



A revised diagnosis of the feather mite genus *Magimelia* Gaud, 1961 (Pterolichoidea: Pterolichidae: Magimeliinae) and the description of three new species

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Abstract

Three new mite species of the genus *Magimelia* (Astigmata: Pterolichidae) are described from the plumage of various lapwings (Charadriidae: Vanellinae): *M. breviloba* n. sp. from *Vanellus miles miles*; *M. thailandica* n. sp. from *V. indicus* (type-host), *V. duvaucelii* and *V. tricolor*; and *M. chilensis* n. sp. from *V. chilensis*. An extended host range for *M. dolichosikya* Gaud, 1961 is given. A revised diagnosis of the genus and a key to known species are presented.

Introduction

The feather mite genus *Magimelia* Gaud, 1961 (Pterolichidae: Magimeliinae) was originally based on a single species, *M. dolichosikya* Gaud, 1961, described from the white-headed lapwing *Vanellus (=Xiphidiopterus) albiceps* Gould in Africa (Gaud, 1961). In further investigations of feather mites of African birds (Gaud 1972), this species was recorded from two other species of African lapwings, the spur-winged lapwing *V. spinosus* (L.) and the wattled lapwing *V. senegallus* (L.) (Charadriidae: Vanellinae). In that paper this genus was used as a basis for the new subfamily Magimeliinae Gaud, 1972, established within the family Pterolichidae.

Mites of the genus *Magimelia*, as well as all other representatives of the subfamily Magimeliinae, live on the ventral side of vanes of flight feathers (Dabert & Ehrnsberger, 1999). Mites are located in narrow corridors formed by primary and secondary feather barbs. These mites are well adapted to these habitats, having a greatly elongated, parallel-sided and flat body covered with large dorsal shields, and legs inserted laterally. Males of this genus always possess well-developed opisthosomal lobes.

The present paper is a part of a general study of the systematics, phylogeny and host-parasite relationships of the feather mite subfamily Magimeliinae (see Dabert, 1997; Dabert & Ehrnsberger, 1999) and includes a redefinition of *Magimelia*, a key to its species, the description of three new species and new data on its host-parasite associations.

Materials and methods

The main part of the material used in the present study was received on loan from various museums. The mites were mounted in polyvinyl lactophenol medium and investigated using an Olympus BX50 with DIC (differential interference contrast). In species descriptions all measurements are given in micrometres. Idiosomal length was measured from the anterior margin of prodorsum to the posterior end of body (females) or opisthosomal lobes (males). Widths of idiosoma and hysteronotal shield were measured at the level of setae *c2*. Width of prodorsal shield was measured at its widest point posterior to setae *se*. The chaetotaxy nomenclature follows Gaud & Atyeo (1996) and the scientific names of the birds are those of Sibley & Monroe (1990).

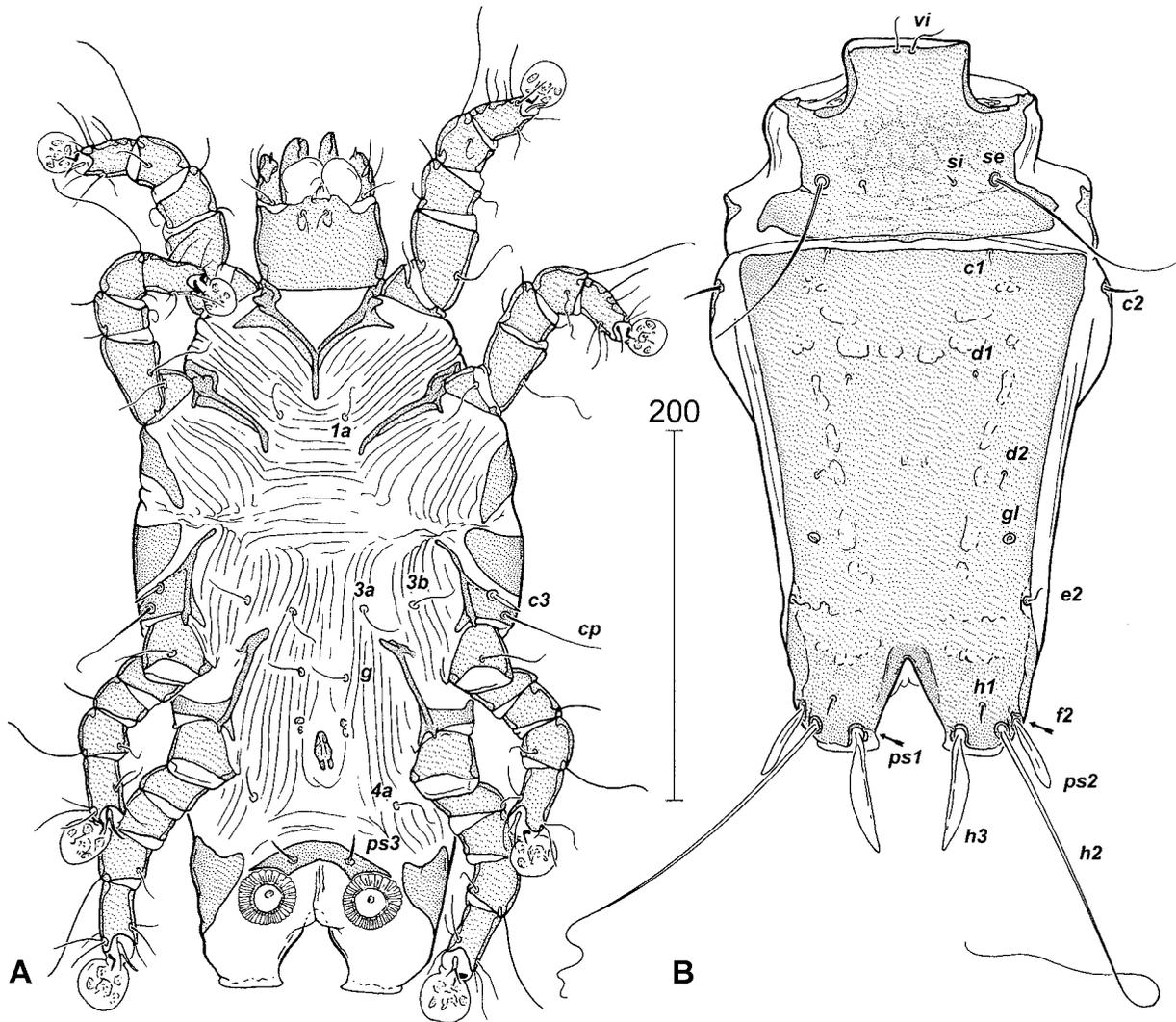


Figure 1. Male of *Magimelia breviloba* n. sp. A. Ventral view; B. Dorsal view. Designations of setae follow Gaud & Atyeo (1996).

Abbreviations used: AMU, Adam Mickiewicz University, Poland; NU, University of Nebraska, USA; UGA, University of Georgia, Athens, USA; UMMZ, University of Michigan, Zoological Museum, Ann Arbor, USA; USNM, US National Museum of Natural History.

Pterolichidae Trouessart & Mégnin, 1884
Magimeliinae Gaud, 1972

***Magimelia* Gaud, 1961**

Diagnosis

Both sexes: Idiosoma moderately elongated, with

well-developed dorsal shields. Hysteronotal shield with straight or slightly convex anterior margin; surface dotted, with or without pattern of transverse striation. Setae *vi* present. Dorsal hysteronotal setae of medial row short; setae *e1* absent. Setae *c2* needle-like. Setae *c3* lanceolate, short. Setae *e2* as short microsetae. Epimeres I fused, Y-shaped; sternum c. 1/3-1/2 of total length of epimeres. Sclerotisation of coxal fields I-IV poorly developed. Solenidion $\sigma 2$ on genu I absent. *Males:* Opisthosomal lobes well developed, gradually attenuate to apices or with ledge on lateral margins; lobar apices rounded or truncate, with very narrow terminal membrane. Terminal cleft with angular anterior end. Supranal concavity variable: open posterior to terminal cleft, or completely

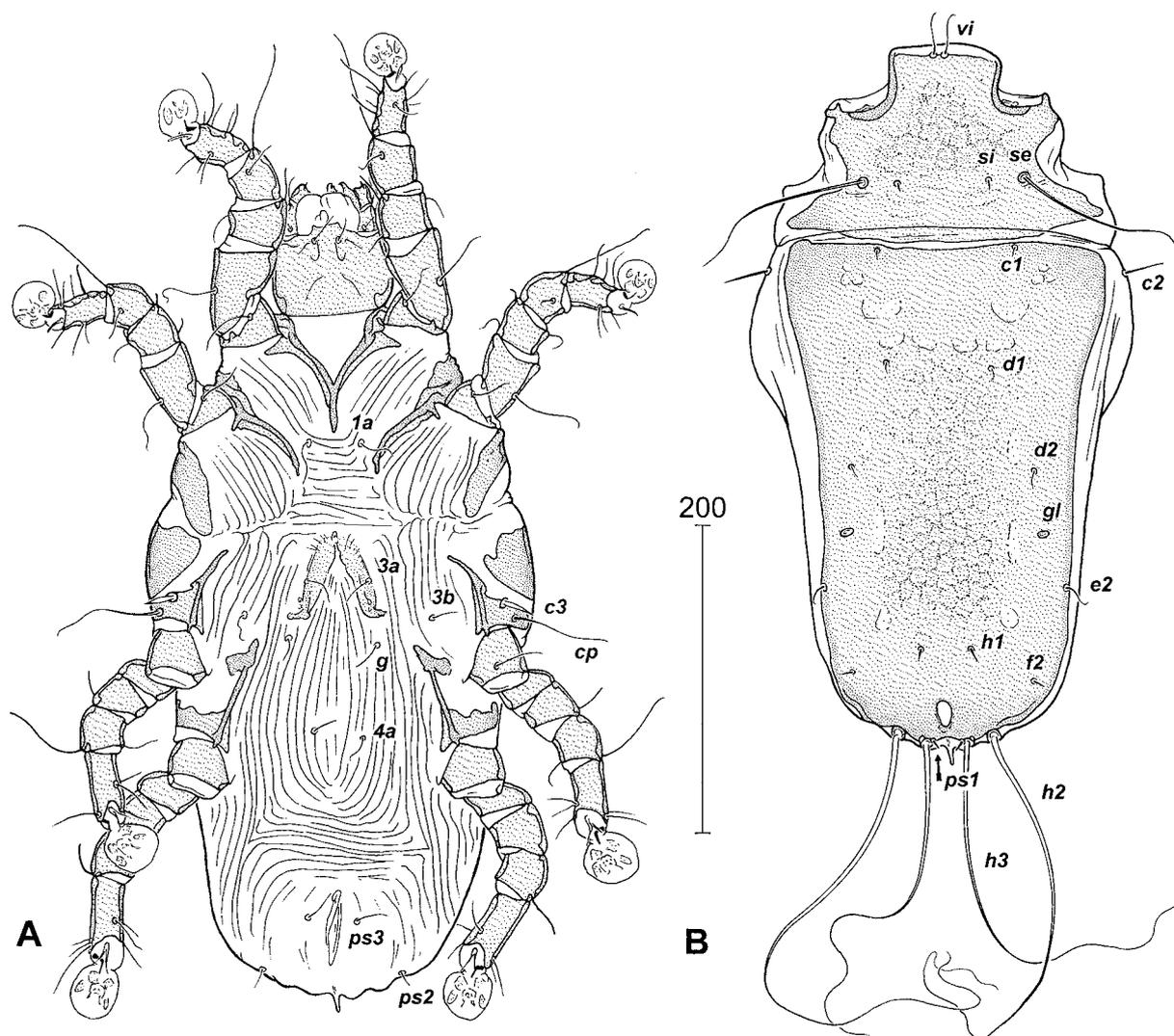


Figure 2. Female of *Magimelia breviloba* n. sp. A. Ventral view; B. Dorsal view.

fused with it and indistinct. Setae *h3* and *ps2* narrow, lanceolate or saber-shaped; setae *h2* as macrochaetae. Genital apparatus situated at level of trochanters IV or slightly posterior. Genital sheath in form of straight or hook-like tube. Paragenital sclerites usually absent, fused with opisthoventral shields if present. Genital acetabulae at level of trochanters IV. Opisthoventral shields well developed, triangular. Adanal shield in form of transverse sclerite between medial angles of opisthoventral shields. Setae *ps3* on adanal shield, setiform or needle-like. Adanal discs large, ovate or pear-shaped, with clear radial striation on corollae. Legs III and IV similar in size. Tarsus IV slightly longer than tarsus III, without apical apophysis. Se-

tae *e* and *d* of tarsus IV reduced to small pits. *Females*: Opisthosoma rounded. Hysteronotal shield entire. Surface usually with pattern of weakly sclerotised patches. Supranal concavity circular, closed or open posteriorly. Setae *h1* needle-like. Setae *f2*, *ps2* setiform or needle-like. Setae *h2* and *h3* as macrochaetae. Epigynum absent. External copulatory tube in form of small, cone-like extension, situated terminally or dorsally. Supranal concavity circular, closed or open posteriorly. Type-species: *M. dolichosikya* Gaud, 1961 by original description from *Xiphidiopterus* (= *Vanellus*) *albiceps* Gould, South Cameroon.

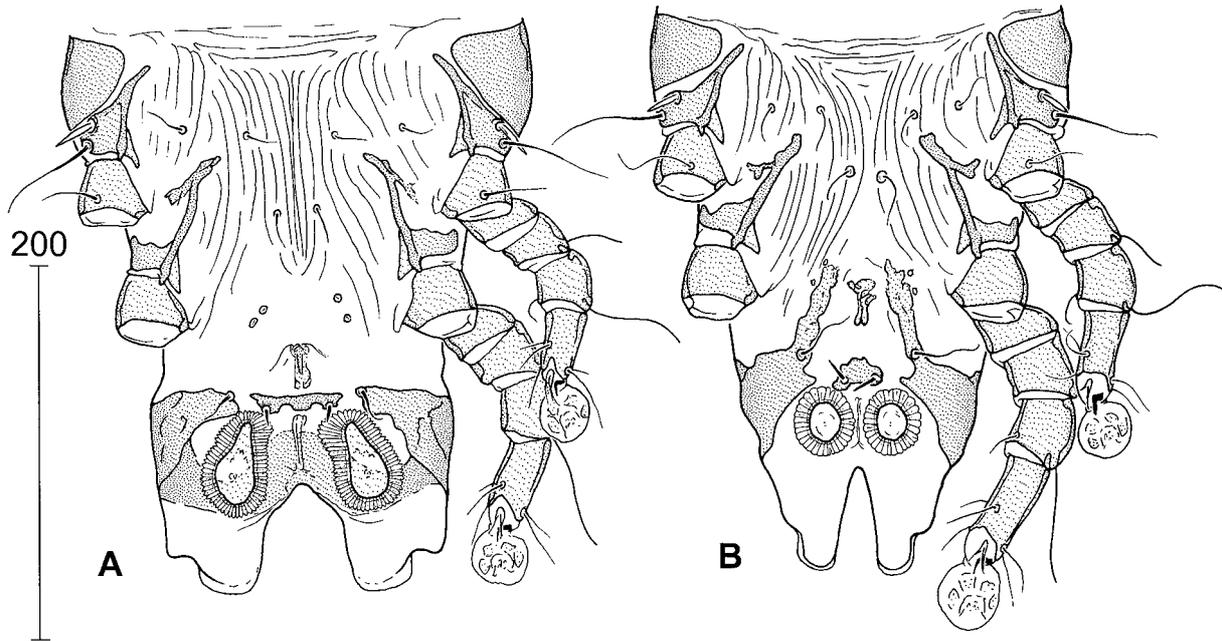


Figure 3. Males, ventral view. A. *Magimelia dolichosikya* Gaud, 1961; B. *M. thailandica* n. sp.

***Magimelia dolichosikya* Gaud, 1961** (Figures 3A, 4A, 5A)

Material examined: 2 males, 2 females from *Vanellus albiceps* Gould, Save River, 212 km SSE Beira, 21°35' S, 33°20' E, Zinave National Park, Inhambane District, Mozambique, 9 October, 1965, leg. W.W. Dalquist, UMMZ 19822; 1 male, 1 female from the same host, same data, UMMZ 211363; 1 male from *V. malabaricus* (Boddaert) (new host), Bhesaghal, C.P., India, 11 July, 1946, leg. W. Koely, UMMZ 141529; 1 male, 1 female from *V. crassirostris* (Hartlaub) (new host), Shambe, Sudan, 7 March, 1927, leg. W.L. Brown, NU 8696, USNM 309150.

Remarks

This species was originally described from the white-headed lapwing *Vanellus albiceps* Gould from the Cameroon (Gaud, 1961). Subsequently, it was recorded on other African lapwings: the spur-winged lapwing *V. spinosus* (L.) and the wattled lapwing *V. senegallus* (L.) (see Gaud, 1972). In the course of the present investigation, this mite species has been recorded on two new host species, the yellow-wattled lapwing *V. malabaricus* (Boddaert) and the long-toed lapwing *V. crassirostris* (Hartlaub).

***Magimelia breviloba* n. sp.**

Description (Figures 1A,B, 2A,B)

Male (holotype). Idiosoma length 383, width 235 (idiosoma size in 2 paratypes 395-400 × 210-220). Prodorsal shield 106 in length, 163 in width, with faint network pattern; scapular setae *se* separated by 103. Length of hysterosoma 280. Hysteronotal shield 270 in length, 188 in width, with slightly convex anterior margin, with weaker sclerotised patches in anterior region, along lateral margins and at base of lobes (Figure 1B). Opisthosomal lobes relatively short, with truncate apices; supranal concavity indiscernible; length of terminal cleft 43, width at level of setae *h3* 40. Setae *h2*, *h3* and *ps2* at same transverse level. Setae *h1* small, needle-like, c. 10 in length. Length of lanceolate opisthosomal setae: *ps2* 35, *h3* 65. Distances between setae and openings: *d2-gl* 34, *gl-e2* 32, *h3-h3* 57. Genital apparatus at level of trochanters IV, 19 in length, 8 in width; sheath of genital apparatus in form of slightly curved tube directed anteriorly. Genital sclerites absent. Adanal shield in form of large, stout, bow-like transverse sclerite (Figure 1A). Setae *ps3* setiform, 15-17 in length. Setae *4a* on striated tegument, anterior to opisthoventral shields. Adanal discs circular. Distances between ventral setae: *3a-3a* 56, *3a-g* 40, *g-4a* 60, *4a-4a* 80, *4a-ps3* 35, *ps3-ps3* 32.

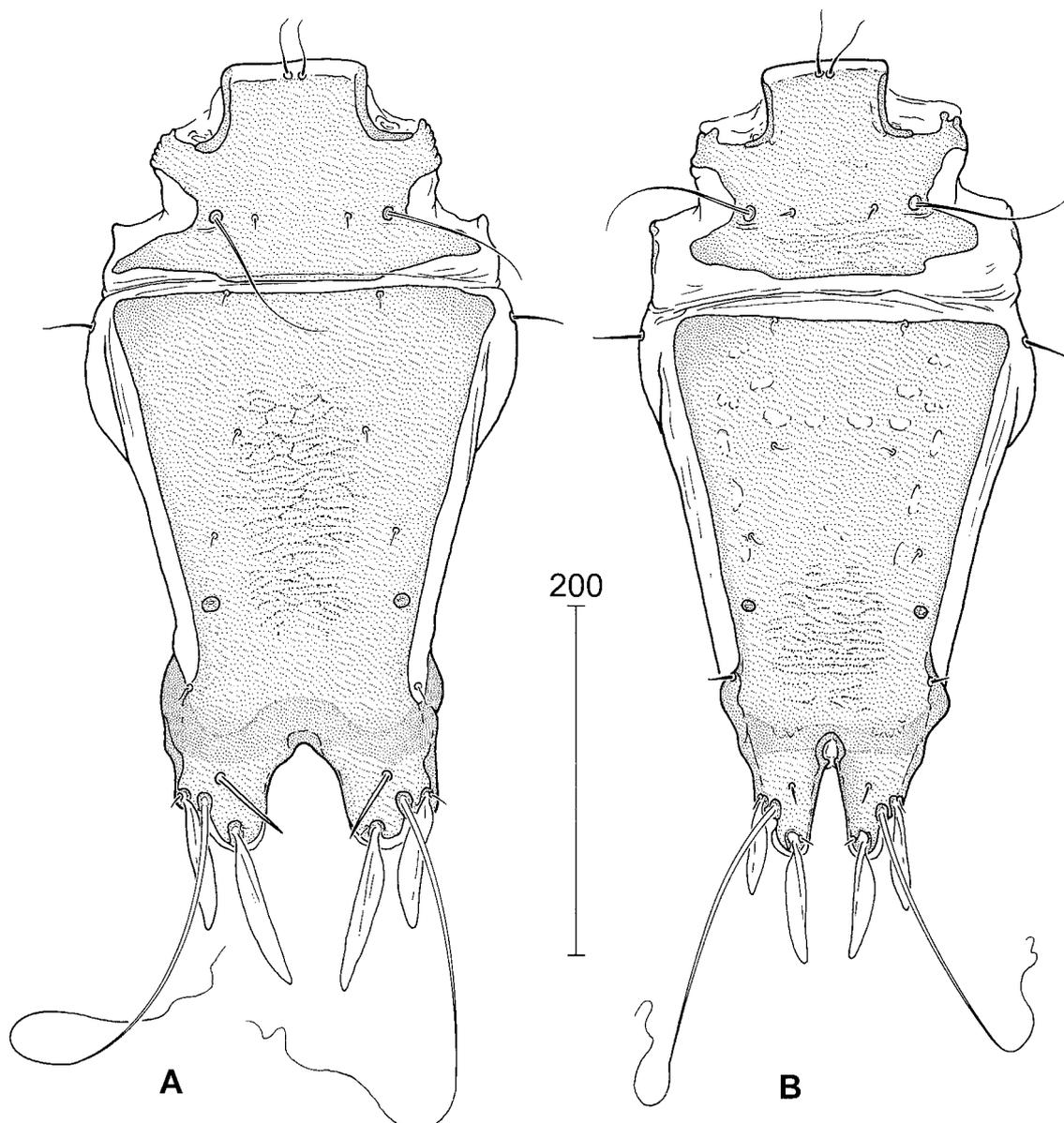


Figure 4. Males, dorsal view. A. *Magimelia dolichosikya* Gaud, 1961; B. *M. thailandica* n. sp.

Legs IV including ambulacral discs extend beyond lobar apices.

Female (paratype). Idiosoma length 452, width 238 (idiosoma size in 2 other paratypes 465-470 × 238-245). Prodorsal shield 120 in length, 120 in width; posterior region with faint network pattern; scapular setae *se* separated by 100. Length of hysterosoma 330. Hysteronotal shield 320 in length, 198 in width, with slightly convex anterior margin. Shield

with weaker sclerotised patches in anterior region and along lateral margins, with faint network pattern in median line. Posterior part of hysteronotum without incisions, entire. Posterior margin of opisthosoma rounded. Supranal concavity close to posterior margin of hysteronotal shield, closed (opens posteriorly in some paratypes). Setae *h1* in form of short needles, 8 in length, situated anterior to supranal concavity. External copulatory tube terminal, 12 in length (10-12 in other paratypes). Distances between setae and

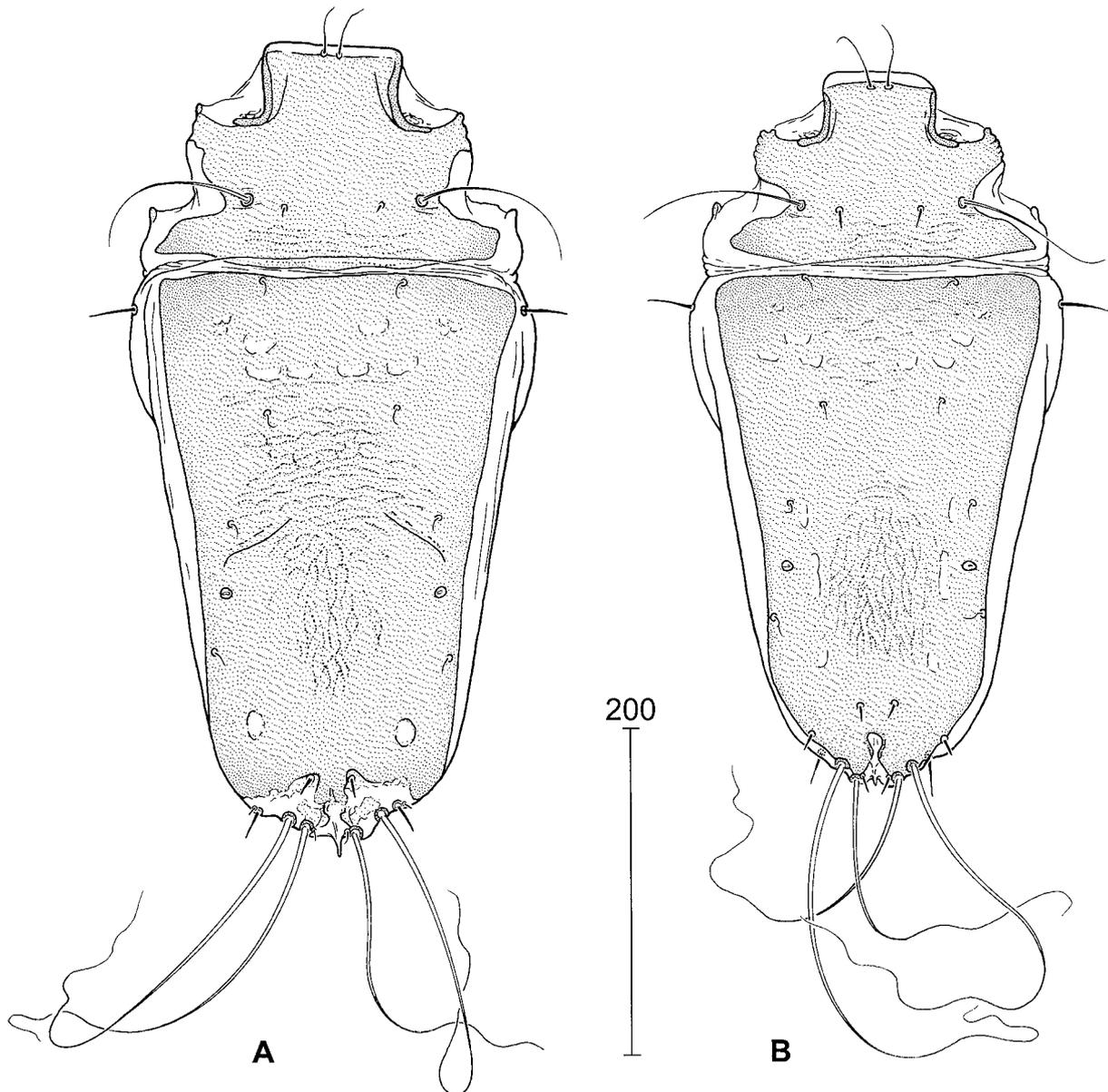


Figure 5. Females, dorsal view. A. *Magimelia dolichosikya* Gaud, 1961; B. *M. thailandica* n. sp.

openings: *d2-gl* 32, *gl-e2* 36, *e2-f2* 60, *h1-h3* 56, *h2-h2* 63, *ps1-ps1* 26. Legs IV including ambulacral discs extend beyond posterior margin of opisthosoma.

Differential diagnosis

M. breviloba n. sp. is readily distinguishable from other species of *Magimelia* by having short, truncate opisthosomal lobes in the males (Figure 1A). The wide bow-like adanal shield also characterises the males of this species. In males of three other *Magimelia* species

considered here, the opisthosomal lobes are attenuate with rounded apices carrying setae *h3* only, and the adanal shield has a different form and is significantly smaller (Figures 3A,B, 6B). Females of *M. breviloba* are similar to *M. thailandica* n. sp. (see below) in the structure of opisthosoma, but they are readily distinguished from the latter species by the longer external copulatory tube (10-12) and a network pattern on the prodorsal and hysteronotal shields. In the females of *M. thailandica*, the external copulatory tube is about

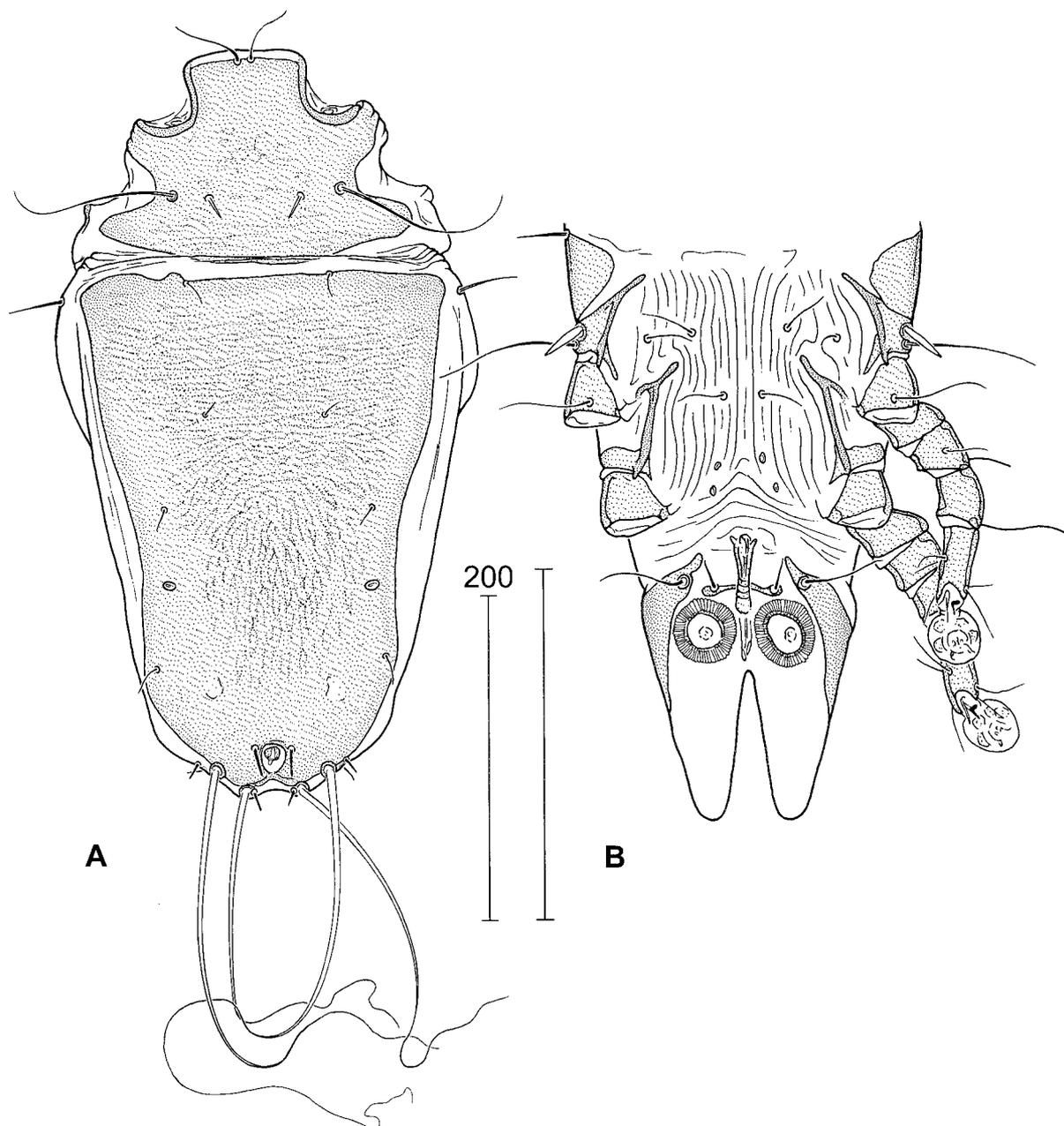


Figure 6. *Magimelia chilensis* n. sp. A. Female, dorsal view; B. Male, ventral view.

3-4 and dorsal shields have a weak striated pattern.

Type material: Holotype male, 2 male and 3 female paratypes from the masked lapwing *Vanellus miles miles* (Boddaert), Oenpelli, Arnhem Land, Australia, 23 September, 1948, leg. H.G. Deignan, UGA 2397, USNM 405639. Types are deposited at USNM; 1 male and 1 female paratype at AMU.

Etymology: From *brevis* (Latin, 'short') and *lobus* (Latin, 'lobe').

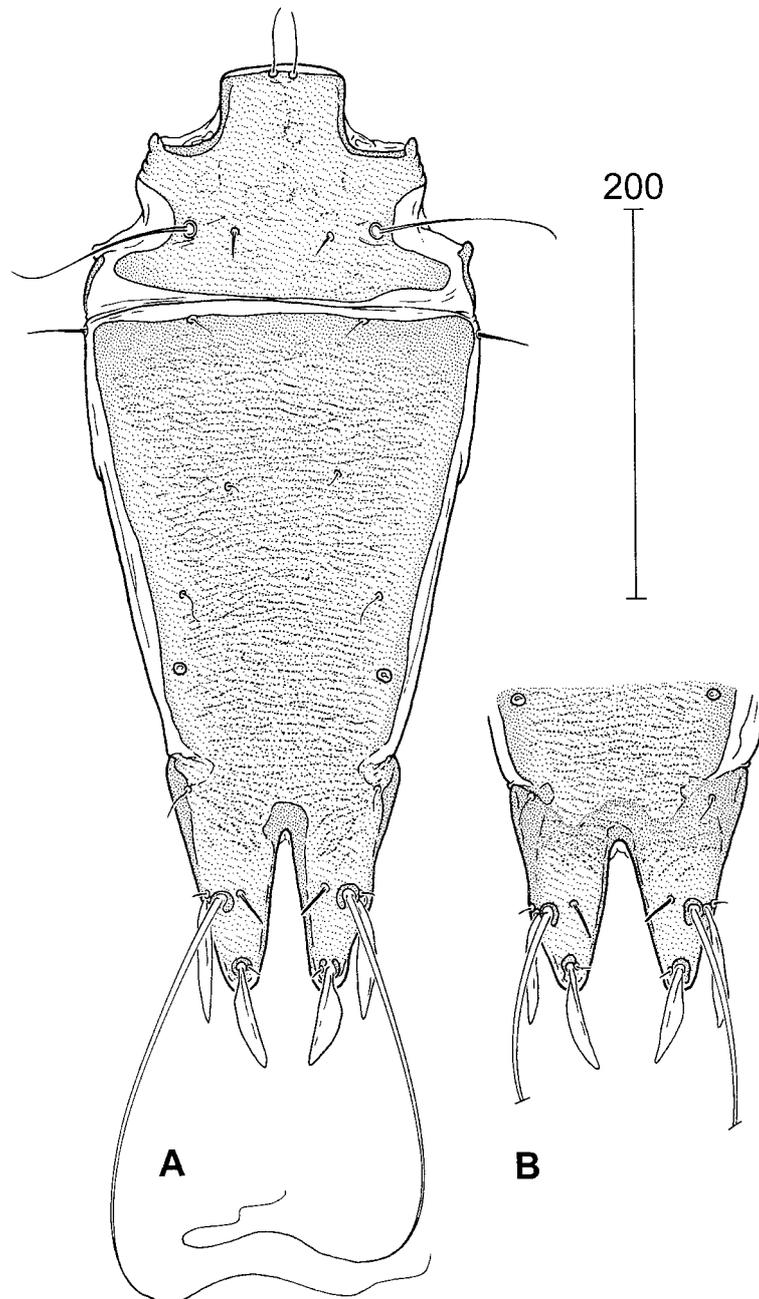


Figure 7. Male of *Magimelia chilensis* n. sp. A. Dorsal view; B. Variability of sclerotisation of opisthonotum.

***Magimelia thailandica* n. sp.**

Description (Figures 3B, 4B, 5B)

Male (holotype). Idiosoma length 458, width 244 (idiosoma size in 2 paratypes 445-460 × 213-235). Prodorsal shield 120 in length, 170 in width; posterior region with transverse striation; scapular setae *se* sepa-

rated by 95. Length of hysterosoma 332. Hysteronotal shield 308 in length, 188 in width, with straight anterior margin and transverse striation on posterior half. Opisthosomal lobes elongate, with rounded apices; supranal concavity open posteriorly; length of terminal cleft 53, width at level of setae *h3* 23. Setae *h2* slightly posterior to setae *ps2*. Setae *h1* setiform, c. 8

in length. Length of lanceolate opisthosomal setae: *ps2* 62, *h3* 67. Distances between setae and openings: *d2-gl* 32, *gl-e2* 45, *ps2-h3* 23, *h3-h3* 38. Sheath of genital apparatus a hook-like tube, 22 in length, 6 in width; its base slightly posterior to trochanters IV. Genital sclerites present; their posterior ends fused with medial angles of opisthoventral shields. Adanal shield in form of small, transverse sclerite with irregular margins, c. 24 in width. Setae *ps3* needle-like, 16 in length. Setae *4a* on opisthoventral shields. Adanal discs ovate, symmetrical. Distances between ventral setae: *3a-3a* 49, *3a-g* 35, *g-4a* 97, *4a-4a* 60, *4a-ps3* 14, *ps3-ps3* 17. Legs IV including ambulacral discs extended beyond lobar apices.

Female (paratype). Idiosoma length 472, width 250 (idiosoma size in 2 other paratypes 460–485 × 225–255). Prodorsal shield 118 in length, 194 in width, posterior region with delicate transverse striation; scapular setae *se* separated by 103. Length of hysterosoma 338. Hysteronotal shield 325 in length, 210 in width, with straight anterior margin; opisthosomal region with area of faint longitudinal striation. Shield with posterior region without incisions, entire. Posterior margin of opisthosoma rounded, with small terminal incision between setae *h3*. Supranal concavity close to posterior margin of hysteronotal shield, open posteriorly. Setae *h1* as short needles, 11–12 in length, situated anterior to level of supranal concavity. External copulatory tube terminal, c. 4 in length. Distances between setae and openings: *d2-gl* 40, *gl-e2* 33, *e2-f2* 75, *h1-h3* 48, *h2-h2* 48, *ps1-ps1* 18. Apical regions of tarsi IV extend beyond posterior end of opisthosoma.

Differential diagnosis

The males of *Magimelia thailandica* n. sp. differ clearly from *M. dolichosikya* and other species of the genus described here by having band-like genital sclerites flanking the genital apparatus laterally and a relatively small adanal shield of c. 20–25 in width (Figure 3B). The females are readily distinguished from the latter species by the absence of a pair of irregular incisions on the posterior part of hysteronotal shield. In the general form of the opisthosoma in both males and females, the new species is most closely related to *M. chilensis* n. sp. (see below). The females of *M. thailandica* differ from *M. chilensis* in the position of setae *h1* anterior to supranal concavity and the external copulatory tube situated terminally (Figure 5B).

In females of *M. chilensis*, setae *h1* are situated at the level of supranal concavity and a very short external copulatory tube is disposed in this concavity (Figure 6A).

Type-material: Holotype male, 1 male and 1 female paratypes from the red-wattled lapwing *Vanellus indicus atronuchalis* (Boddaert), Trang, Trang Prov., Thailand, 17 February, 1910, collector unknown, NU 11863, AMNH 735395; 1 male and 1 female paratypes from the same host, Forests of Timnon, S Annam (Trung Bô), Vietnam, November, 1939, leg. J.F. Rock, NU 8690, USNM 360597; 1 female paratype from the same host, no other data, NU 11861. Holotype and paratypes are deposited in the USNM.

Additional material: 2 males, 2 females from the river lapwing *V. duvaucelii* (Lesson), Ta Fang, Salwin, Thailand, 16 October, 1936, leg. H.G. Deignan, NU 8718, USNM 336157; 1 male and 1 female from the same host, Lay Song Hong, Trong, Lower Thailand, 28 October, 1896, leg. W.L. Abbott, NU 8720, USNM 60080; 4 males and 1 female from the Javanese lapwing *V. macropterus* (Wagler), Java, 12 July, 1909, leg. W. Palmer, NU 8708, USNM 219185.

Magimelia chilensis n. sp.

Description (Figures 6A,B, 7A,B)

Male (holotype). Idiosoma length 492, width 210 (idiosoma size in 11 paratypes 465–498 × 210–240). Prodorsal shield 122 in length, 175 in width; posterior region with transverse striation; scapular setae *se* separated by 100. Length of hysterosoma 364. Hysteronotal shield 350 in length, 197 in width, with straight anterior margin, with transverse striation except for opisthosomal lobes. Sclerotisation of opisthonotum variable (Figure 7A,B). Lobes elongate, with rounded apices; supranal concavity indiscernible; length of terminal cleft 80, width at level of setae *h3* 30. Setae *h2* slightly anterior to setae *ps2*. Setae *h1* needle-like, c. 22 in length. Length of lanceolate opisthosomal setae: *ps2* 60, *h3* 52. Distances between setae and openings: *d2-gl* 35, *gl-e2* 57, *ps2-h3* 34, *h3-h3* 50. Sheath of genital apparatus a straight tube directed posteriorly, with transversally striated apical half, 32 in length, 8 in width; base of genital apparatus positioned posterior to trochanters IV. Genital sclerites absent. Adanal shield in form of thin, dumbbell-shaped transverse sclerite of c. 42 in width. Setae *ps3* needle-like,

22-25 in length. Setae *4a* on opisthoventral shields. Adanal discs ovate, symmetrical. Distances between ventral setae: *3a-3a* 54, *3a-g* 35, *g-4a* 110, *4a-4a* 66, *4a-ps3* 4, *ps3-ps3* 33. Legs IV including ambulacral discs not reaching lobar apices.

Female (paratype). Idiosoma length 478, width 270 (idiosoma size in other 9 paratypes 460-504 × 255-270). Prodorsal shield 130 in length, 207 in width; posterior region with transverse striation; scapular setae *se* separated by 108. Length of hysterosoma 330. Hysteronotal shield 320 in length, 207 in width, with straight anterior margin. Shield with transverse striation in anterior half and with wavy irregular longitudinal striation in posterior region. Posterior part of hysteronotum without incisions, entire. Posterior margin of opisthosoma rounded, shallowly concave between setae *h3*. Supranal concavity close to posterior margin, closed (open posterior in some paratypes). Setae *h1* needle-like, 16 in length, situated at level of supranal concavity. External copulatory tube a very small spine of c. 3 in length (3-4 in other paratypes), situated on supranal concavity, with small, circular sclerite at base. Distances between setae and openings: *d2-gl* 47, *gl-e2* 45, *e2-f2* 65, *h1-h3* 24, *h2-h2* 67, *ps1-ps1* 27. Apical parts of tarsi IV extend beyond posterior margin of opisthosoma.

Differential diagnosis

Magimelia chilensis n. sp. is most similar to *M. thailandica* n. sp. in the general shape of the opisthosoma of the male. The males of *M. chilensis* differ from the latter species and also from other species of the genus by having a dumbbell-shaped adanal shield, straight genital sheath with a transverse striation in the apical region and a transversally striated hysteronotal shield (Figures 6B, 7A). The females differ from all known species by the position of the copulatory tube on the supranal concavity and by having setae *h1* disposed at the level of this concavity and close to its lateral margins (Figure 6A). In the males of *M. thailandica*, the adanal shield is represented by a small transversal sclerite, the genital sheath is hook-like and the hysteronotal shield is striated in the medial region only (Figures 3B, 4B). In females of the latter species, setae *h1* are situated far anterior to supranal concavity and the external copulatory tube has a terminal position (Figure 5B).

Type-material: Holotype male, plus 7 male and 5 female paratypes from the southern lapwing *Vanellus chilensis* (Molina), west bank of the Rio Paraguay along Riacho San Alberto, 21°50' S, 75°56' W, Dep. Alto Paraguay, Paraguay, 19 September, 1988, leg. S.M. Goodman, UMMZ 227481; 1 male and 1 female paratype from the same host, east bank of the Rio Paraguay, 1.5 km S Puerto Risso, Dep. Concepción, Paraguay, 18 September, 1988, leg. S.M. Goodman, UMMZ 227480; 1 female paratype from the same host, Mamotoco, Santa Marta, Colombia, 26 December, 1945, leg. M.A. Carriker, Jr, NU 8682, USNM 386784; 3 male and 2 female paratypes from the same host, 15 km E Barinas, Est. Barinas, Venezuela, 15 January, 1981, leg. C.T. Collins, UGA 11104. Holotype and paratypes are deposited at the UMMZ; 2 males and 2 female paratypes at the UAM.

Etymology: The new specific name is derived from the specific name of the host.

Key to the species of *Magimelia*

1. In males: adanal discs pear-shaped; lateral margins of opisthosomal lobes with well-expressed ledge carrying setae *h2* and *ps2* (Figures 3A, 4A). In females: posterior margin of hysteronotal shield with pair of incisions with irregular borders; setae *f2* and *h2* situated off this shield, only medial extension of hysteronotal shield reaches terminus of opisthosoma and setae *h3* (Figure 5A)
M. dolichosikya Gaud, 1961
 - In males: adanal discs ovate or circular; lateral margin of opisthosoma without ledge. In females: posterior end of hysteronotal shield convex and rounded, similar in shape to posterior end of opisthosoma; setae *f2*, *h2* positioned on this shield. 2.
2. In males: opisthosomal lobes short, with truncate apices; coxal setae *4a* situated on striated tegument (Figure 1A,B). In females: external copulatory tube about 10-12 in length (Figure 2A,B).
M. breviloba n. sp.
 - In males: opisthosomal lobes elongate, with rounded apices; coxal setae *4a* situated on opisthoventral shields (Figures 3B, 6B). In females: external copulatory tube less than 5 in length (Figures 5B, 6A). 3.

3. In males: paragenital sclerites present, their posterior ends fusing with medial angles of opisthoventral shields; adanal shield a small transverse sclerite of irregular form; sheath of genital apparatus a smooth hook-like tube directed anteriorly (Figure 3B). In females: setae *hl* situated anteriorly to supranal concavity; copulatory tube situated terminally (Figure 5B). *M. thailandica* n. sp.
- In males: paragenital sclerites absent; adanal shield dumbbell-shaped; genital sheath a straight tube directed posteriorly, its apical half with transverse striations (Figure 6B). In females: setae *hl* situated at level of supranal concavity; small copulatory tube situated in supranal concavity (Figure 6A). *M. chilensis* n. sp.

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