. n.

4. Seta c1 extending 1/2 c1 - d1 interspace; seta d2 piliform (fig. 8) 5

Seta c1 extending 3/4 c1 - d1 interspace; seta d2 large, parallel-sided (fig. 12) . . . . . **longisetosus** sp. n.

5. Total length, including gnathosoma, less than 500 µm; idiosoma ovoid (fig. 8) . . . . . **colothrix** sp. n.

Total length, including gnathosoma, greater than 550 µm; idiosoma rectangular (fig. 10) . . . . . **kethleyi** sp. n.

Echinozonus curtus (Trouessart) comb. n.
(Figs 1-4)

Pterolichus (Pseudalloptes) curtus: Trouessart, 1887: 115-116.
Pterolichus (Pseudalloptes) curtus: Trouessart & Neumann, 1888: 341.
Pterolichus (Pseudalloptes) curtus: Canestrini & Kramer, 1899: 61.
Pseudalloptes curtus: Radford, 1953: 203.
Pterolichus (Pseudalloptes) curtus: Dubinin, 1956: 52, 89, 92.
Pseudalloptes curtus: Radford, 1958: 121.

TYPE DATA. From **Psittrichus fulgidus** (Lesson) (= **Dasyptilus pecqueti**) (Psittacidae, error, see Remarks): New Guinea: holotype male, [before 1884], no other data (TRT slide 31 D 16). Holotype deposited in TRT.

MATERIAL EXAMINED. Holotype, and from **Aepypodius bruijnii:** Indonesia: Waigeu Island, 16 males, 6 females, 1894, A. A. Bruijn (AMNH 539411, UGA 5339; AMNH 539410, UGA 5340); New Guinea: 1 male, 2 females, no other data (TRT slide 37 D 3 + 1 unnumbered slide). From **Aepypodius arfakianus:** Indonesia: West Irian: Idenburg River, 6 km SW Bernhard Camp (39°15'E, 3°30'S), 4 males, 8 females, 21 February 1939, R. Archbold (AMNH 338429, UGA 5336); Snow Mountains, 5 males, 2 females, 24 September 1910, A. S. Meek (AMNH 539393, UGA 5337); Cyclops Mountains, 2 females, 3 September 1928, E. Mayr (AMNH 239440, UGA 5338).

Redescription

MALE (Morphotype 1). Length, including gnathosoma 416±3 (386-440, 22), width 238±2 (208-254, 25), gnathosomal length 74.9±0.3 (72.5-78.4, 20), gnathosomal width 80.0±1.2 (74.5-94.1, 21), sce:sce 115.9±0.6 (110.8-123.5, 26), sci:sci 79.1±0.5 (74.5-82.3, 24), sci length 74.5±1.7 (62.7-80.4, 11), c1 length 100.0 (98.0-101.9, 3), c2 length 60.5±2.0 (54.1-76.4, 18), e2 length 73.3±0.9 (68.6-78.4, 16), ps1 length 45.4±0.5 (41 2-49 0, 17).

FEMALE (Morphotype 1). Length, including gnathosoma 495±6 (455-532, 15), width 261±3 (239-278, 17), gnathosomal length 84.5±1.4 (75.4-94.1, 12), gnathosomal width 94.1±2.2 (80.4-103.9, 13), sce:sce 122.9±0.6 (119.6-129.4, 18), sci:sci 83.9±0.9 (80.4-91.1, 17), sci length 79.1 (70.6-88.2, 8), c1 length 104.9 (101.9-107.8, 2), c2 length 58.8±2.6 (49.0-70.6, 10), e2 length 40.5±1.2 (33.3-47.0, 15).

REMARKS. Collecting from museum study skins can create erroneous host-parasite associations, as exemplified by feather mite species reported from the parrot **Psittrichas fulgidus** (= **Dasyptilus pecqueti**), New Guinea. From this host, Trouessart (1887) described two new species, **Anorthalloptes megamerus** [= **Proctophyllodes (Alloptes) megamerus**] and **Echinozonus curtus** (Trouessart) [= **Pterolichus (Pseudalloptes) curtus**], both on Trouessart slide 31 D 16. Each taxon was based on a single male, and each taxon has subsequently been found to be associated with other hosts. Atyeo and Gaud (1976) found that **A. megamerus** is a commensal of a New Guinean parrot; Trouessart and Neumann (1888) stated that **P. curtus** was found on [museums study skins] of **Megapodius freycinet** and **Aepypodius bruijnii**. The Trouessart and Neumann specimens from **M. freycinet** are not in the Trouessart Collection in Paris, and in our 11 collections from **M. freycinet** we have never found specimens of **Echinozonus** species, therefore, the **Echinozonus curtus** - **Megapodius freycinet** record may be an error.

Echinozonus leurophyllus sp. n.
(Figs 5, 6)

TYPE DATA. From **Alectura lathami purpureicollis** (Le Souëf): Australia: Queensland: Cape York, (? Utinge), holotype male, 9 male, 13 female paratypes, 27 July 1912, R. Kemp (AMNH 539302, UGA 5323). From **Alectura l. lathami**: SE Queensland: Brookfield, 1 male, 4 female paratypes, December 1975, A. H. Waddell (UGA 8656). Holotype deposited: AMNH; paratypes: AMNH, BMNH, UNAM, UGA, ZMH.

ETYMOLOGY. From leuros (Gr., smooth, level) + phyllon (Gr., leaf) to call attention to the apex of male seta ps1.

DESCRIPTION. Male (Morphotype 1): Length, including gnathosoma 395±3 (374-416, 19), width 231±2 (216-247, 20), gnathosomal length 74.6±0.7 (68.6-78.4, 14), gnathosomal width 75.2±0.6 (72.5-80.4, 14), sce:sce 114.0±0.6 (110.8-121.5, 20), sci:sci 78.0±0.6 (74.5-84.3, 20), sci 59.0±1.3 (49.0-68.6, 13), c1 75.6 (62.7-82.3, 7), c2 52.2±1.0 (45.1-58.8, 17), e2 65.3±1.1 (56.8-72.5, 16), ps1 37.0±0.4 (33.3-41.2, 20).

FEMALE (Morphotype 1). Length, including gnathosoma 466±5 (440-501, 20), width 257±3 (239-285, 20), gnathosomal length 84.8±0.8 (80.4-88.2, 12), gnathosomal width 75.2±0.6 (72.5-80.4), sce:sce 121.6±0.7 (115.6-127.4, 18), sci:sci 84.2±0.7 (78.4-88.2, 20), sci 60.8±1.6 (52.9-68.6, 12), c1 84.9±1.5 (78.4-92.1, 10), c2 50.0±1.5 (39.2-60.8, 19), e2 33.8±1.1 (29.4-39.2, 14).

Echinozonus infrequens sp. n.

TYPE DATA. From **Talegalla cuvieri:** New Guinea, no other data, holotype female, 1 male (incomplete), 3 female paratypes (TRT 37 A 2). Holotype and paratypes in TRT.

ETYMOLOGY. The specific epithet refers to an infrequently collected species.

DESCRIPTION. Male (Morphotype 1, n=1, incomplete specimen): Length, including gnathosoma 355, width 204, gnathosomal length 66.6, gnathosomal width 72.5, sce:sce 105.8, sci:sci unmeasurable, sci missing, c1 missing, c2 41.2, d2 missing, e2 64.7, ps1 49.

FEMALE (Morphotype 1). Length, including gnathosoma 470 (455-486, 4), width 263 (251-270, 4), gnathosomal length 81.8 (80.4-84.3, 4), gnathosomal width 94.6 (92.1-98.0, 4), sce:sce 126.9 (119.6-131.2, 4), sci:sci 83.8 (82.3-88.2, 4), sci 66.2 (62.7-68.6, 4), c1 88.2 (N=1), c2 47.5 (41.2-50.9, 4), d2 47.0 (N=1), e2 40.2 (37.2-45.1, 4).

REMARKS. Trouessart slides often have many specimens of various taxa. On the type slide for this species (TRT 37 A 2), in addition to the type series of **Echinozonus infrequens** sp. n., there are 9 males and 3 females of **Echinozonus colothrix** sp. n., 5 males and 11 females of **Pterolichus (Pseudalloptes) tridentiger**, and 1 female of **Pterolichus (Pseudalloptes) palmiger** Trouessart. The holotype female of the new species being described is the specimen having setae c1.

Echinozonus colothrix sp. n.
(Figs 7, 8)

TYPE DATA. From **Talegalla cuvieri:** New Guinea: no other data, holotype male, 9 male, 5 female paratypes (TRT 37 A 2 and 2 unnumbered slides, see Remarks). Holotype and paratypes deposited in TRT.

ETYMOLOGY. From kolos (Gr., shorten) and thrix (Gr., hair) to call attention to the comparatively short setae sci and c1.

DESCRIPTION. Male (Morphotype 2): Length, including gnathosoma 396+3 (386-416, 10), width 232 (224-239, 9), gnathosomal length 71.1+0.3 (70.6-72.5, 10), gnathosomal width 78.2 (74.5-82.3, 9), sce:sce 107.8 (103.9-111.7, 8), sci:sci 61.7 (58.8-70.6, 8), sci 41.7 (39.2-45.1, 9), c1 38.7 (37.2-39.2, 4), c2 43.4 (39.2-47.0, 7), d2 37.2 (33.3-45.1, 7), e2 71.3 (62.7-78.4, 8), ps1 22.3 (19.6-27.4, 8).

FEMALE (Morphotype 2). Length, including gnathosoma 489 (478-501, 5), width 264 (247-285, 5), gnathosomal length 85.5 (82.3-88.2, 5), gnathosomal width 96.4 (94.1-100.0, 5), sce:sce 124.3 (121.5-127.4, 5), sci:sci 67.6 (65.7-70.6, 5), sci 47.4 (43.1-52.9, 4), c1 47.4 (46.1-49.0, 3), c2 45.1 (43.1-49.0, 5), e2 36.1 (31.4-41.2, 5).

REMARKS. Trouessart prepared microslides from material taken from museum study skins and excess material was stored in envelopes. During his studies of the Trouessart collection, J. Gaud made preparations from specimens taken from Trouessart's envelopes to obtain examples of named species (Gaud, pers. comm.). The holotype and 2 female paratypes from the unnumbered Trouessart slides are from this source, one microslide with the holotype, the other with two female paratypes.

Echinozonus kethleyi sp. n.
(Figs 9, 10)

TYPE DATA. From **Aepypodius bruijnii**: Indonesia: Waigeu Island, holotype male, 2 male, 1 female paratypes, circa 1894, A. A. Bruijn (AMNH 539410, UGA 5340); [Waigeu Island], 2 male, 3 female paratypes, no other data (TRT 37 B 16, 37 C 1 + 2 unnumbered slides). From **Aepypodius arfakianus**: Indonesia: West Irian: Idenburg River, 6 km SW Bernhard Camp (39°15'E, 3°30'S), 3 male paratypes, 21 February 1939, R. Archbold (AMNH 338429, UGA 5336); Cyclops Mts., 1 male paratype, 3 September 1928, E. Mayr (AMNH 293440, UGA 5338). Holotype deposited: AMNH; paratypes deposited: AMNH, TRT, UGA, ZMH.

ETYMOLOGY. This species is named for Dr. John B. Kethley, Field Museum of Natural History, with whom we have had many fruitful discussions about acarine systematics.

DESCRIPTION. Male (Morphotype 2): Length, including gnathosoma 455 (440-478, 5), width 267 (254-278, 5), gnathosomal length 76.8 (70.6-82.3, 5), gnathosomal width 83.3 (82.3-84.3, 2), sce:sce 117.2 (109.8-121.5, 5), sci:sci 61.9 (56.8-66.6, 5), sci 52.3 (41.2-58.8, 4), c1 59.8 (54.9-64.7, 2), c2 56.4 (47.0-62.7, 5), e2 77.7 (74.5-82.3, 3), ps1 23.5 (21.6-25.4, 3).

FEMALE (Morphotype 2): Length, including gnathosoma 555 (524-578, 3), width 280 (278-285, 3), gnathosomal length 86.2 (84.3-88.2, 3), gnathosomal width 103.9 (N=2), sce:sce 129.4 (125.4-131.3, 3), sci:sci 70.6 (68.6-72.5, 3), sci 55.9 (49.0-62.7, 2), c1 59.8 (50.9-68.6, 2), c2 51.0 (43.1-58.8, 3), e2 35.9 (33.3-37.2, 3).

Echinozonus longisetosus sp. n.
(Figs 11, 12)

TYPE DATA. From **Alectura l. lathami:** Australia: Queensland: (?Barron River), holotype male, 1 female paratype, 19 July 1884, G. M. Mathews (AMNH 539322, UGA 5324). From **Alectura lathami purpureicollis:** Australia: Queensland: Cape York: (?Utinge), 2 male, 2 female paratypes, 27 July 1912, R. Kemp (AMNH 539302, UGA 5323). Holotype deposited: AMNH; paratypes deposited: AMNH, UGA.

ETYMOLOGY. From longus (L., long) + seta (L., bristle) to call attention to the long setae d2 of both sexes and e2 of males.

DESCRIPTION. Male (Morphotype 2): Length, including gnathosoma 561 (540-578, 5), width 320 (297-339, 5), gnathosomal length 93.7 (88.2-98.0, 5), gnathosomal width 95.1 (92.1-98.0, 4), sce:sce 141.9 (125.4-150.9, 5), sci:sci 79.2 (72.5-82.3, 5), sci 68 6 (66.6-70.6, 3), c1 70.6 (68.6-72.5, 2), c2 93.6 (82.3-107.8, 4), e2 104.4 (94.1-109.8, 4), ps1 29.4 (27.4-31.4, 5).

FEMALE (Morphotype # 2): Length, including gnathosoma 558 (540-578, 3), width 326 (316-339, 3), gnathosomal length 101.9 (N=2), gnathosomal width 94.1 (N=1), sce:sce 146.4 (135.2-158.8, 3), sci:sci 83 (74.5-88.2, 3), sci 75.5 (66.6-84.3, 2), c1 80.4 (72.5-88.2, 2), c2 97.3 (88.2-103.9, 3), e2 52.9 (45.1-56.8, 3).

Summary

The species of **Echinozonus** gen. n. have a different type of association as each pair is found on the same host species. Each morphotype has speciated repeatedly, but it is curious that each pair has maintained host integrity.

Host taxa	Morphotype 1	Morphotype 2
Aepypodius 2 spp.	**curtus**	**kethleyi**
Alectura lathami	**leurophyllus**	**longisetosus**
Talegalla cuvieri	**infrequens**	**colothrix**

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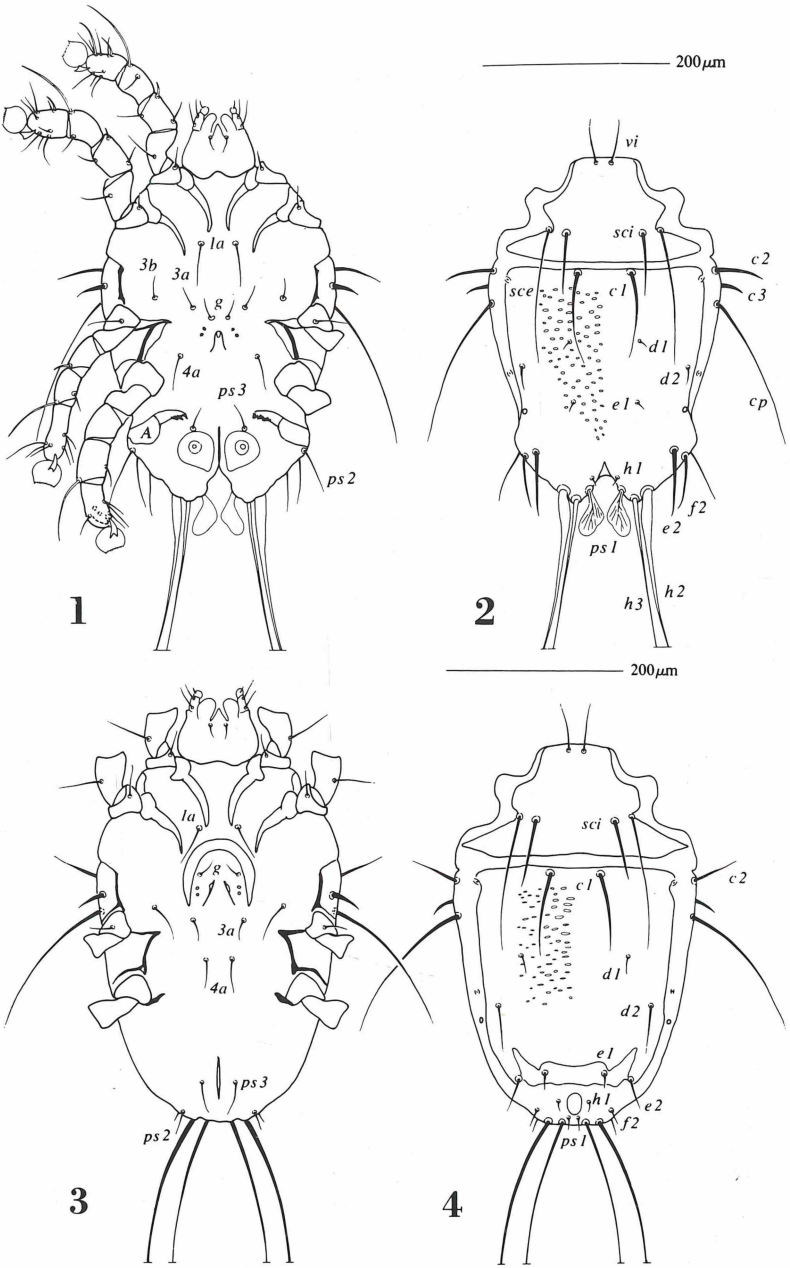
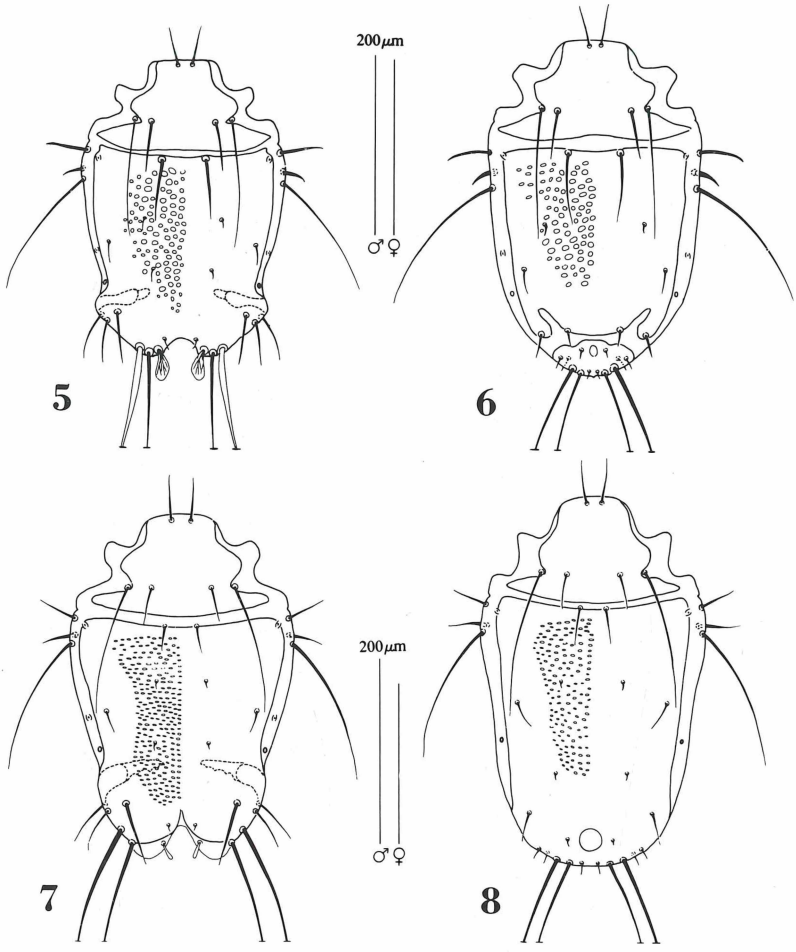
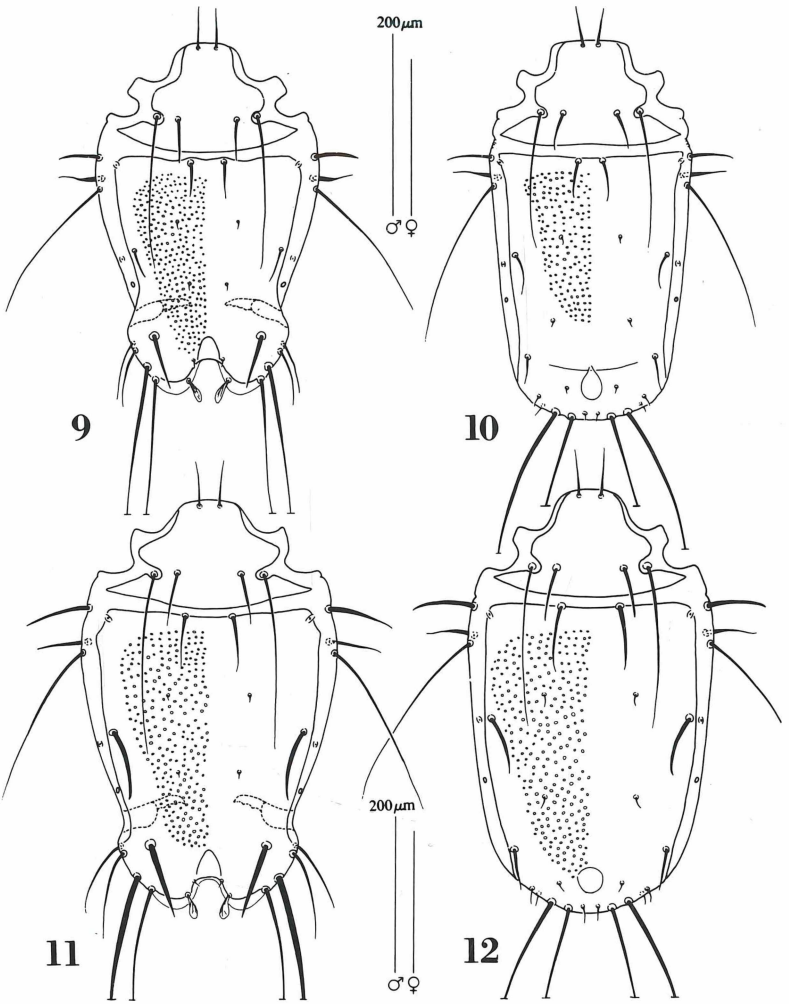


Figs 1-4: **Echinozonus curtus** (Trouessart): 1, 2, male, ventral and dorsal aspects; 3, 4, female, ventral and dorsal aspects. A = paradanal apodeme; setal signatures follow Griffiths et al. (1990).



Figs 5-8: Dorsal idiosomata of males (left) and females (right): 5, 6, **Echinozonus leurophyllus** sp. n.; **Echinozonus colothrix** sp. n.



Figs 9-12: Dorsal idiosomata of males (left) and females (right): 9, 10, **Echinozonus kethleyi** sp. n.; 11, 12, **Echinozonus longisetosus** sp. n.

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