

On systematics of the feather mite genus *Triphyllochaeta* Dubinin, 1956 (Astigmata: Pterolichidae)

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(With 5 figures)

Abstract

A new species of the feather mite genus *Triphyllochaeta* Dubinin, 1956 (Astigmata, Pterolichidae), *T. paravanelli* sp. n. from the Andean Lapwing (*Vanellus resplendens*) is described. All known species of the genus are studied and illustrated. New host-mite relationships are found. A key to all known species of *Triphyllochaeta* is provided.

Introduction

The feather mite genus *Triphyllochaeta* Dubinin, 1956 (Pterolichidae: Magimeliinae) encompasses a small number of species restricted to the shore birds of the family Charadriidae (Charadriiformes). This taxon was originally established by Dubinin (1956) as a subgenus within the genus *Montchadskiana* Dubinin, 1951 and included two species: *Triphyllochaeta vanelli* (Canestrini, 1878) from the Northern Lapwing *Vanellus vanellus* (L.), and *T. charadrii* (Dubinin, 1951) from some plovers of the genus *Charadrius* (L.). Gaud and Mouchet (1959) described the third species, *T. hyperschiza*, distributed on various African lapwings (*Vanellus* Brisson, 1760). Finally, Gaud (1972) removed *Triphyllochaeta* from *Montchadskiana* and elevated it to the generic rank.

In the course of our study of feather mites of the family Pterolichidae associated with shore birds, a number of new species have been found, and new host associations of these mites have been recovered (Dabert 1997b; Dabert and Ehrnsberger 1999). The present paper continues the taxonomic studies on the subfamily Magimeliinae and includes an improved diagnosis of the genus *Triphyllochaeta*, the description of one new species, a key to all recently recovered species of the genus as well as new data on their host-parasite associations.

Material and methods

The material used in the present study was obtained on loan from various museums and collected by authors from museum skins of birds or in field. The mites were mounted in polyvinyl lactophenol medium and investigated under light microscopes Olympus BX50 with Nomarsky contrast phase. In species descriptions, all measurements are given in micrometers. The chaetotaxy nomenclature follows Gaud & Atyeo (1996). Scientific names of birds are those of Sibley & Monroe (1990).

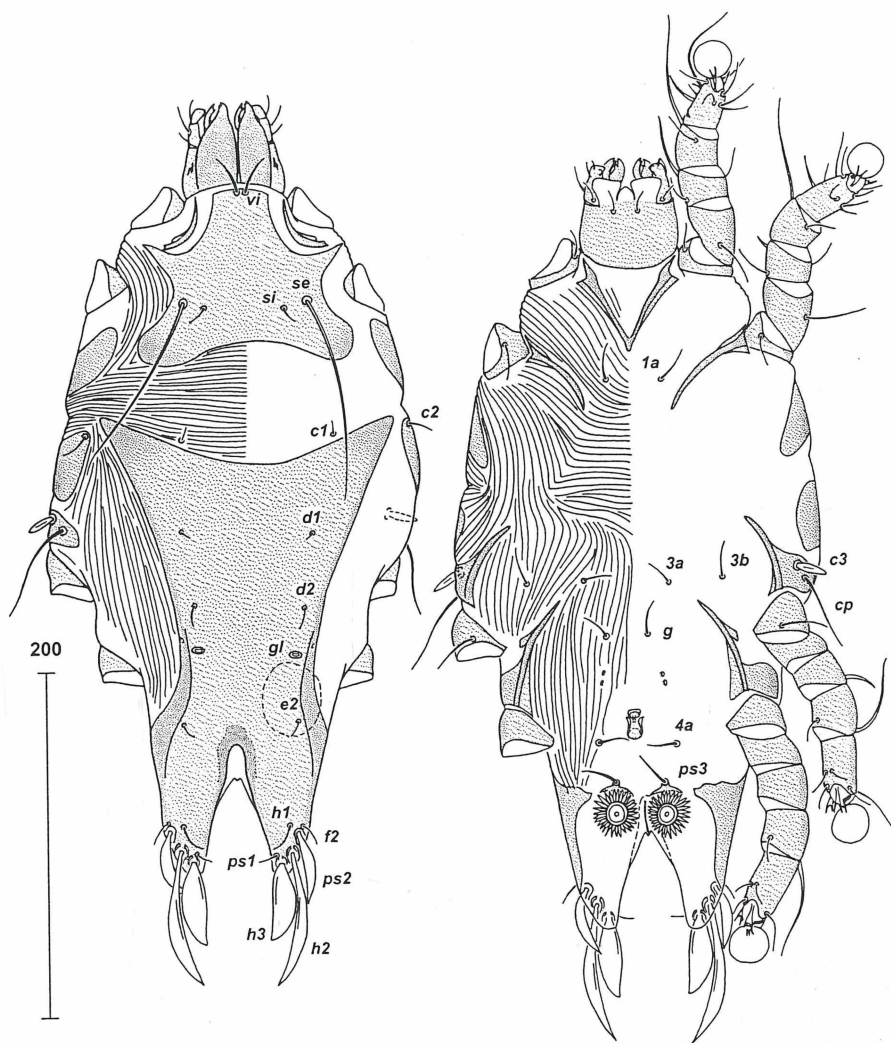


Fig. 1. *Triphyllochaeta paravanelli* sp. n., male dorsal (left) and ventral (right) view. Designations of setae follows Gaud & Atyeo (1996).

Abbreviations used: AMNH - American Museum of Natural History, USA; BMOC - collection of Dr. BARRY M. OCONNOR; NU - University of Nebraska, USA; UAM - Department of Animal Morphology, Adam Mickiewicz University, Poznań, Poland; UGA - University of Georgia, Athens, USA; UMMZ - University of Michigan, Zoological Museum, Ann Arbor, USA; USNM - US National Museum of Natural History; ZISP - Zoological Institute, Saint-Petersburg, Russia; ZMH – Zoological Museum Hamburg (ZMH Acc. Nos: A 14/02 and A 15/02).

Systematics

Pterolichidae Trouessart & Megnin, 1884
Magimeliinae Gaud, 1972

Triphyllochaeta Dubinin, 1956

Triphyllochaeta Dubinin, 1956: 506 (subgen.); Gaud 1972: 79.

Type species: *Dermaleichus vanelli* Canestrini, 1878, by original designation.

DIAGNOSIS. Both sexes: Idiosoma moderately elongated, with well developed dorsal shields, hysterosoma slightly attenuate to posterior end. Hysteronotal shield with concave anterior margin; surface dotted or with transversal striation. Setae *vi* present. Dorsal hysteronotal setae of medial row short; setae *e1* absent. Setae *c3* lanceolate, short. Epimeres I fused V- or Y-likely. Sclerotization of coxal fields I-IV poorly developed. Solenidion *sigma* 2 on genu I absent.

Male s. Opisthosomal lobes well developed, elongated, attenuate to posterior, with rounded apices. Supranal concavity closed or not expressed. Setae *h3* leaf-like or lanceolate, setae *h2* and *ps2* saber-shaped. Genital apparatus situated at level of trochanters IV. Genital sheath as short curved tube; aedeagus short. Paragenital apodemes absent. Genital acetabulae at level of genital apparatus or slightly anterior. Opisthoventral shields well developed, triangular. Adanal shields as small transversal sclerites between medial angles of opisthoventral shield. Setae *ps3* situated on adanal shields, setiform. Adanal discs large, circular, with radially striated corollae.

Legs III, IV similar in size. Tarsus IV slightly longer than tarsus III, without apical apophysis. Setae *e*, *d* of tarsus IV reduced up to little pits.

Female s. Opisthosoma rounded. Posterior part of hysteronotal shield dotted or with transversal desclerotized band at level of posterior quarter. Supranal concavity well developed, circular. Setae *h1* setiform or needle-like, short. Lateral setae *e2* significantly shorter than half of idiosoma width. Setae *f2* short, hair-like. Setae *h2* and *h3* as macrochaetae. Epigynum absent. External copulatory tube cone-like, very short.

The genus includes 4 species restricted to the plovers and lapwings of the subfamilies Charadriinae and Vanellinae (Charadriidae).

1. *Triphyllochaeta vanelli* (Canestrini, 1878) (Figs 3B, 5)

This species is only known from the Northern Lapwing (*V. vanellus*) and recorded from many locations throughout all ranges of this host in Europe, Asia and Northern

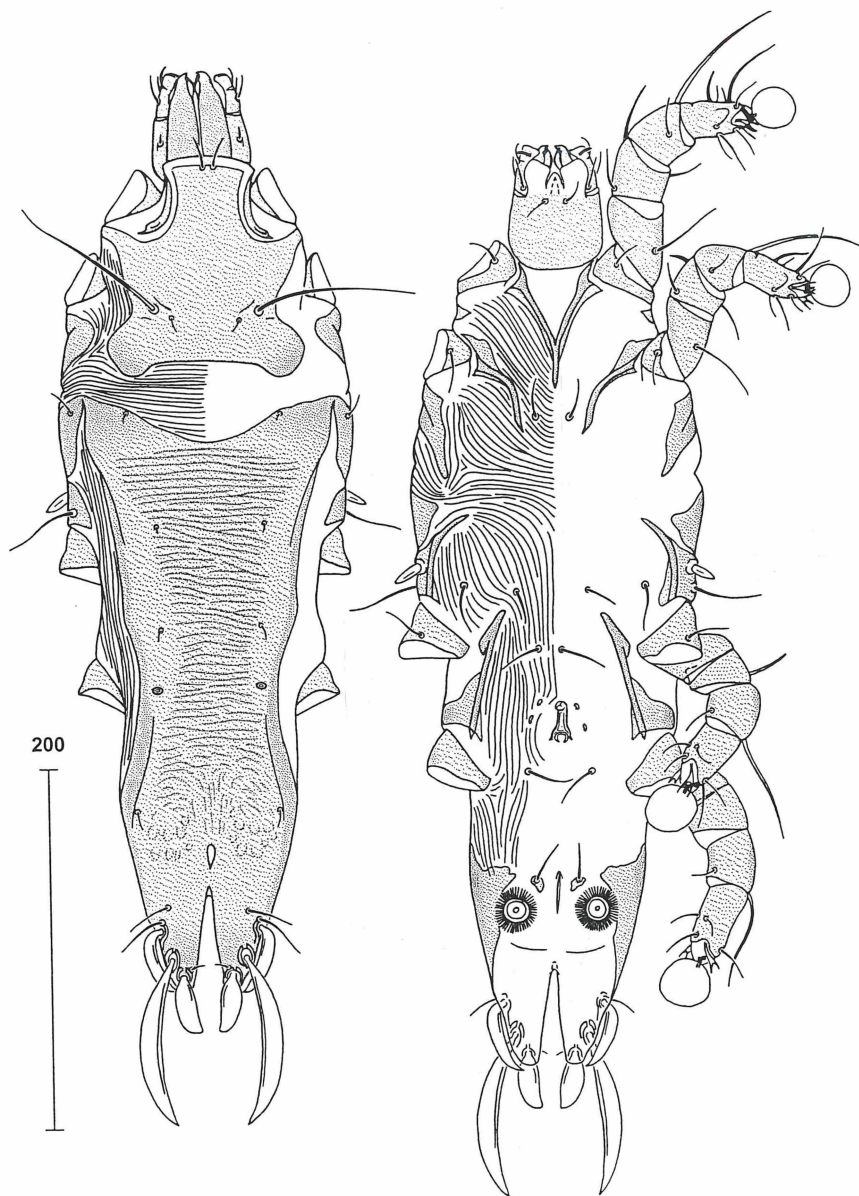


Fig. 2. *Triphyllochaeta charadrii* Dubinin, male dorsal (left) and ventral (right) view.

Africa (Canestrini 1878; see Dubinin 1956 for major old references; Černý 1971, Gaud & Till 1961; Gaud & Mouchet 1959; Mironov 1981; Dabert 1997a).

Material examined. 3♂, 1♀ from *Vanellus vanellus*, Slonsk Nature Reserve, Poland, 27 July 1988, leg. M. Giertych, UAM 01146; 2♂, 4♀ - Slonsk Nature Reserve, Poland, 29 July 1988, leg. G. Lorek, UAM 01155; 2♂, 4♀ - Slonsk Nature Reserve, Poland, 26 July 1988, leg. M. Giertych, UAM 01133.

2. *Triphyllochaeta paravanelli* sp. n. (Figs 1, 3C)

TYPE MATERIAL: Holotype ♂, 6♂ and 9♀ paratypes from the Andean Lapwing *Vanellus resplendens*, South America, 28 Mai 1937, leg. H. E. Hinton, NU 8438. Type specimens are deposited: holotype, paratype UMMZ, other paratypes – ZMH (Acc. No A 14/02), UAM.

ADDITIONAL MATERIAL: ♂ from the Southern Lapwing *Vanellus chilensis*, El Vergel, Angol, Malecco Prov, Chile, 12 January 1936, leg. D. S. Bullock, NU 9572; 2♀ - El Vergel, Angol, Malecco Prov, Chile, 15 January 1961, leg. J. K. Greer, NU 9573.

Male (holotype). Idiosoma length 395, width 210 (idiosomal size of 3 paratypes 382-400 x 185-210). Propodosoma length 128. Prodorsal shield 110 in length, 125 in width, setae *se* separated by 73. Hysteronotal shield without transversal striation, 260 in length, 165 in width at anterior margin. Length of hysteronotal glands 35-45. Opisthosomal lobes gradually attenuate to apices, rounded. Terminal cleft narrow angular, with rounded anterior end, 75 in length (75-85 in paratypes). Distance from anterior end of terminal cleft to the level of setae *e2* 16. Distance between setae and openings: *d2-gl* 25, *gl-e2* 36, *ps2-h3* 16, *h3-h3* 50. Setae *f2*, *h1*, *ps1* hair-like, thin. Length of lanceolate and saber-like setae of opisthosomal lobes: *ps2* 33, *h2* 80, *h3* 44.

Epimeres I fused V-likely. Genital apparatus at level of trochanters IV with small and short tube-like sheath, 12 in length, 8 in width. Genital acetabules slightly anterior to genital apparatus. Adanal shields as little bow-like sclerites. Setae *ps3* thin needle-like, about 30 in length. Setae *3a* and *3b* approximately at the same transversal level. Distance between ventral setae: *3a-3a* 50, *3a-g* 30, *g-4a* 52, *4a-4a* 44, *4a-ps3* 22, *ps3-ps3* 28.

Legs IV extending by ambulacral discs beyond lobar apices.

Female (paratype). Idiosoma length 475, width 213 (idiosomal size in 8 other paratypes 472-485 x 210-230). Propodosoma length 125. Prodorsal shield 115 in length, 152 in width, setae *se* separated by 90. Hysteronotal shield with slightly concave anterior margin, without transversal striation, 345 in length, 190 in width. Posterior quarter of hysteronotal shield with transversal desclerotized band. Setae *h1* hair-like, about 30 in length, situated on desclerotized band. Length of dorsal hysteronotal glands 50-55.

Terminus of opisthosoma with small median incision between setae *h3*, copulatory tube cone-like, about 4 in length. Distance between setae and openings: *d2-gl* 41, *gl-e2* 57, *e2-f2* 62, *h1-h3* 43, *h2-h2*.

Legs IV extending by ambulacral disc to posterior end of opisthosoma.

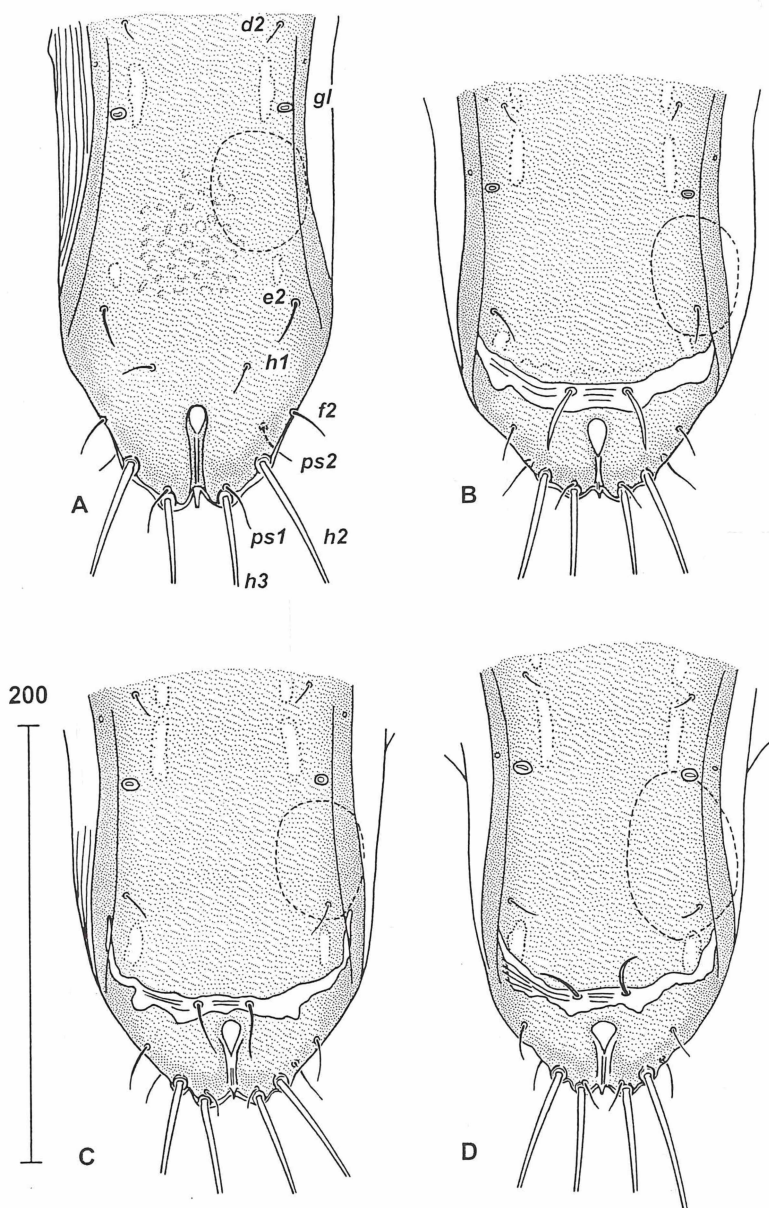


Fig. 3. Females, opisthonotum: A - *Triphyllochaeta charadrii* Dubinin, B - *T. vanelli* (Canestrini), C - *T. paravanelli* sp. n., D - *T. hyperschiza* (Gaud & Mouchet).

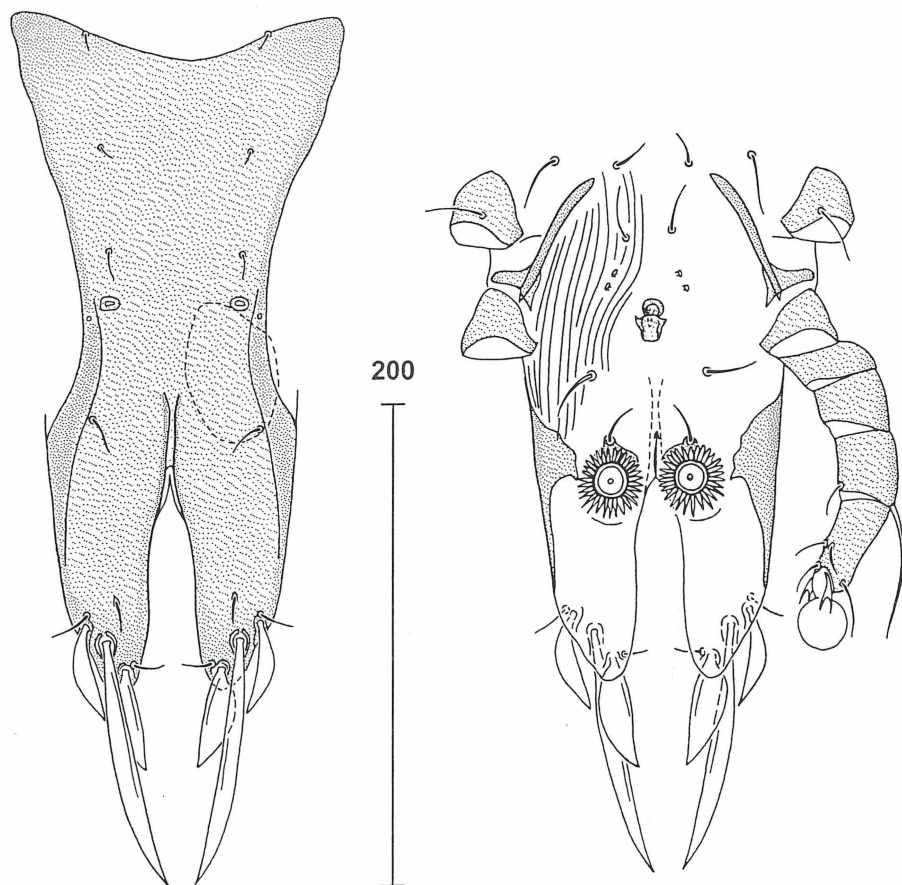


Fig. 4. *Triphyllochaeta hyperschiza* (Gaud & Mouchet), male hysteronotum (left) and ventral opisthosoma (right) view.

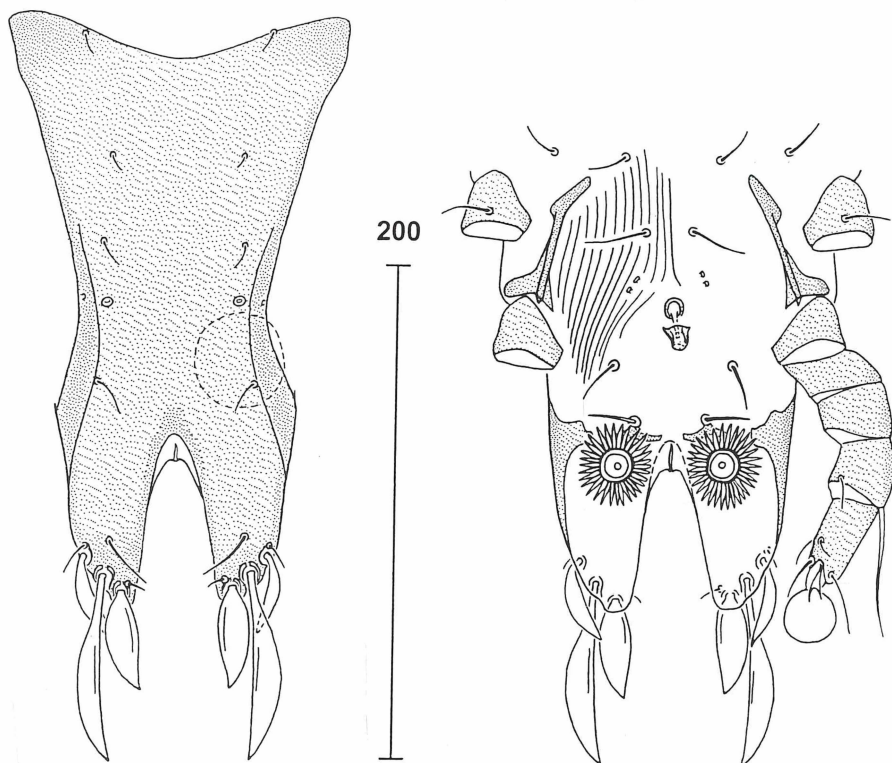


Fig. 5. *Triphyllochaeta vanelli* (Canestrini), male hysteronotum (left) and ventral opisthosoma (right) view.

DIFFERENTIAL DIAGNOSIS. *T. paravanelli* sp. n. is very similar to *T. vanelli*. In the males of the new species the length of idiosoma varies within limits 380-400, the terminal cleft is longer (75-85), and the distance between level of setae *e2* and anterior margin of terminal cleft is less than half of distance *e2*-*gl* (Fig. 1). Females are distinguished by hair-like setae *h1* (Fig. 3C). In males of *T. vanelli*, the idiosoma is shorter (345-370), the terminal cleft length is 65-72, and the distance between anterior margin of terminal cleft and setae *e2* is equal or more than half of distance *gl*-*e2* (Fig. 5); in females, setae *h1* are slightly enlarged, as thick needles (Fig. 3B).

3. *Triphyllochaeta hyperschiza* (Gaud & Mouchet, 1959) (Figs 4, 3D)

This species was originally described from the Spur-winged Lapwing *Vanellus spinosus* from Cameroon (Gaud & Mouchet 1959). Lately it was recorded on several African lapwings: the Blacksmith Lapwing *V. armatus*, the Crowned Lapwing *V. coronatus*, the Wattled Lapwing *V. senegallus* (Gaud 1972). In the course of the present study four new hosts among African and Asian species of lapwings were revealed. The drawings are based on specimens from *V. armatus*.

Material examined. 12♂, 19♀ from *Vanellus armatus*, Velddrif, Cape Prov., South Africa, leg. A. J. Baker, 30 November 1991, UAM 01396; ♂, 2♀ – Bloemnof, West Transvaal, Africa, 13 December 1956, leg. F. Zumpt, NU 3634; 2♂, 7♀ from the Black-winged Lapwing *V. melanopterus* (new host), Arrusi Plateau, Ethiopia, collector unknown, 14 February 1912, NU 8703; ♂, ♀ from *V. coronatus*, Tsessebe, Bechuanaland, Africa, 3 January 1956, leg. F. Zumpt, NU 3887; ♂, ♀ from the Grey-headed Lapwing *V. cinereus* (new host), Baoding, China, 29 April 1924, leg. Kiltren, UMMZ 63890; 3♂, 4♀ from the White-tailed Lapwing *V. leucurus* (new host), Bharatpur, Rajasthan, India, 17 February 1971, collector unknown, UGA 6784; ♂, 2♀ from the Senegal Lapwing *V. lugubris* (new host), Tete Pah, Zululand, Africa, 29 April 1955, leg. H. Peterson, NU 3808.

4. *Triphyllochaeta charadrii* Dubinin, 1951 (Figs 2, 3A)

Contrary to three previous species distributed on the lapwings (Vanellinae), this mite species occurs on some plovers of the genus *Charadrius* (Charadriinae). It was formerly recorded from the Little Ringed Plover *Ch. dubius curonicus*, the Mongolian Plover *Ch. mongolus mongolus*, and the Long-billed Plover *Ch. placidus* (Dubinin 1951, 1956).

T. charadrii is a distinctive species deviating from typical forms of the genus *Triphyllochaeta* by having some peculiar morphological characters, such as epimeres I fused Y-shaped and structure of hysteronotal shield in both sexes (Figs 2, 3A). Drawings are based on specimens from *Ch. mongolus*.

Material examined. 2♂ from *Charadrius mongolus stegmanni*, Darwin, Northern Territory, Australia, 7 April 1948, leg. H. G. Deignan, NU 8793; 2♂ from *Ch. mongolus mongolus*, Kraskino vil., Primoye Terr., Russia, 18 May 1946, leg. A. Gorchakova, ZISP 116; 5♂, 4♀ – Point Calimere, SE Madras, India, 14 April 1970, collector unknown, UGA 6583; 2♂, 1♀ from *Ch. mongolus schaeferi*, Chantabun, Thailand, 3 May 1937, leg. H. G. Deignan, NU 8798; 3♂, 3♀ from the Common Ringed Plover *Ch. hiaticula* (= *pyrrhothirax*) (new host), Simulue Island, W Sumatra, 24 December 1901, leg. W. L. Abbot, NU 8796; ♂, 5♀ from the Greater Sand Plover *Ch. leschenaulti* (new host), Bang Pu, Smutprakan, Thailand, 17 September 1965, collector unknown, NU 12541.

Key to species of *Triphyllochaeta*

1. Epimeres I fused Y-likely. In males hysteronotal shield with transversal striation from anterior margin to level of setae *e*₂; supranal concavity present, closed (Fig. 2). In females, anterior quarter of hysteronotal shield with transversal striation, posterior quarter of this shield uniformly dotted, without desclerotized band (Fig. 3A) : *T. charadrii*
- Epimeres I fused V-likely (Fig. 1). In males, hysteronotal shield without transversal striation, supranal concavity not expressed (Figs 1, 4, 5). In females, hysteronotal shield without striation, its posterior end with transversal desclerotized band (Figs. 3B-D) : 2

2. In males, legs IV not extending by ambulacral disc beyond lobar apices, anterior end of terminal cleft as acute angle, medial margins of cleft continuing onto hysteronotal shield as pair of median longitudinal ridges (Fig. 4). In females, length of hysteronotal glands exceeding half of opisthosoma width (Fig. 3D) *T. hyperschiza*
- In males, legs IV extending by ambulacral discs beyond lobar apices, anterior end of terminal cleft rounded, sclerotized ridges anterior to terminal cleft absent (Figs 1, 5). In females, length of hysteronotal glands less than half of opisthosoma width (Figs 3B, C) 3
3. In males, terminal cleft 65-72 in length, distance between anterior margin of terminal cleft and setae *e2* is equal or more than half distance *gl-e2* (Fig. 5). In females, setae *h1* slightly enlarged (Fig. 3B) *T. vanelli*
- In males, terminal cleft 75-85 in length, the distance between level of setae *e2* and anterior margin of terminal cleft is less than half distance *e2-gl* (Fig. 1). In females, setae *h1* setiform (Fig. 3C) *T. paravanelli* sp. n.

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Zusammenfassung

Eine neue Federmilbenart aus der Gattung *Triphyllochaeta* Dubinin, 1956 (Astigmata, Pterolichidae), *T. paravanelli*, wird vom Andenkiebitz *Vanellus versipennis* beschrieben. Es wurden alle bekannten Arten dieser Federmilbengattung untersucht und abgebildet. Neue Wirt-Milben-Beziehungen wurden gefunden. Ein Bestimmungsschlüssel für alle bekannten Arten wird aufgestellt.

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