

THREE NEW CHEYLETID SPECIES (ACARI: CHEYLETIDAE) FROM THE NATIONAL MUSEUM OF NATURAL HISTORY ENTOMOLOGICAL COLLECTION, USA

ТРИ НОВЫХ ВИДА ХЕЙЛЕТИД (ACARI: CHEYLETIDAE) ИЗ ЭНТОМОЛОГИЧЕСКОЙ КОЛЛЕКЦИИ НАЦИОНАЛЬНОГО МУЗЕЯ НАТУРАЛЬНОЙ ИСТОРИИ, США

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ABSTRACT

Three new species of the family Cheyletidae (Acari: Prostigmata), *Mexeches shiva* sp.n. from India (Bombay), *Alliea chimaera* sp.n. from Australia (Queensland), and *Neochyletiella ardeola* sp.n. collected on *Ardeolla raloides* (Scopoli, 1769) (Ciconiiformes: Ardeidae) from Mozambique, are described and illustrated.

РЕЗЮМЕ

Описаны три новых вида сем. Cheyletidae (Acari: Prostigmata), *Mexeches shiva* sp.n. из Индии (Бомбей), *Alliea chimaera* sp.n. из Австралии (Квинсленд) и *Neochyletiella ardeola* sp.n. с *Ardeolla raloides* (Scopoli, 1769) (Ciconiiformes: Ardeidae) из Мозамбика.

INTRODUCTION

The family Cheyletidae (Acari: Prostigmata) includes about 370 species belonging to 73 genera of both predaceous and parasitic mites [Bochkov, 2004]. The type specimens for most of the cheyletid species are deposited in the following four institutions: the Institut royal Sciences naturelles Belgique, Brussels, Belgium (IRSNB), Zoological Institute Russian Academy of Sciences, St.-Petersburg, Russia (ZISP), Musée royal de l'Afrique centrale, Tervuren, Belgium (MRAC), and the National Museum of Natural History, Washington DC, USA (USNM). Currently, only the USNM collection has a significant number of undetermined cheyletids (about 400 specimens from different continents and hosts). We examined this material and found three new species: *Mexeches shiva* sp.n. from

India (Bombay), *Alliea chimaera* sp.n. from Australia (Queensland), and *Neochyletiella ardeola* sp.n. collected on *Ardeolla raloides* (Scopoli, 1769) (Ciconiiformes: Ardeidae) from Mozambique. In the descriptions, terminology for the idiosomal and leg chaetotaxy follows Grandjean [1939, 1944]. Setal compliments are in brackets. All measurements are in micrometers (µm).

Family Cheyletidae Leach, 1815

Genus *Mexeches* De Leon, 1962

Mexeches shiva Bochkov et Ochoa, sp. n.

Figs 1–2.

Female (7 paratypes). *Gnathosoma* 180–190 long, 135–140 wide. Peritremes arch-like, with 4 pairs of segments. Rostral shield (= protegmen) and basal part of rostrum (= tegmen) distinctly punctuated and covered with reticulate pattern. Palpal femur 60–70 long, 55–60 wide. Setae *dF* and *dG* (situated on palpal femur) thick and roughly barbed, monaxial, about 70 and 55 long, respectively; seta *l''G* (situated on palpal femur) barbed but almost 2 times finer than *dF* and *dG*, about 35 long. Setae (*v*)*F* filiform. Setae *d*, (*l*) of palpal tibia smooth filiform. Palpal claws with 7–9 teeth. Eupathidia *sul* and *acm* with numerous tines. Idiosoma rhomboid-like, 360–390 long, 340–350 wide. *Idiosomal dorsum*: Dorsal shields distinctly granulated. Propodonal shield 140–160 long, bearing eyes, 4 pairs of lateral setae and 6 pairs of strongly modified median setae. Lateral setae rod-like and roughly barbed, setae *vi*, *ve*, and *sci* 110–150 long, setae *sce* 225–240 long, 1.5–2 times longer than other propodonal setae. Median setae staghorn-like,

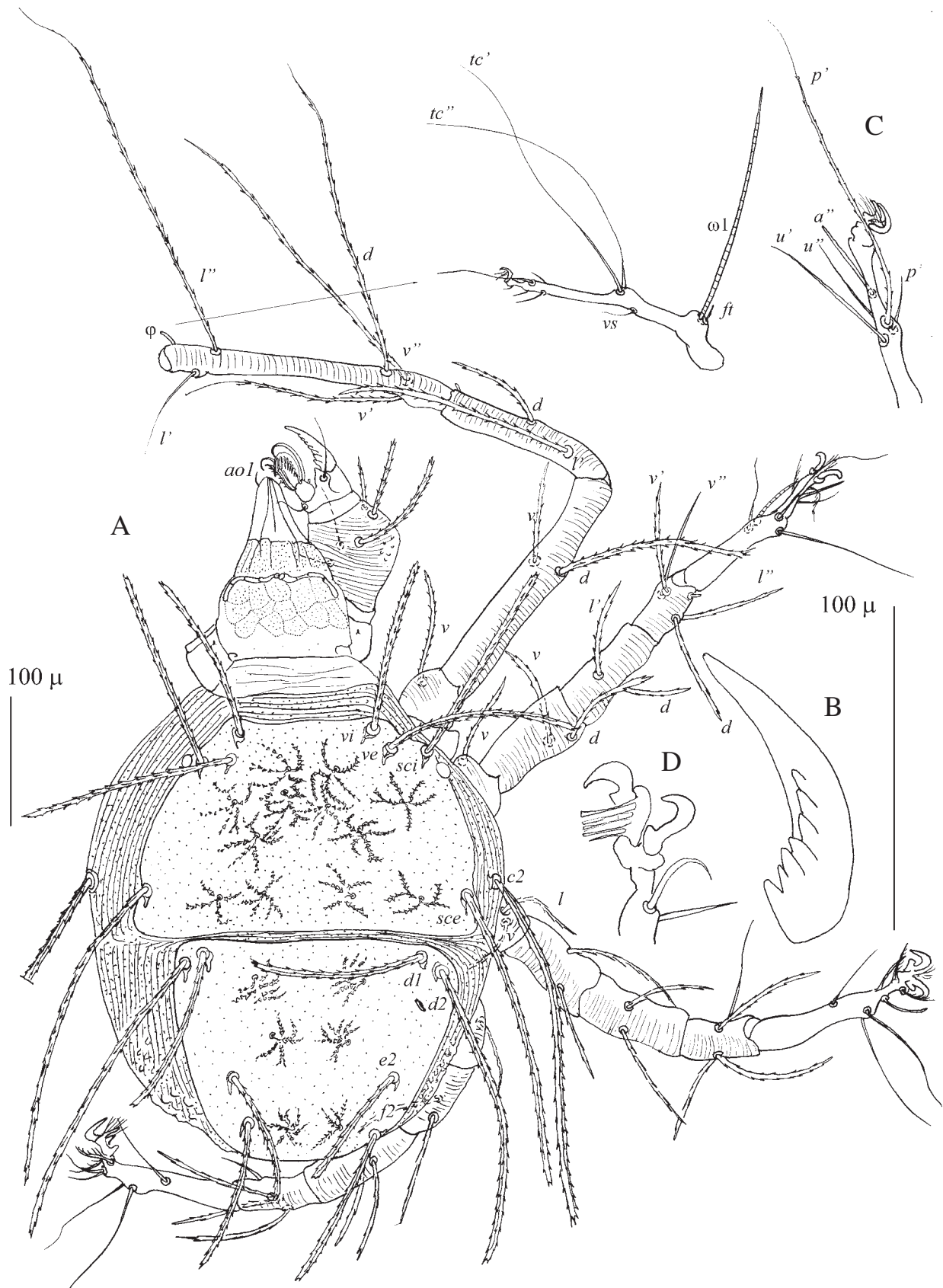


Fig. 1. *Mexecheles shiva* sp.n., holotype female. A — dorsal view; B — palpal claw, dorsal view; C — apical part of tarsus I, dorsal view; D — claws of tarsus IV.

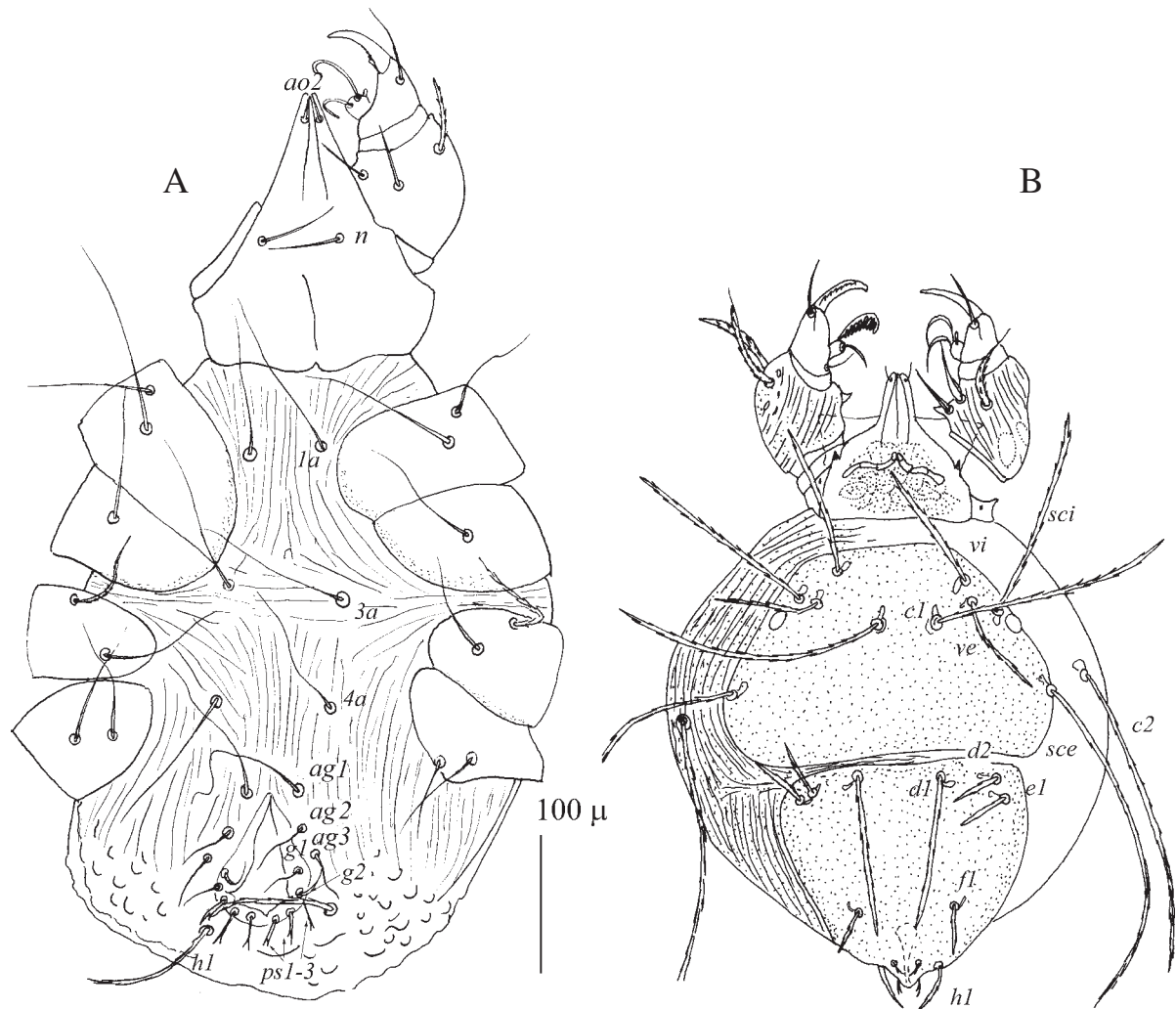


Fig. 2. *Mexecheles shiva* sp.n. A — female holotype, ventral view. B — male, dorsal view.

with rosary-like branches. Setae *c2* subequal in length to *sce*, 230–250 long. Hysteronotal shield 150–155 long, bearing 4 pairs of lateral and 3 pairs of median setae similar in shape as those on propodonal shield. Setae *d2*, *e1*, and *f2* 60–110 long, setae *e2* 2–3.5 times longer than these setae, 210–220 long, subequal in length to *sce* and *c2*. Bases of setae *d2* and *e2* situated close to each other, distance *e2*–*f2* about 8 times longer than *d2*–*e2*. Setae *h1* situated off hysteronotal shield, ventro-terminally, 50–55 long, similar in shape to dorso-lateral setae. Setae *h2* absent. Interscutal membrane striated and microgranulated, microtubercles and papillae present only in posterior third of hysterosoma. *Idiosomal venter*: All ventral setae filiform, smooth, excluding *3b* distinctly barbed. Setae *ag1*–*3*, *g1*–*2*, and *ps1*–*3* present; all pseudoanal setae bifurcate. *Legs* I very long, about 2 times longer than idiosoma, 760–780 long; tarsus I, including pretarsus, 70–80 long. Solenidion ω I very elongate, about 150 long, situated on well developed knob; guard

seta *ft* minute, 6–10 long; seta *p'Ta1* slightly serrate, very long, about 100 long, 4 times longer than respective pretarsus, seta *p''Ta* short, about 15 long. Setae (*tc*)*Ta* situated on distinct knob. Solenidion ω II situated ventro-laterally. Solenidion ϕ II situated dorsally. Claws of legs I without basal angles, claws of legs II–IV with distinct basal angles. Leg setation depicted in Fig. 1A. Setae on legs I to IV (solenidia in brackets): coxae 2–1–2–2, trochanters 1–1–2–1, femora 2–2–2–2, genua 2(1)–2–2–2, tibia 5(1)–4(1)–4–4, tarsi 9(1)–7(1)–7–7.

Measurements of holotype: Gnathosoma 190 long, 140 wide. Palpal femur 70 long, 60 wide. Idiosoma 380 long, 345 wide. Propodonal shield 150 long, hysteronotal shield 155 long. Leg I (trochanter-tarsus without pretarsus) 775 long, legs II–IV 380–390 long. Seta lengths: *vi* 115, *ve* 150, *sci* 140, *sce* 235, *c2* 245, *d2* 65, *e1* 90, *e2* 215, *f2* 105, *h1* 55, *wII* 150, and *ft* 8.

Male (4 paratypes). *Gnathosoma* about 120 long, 130 wide. Peritremes arch-like, with 3 pairs of

segments. Rostral shield and basal part of rostrum distinctly punctuated and covered with reticulate pattern. Lateral margins of rostral shield with pair of teeth. Gnathobase enlarged ventrally, covering most of rostrum. Palpal femur about 70 long, 55 wide, with triangular ventral spur. Setae *dF* and *dG* (situated on palpal femur) thick and roughly barbed, monaxial, about 55 and 45 long, respectively; seta *l''G* (situated on palpal femur) distinctly flattened and slightly serrate, about 50 long; setae *v''F* slightly inflated basally, smooth, *v'F* smooth, filiform; setae *d*, (*l*) of palpal tibia smooth filiform. Palpal claws with 6–7 teeth, situated on dorsal surface. Eupathidium *sul* with numerous tines, eupathidium *acm* smooth. Idiosoma rhomb-like, 310–330 long, 275–285 wide. *Idiosomal dorsum*: Dorsal shields distinctly granulated. Propodonal shield about 140 long, bearing eyes, 4 pairs of lateral (*vi*, *ve*, *sci*, and *sce*) and 1 pair of median (*c1*) setae – all setae rod-like, roughly barbed. Setae *sce*, *c1*, and *c2* each about 2 times longer than *vi*, *ve*, and *sci*. Hysteronotal shield about 130 long, bearing 4 pairs of lateral (*d2*, *e2*, *f2*, and *h1*) and 1 pair of median (*d1*) roughly barbed setae. Setae *d1* 2.8–3 times longer than other setae of hysteronotal shield. Setal lengths: *vi*, *ve*, and *d1* 80–90, *sci* about 55, *sce*, *c1*, and *c2* 170–180, *d2*, *e2*, *f2*, and *h* 20–35. Aedeagus about 40 long. Interscutal membrane striated and microgranulated, microtubercles and papillae absent. Setae *ps1*–3 and *gl*–2 present all bifurcate, 2 pairs of setae *ag* present. Legs as in female but tarsi III and IV with ventral solenidion in basal half.

Type material. Holotype female (USNM 81–2952, #1), 7 female and 4 male paratypes (USNM 81–2952, #2–12) ex host unknown, INDIA: Bombay intercepted at El Paso, Texas, USA, 11 March 1981, coll. J. Green (field number ELP 012809).

Type depositories. Holotype and 10 paratypes are deposited in USNM, one female paratype in ZISP.

Etymology. This species name is derived from the name Shiva who is a god-destroyer in Indian mythology referring to the predaceous mode of life of these mites and treated here as a noun in apposition.

Differential diagnosis. The last key of the genus *Mexeches* is given in the monograph of Summers and Price [1970], and only one species, was described after this revision [Jeffrey, 1976]. The females of this new species can easily be distinguished from all other representatives of the genus *Mexeches* by the absence of setae *h2* and extremely long setae *sce*, *c2*, and *e2*, which are

noticeably longer than other dorso-lateral setae. In other species of *Mexeches*, setae *h2* are present, and setae *sce*, *c2*, and *e2* are not much longer than other dorso-lateral setae. Among the eight species of the genus, *M. shiva* sp.n. is most similar to *M. votandinii* Jeffrey, 1976 from Scotland (Great Britain) [Jeffrey, 1976; 1977]. In both these species, legs I are at least twice as long as the idiosoma, and guard seta *ft* is minute. Both sexes of *M. shiva* differ from *M. votandinii*, in addition to the characters listed above, by the absence of the reticulate ornamentation on the dorsal shields and by setae *p'* being four times longer than the pretarsi. Furthermore, in males of *M. shiva*, the propodonal and hysteronotal shields each have a single pair of median setae, the gnathobase is enlarged ventrally, and the palpal femur has a ventral spur. In both sexes of *M. votandinii*, the dorsal shield is covered with reticulate ornamentation, setae *p'* are not longer than the pretarsi; in males of *M. votandinii*, the propodonal and hysteronotal shields each have three pairs of setae, the gnathobase is not enlarged ventrally, and the palpal femur is without a ventral spur.

Alliea Yunker, 1960

Alliea chimaera Bochkov et Ochoa, sp. n.

Fig. 3.

Female (5 paratypes). *Gnathosoma* 80–90 long, 80–85 wide. Rostrum (= protegmen) weakly ornamented, narrow triangular. Rostral shield (= tegmen) distinctly ornamented with short longitudinal folds. Peritremes arch-like, with 3 pairs of segments. Palpal femur 30–35 long, 38–40 wide, with 3 setae, *d* fan-like, (*v*) smooth filiform. Palpal femur with 2 fan-like setae, *d* and *l''*. Palpal tibia with 3 setae, *d* fan-like, *l''* foliate, and *l'* smooth filiform. Palpal claw with 6–7 elongated teeth on its inner surface. Eupathidia *sul* and *acm* strongly curved, with numerous tines; eupathidium *ul''* microseta, 5–6 times shorter than *ul'*. Idiosoma rhomboid-like, 230–240 long, 170–180 wide. *Idiosomal dorsum*: Dorsal shields devoid of ornamentation, all setae fan-like. Propodonal shield 90–100 long, 135–140 wide, bearing pair of eyes, 4 pairs of lateral setae, *vi*, *ve*, *sci*, and *sce*, all 25–28 long, 16–18 wide, and 7–8 pairs of neotrichial median setae, all 17–19 long, 10–12 wide. Scapular setae *c2* subequal in length to lateral setae. Hysteronotal shield joining to propodonal shield, with straight posterior margin, 110–120 long, bearing 4 pairs of larger lateral setae, *d2*, *e2*, *f2*, and *h2* and 9 pairs of smaller neotrichial median setae, these setae subequal to length of

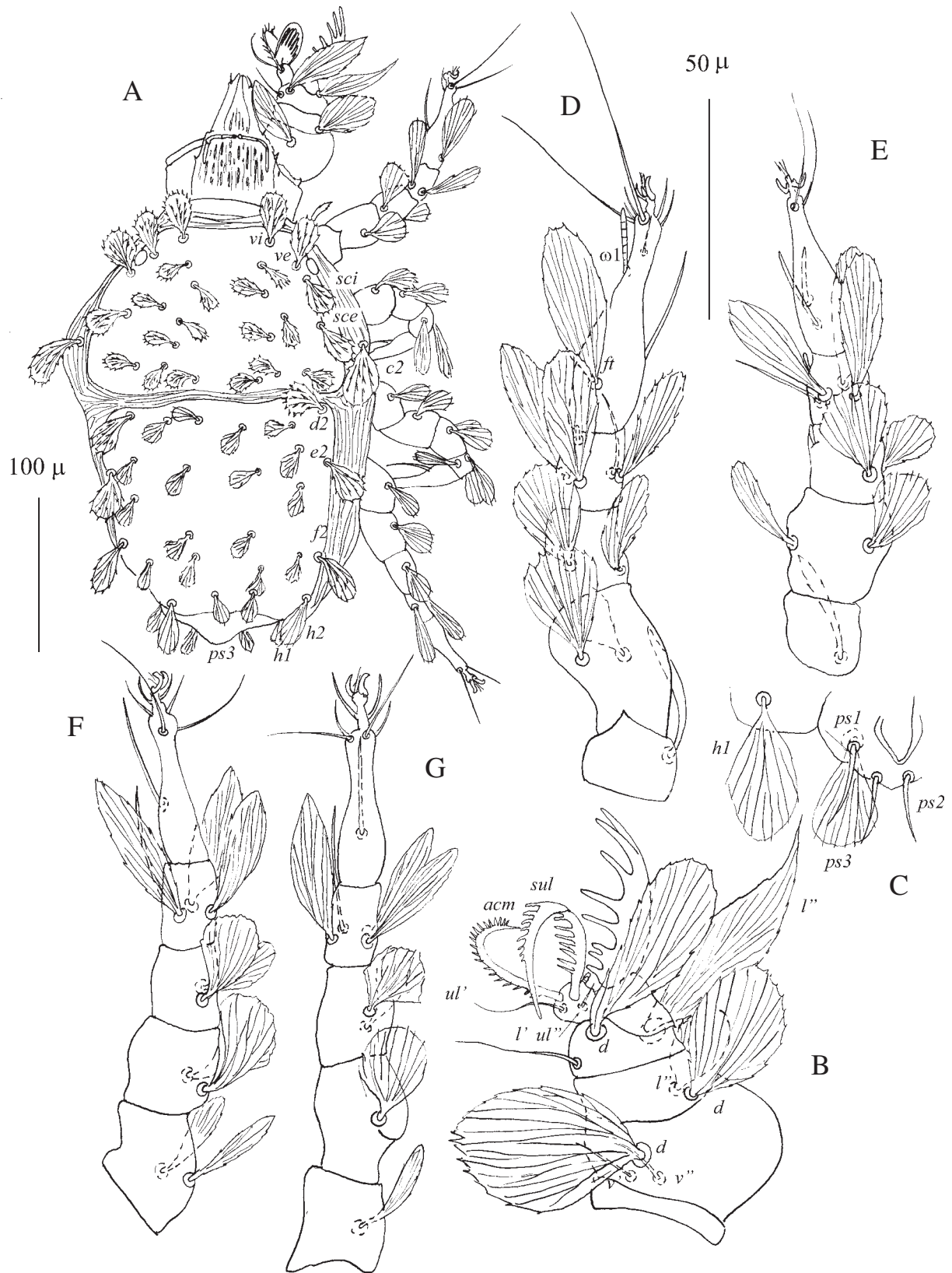


Fig. 3. *Alliea chimaera* sp.n., holotype female. A — dorsal view; B — palp, dorsal view; C — anal region; D–G — legs I–IV, respectively, dorsal view.

respective setae on propodonotal shield. Interscutal membrane striated, without additional ornamentation. *Idiosomal venter*: Setae *h1* situated ventrally, subequal to dorso-lateral setae. Setae *3b* lanceolate, *1a*, *3a*, *4a*, *ag1*–*3* and *g1*–*2* smooth filiform, *ps1*–*2* setiform, slightly thickened, *ps3* fan-like. *Legs*: Tarsi normal in shape, length/width ratio about 4:1. Legs I about 1.7 times shorter than idiosoma. Solenidion ω /I relatively short, 13–15 long, situated subapically, in dorso-lateral position; guard seta *ft* fan-like, almost 3 times longer than solenidion; distance between seta *ft* and ω /I bases about half of tarsal length, 23–25 long. Solenidion ω /II situated ventrally in median part of tarsus. Claws indistinct, without basal angles. Setae of tibia-trochanters I–IV lanceolate or fan-like, excluding *vTiI*–IV. Claws of legs I without basal angles, claws of legs II–IV with distinct basal angles. Leg setation depicted in Fig. 3 D–G. Setae on legs I to IV (solenidia in brackets): coxae 2–1–2–2, trochanters 1–1–2–1, femora 2–2–2–1, genua 2(1)–2(1)–2–2, tibia 4(1)–4(1)–4–4, tarsi 9(1)–7(1)–7–7.

Measurements of holotype: Gnathosoma 85 long, 80 wide. Palpal femur 35 long, 40 wide. Idiosoma 240 long, 175 wide. Propodonotal shield 95 long. Hysteronotal shield 115 long. Leg I and tarsus I (without pretarsus) 140 and 50 long, respectively. Solenidion ω /I 15 long, guard seta *ft* 40 long.

Type material. Holotype female (No. USNM 77–20051BO, #1) and 5 female paratypes (#2–6), AUSTRALIA: South East Queensland, Ipswich, ##27°38'S, 152°40'E, Swanbank, [Southern Cross Coal. Mine, ex mine props infested with lyctids and bostrichids (Coleoptera: Lyctidae and Bostrichidae)], 8 February 1977, coll. R.A. Yule.

Type depositories. Holotype and three paratypes are deposited in USNM, one paratype in ZISP, one paratype in Division of Entomology, CSIRO, Canberra, Australia.

Etymology. This species name is derived from the Greek word *chimaera* (the mythic beast consisting of three different animals that being a lion, goat, and serpent) referring to the unique character composition of these mites and treated here as a noun in apposition.

Differential diagnosis. The systematic position of this new species is unclear. It has most of the features of the tribe Cheyletiini Volgin, 1969, especially, such distinctive characters, as the fan-like setae of the palpal tibia and guard seta of tarsus I [Volgin, 1969; Bochkov, Fain, 2001]. It differs from all other representatives of the tribe by the

subapical position of solenidion ω /I, and by filiiform setae *v''F* of the palpal femur. The subapical position of solenidion ω /I characterizes species of the genus *Caudacheles* Gerson, 1968, which contains three described species, and the monotypic genus *Alliea* Yunker, 1960 [Yunker, 1960; Gerson, 1968; Gerson et al., 1999] whose phylogenetic relationships are also unclear [Bochkov, Fain, 2001; Bochkov, 2004]. The new species greatly differs from species of *Caudacheles* by the pectinate eupathidium *acm*, the presence of distinct teeth on the palpal claws, fan-like setae *d* and *l''* of the palpal tibia, and by the absence of the caudal disc, but shows many similarities in the leg and idiosomal setation with *Alliea laruei* Yunker, 1960. Unfortunately, the gnathosoma of the only known female specimen of *A. laruei* is lost and, therefore, we can not be sure whether this species belongs to the genus *Alliea* or if it should be placed in a separate genus. *Alliea chimaera* sp.n. differs from *A. laruei* by the presence of four setae and one solenidion on tibia I, 11–12 pairs of setae on the propodonotal shield, and 13 pairs of setae on the hysteronotal shield. In *A. laruei*, tibiae I has five setae and one solenidion, the propodonotal and hysteronotal shield bear 16 and 15 pairs.

***Neocheyletiella* Baker, 1949**

***Neocheyletiella ardeola* Bochkov et Ochoa, sp. n.**

Fig. 4.

Female (holotype). Body, including gnathosoma, 595 long, 355 wide. Gnathosoma 85 long. Gnathosomal setation typical for this genus. Palpal femora with 3 filiiform setae, serrate *d*, and smooth (*v*). Palpal genu with 2 filiiform setae, serrate *d* and smooth *l''*. Peritremes widely arched, with 5 pairs of segments. *Idiosomal dorsum*: Propodonotal shield rhomboid, 110 long in midline, maximum width 85, covered with indistinct longitudinal striations. All setae smooth. Setal lengths: *vi* 45, *ve* 40, *sci* 65, *sce* 90, *c1* 62, *c2* 100, *d1* 35, *d2* 110, *e1* 70, *e2* 95, *f2* 140, *h1* 145, and *h2* 150. *Idiosomal venter*: Epimera I and II fused. Seta lengths: *ag1* 125, *ag2* and *ag3* about 140, *ps1*–*3* and *g1* about 25. Leg setation typical for this genus except for tibiae II and IV each with 3 setae, long *d* and short (*l*).

Type material. Holotype female (No. USNM 53–20052BO, #1) and nymph paratype (USNM 53–20052BO, #2) from *Ardeolla ralloides* (Scopoli, 1769) (Ciconiiformes: Ardeidae), MOZAMBIQUE: [Lake Fuhwa], 21 July 1953, coll. Unknown.

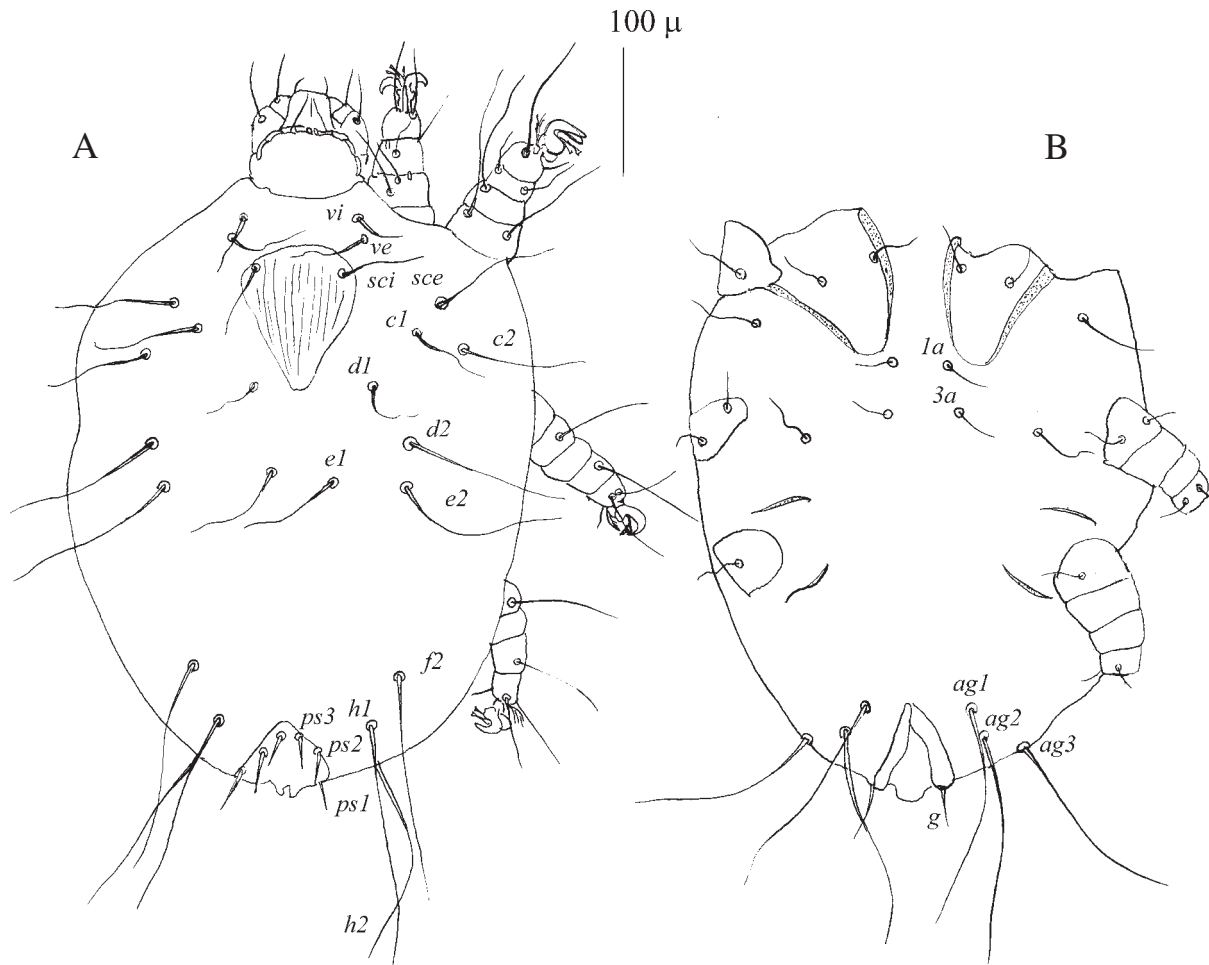


Fig.4. *Neochelyletiella ardeola* sp.n., holotype female. A — dorsal view; B — ventral view.

Type depositories. Holotype and paratype are deposited in USNM.

Etymology. The species name is derived from the generic name of the host and is a noun in the genitive case.

Differential diagnosis. The last key of the genus *Neochelyletiella* is given by Fain [1980], and only five species were described after this paper [Guilhon, Euzeby, 1984; Fain, Bochkov, 2002; Bochkov, OConnor, 2003]. This new species is clearly distinguished from all other 16 species currently known in the genus *Neochelyletiella* by the following combination of characters: epimera I and II fused, setae *dTiIII–IV* present, and all idiosomal setae smooth. The five known species that have epimera I and II fused and smooth idiosomal setae, i.e. *N. amandavae* Fain, 1972, *N. avicola* Fain, 1972, *N. athene* Fain et Bochkov, 2002, *N. lonchurae* Fain et Bochkov, 2002, and *N. megaphallos* (Lawrence, 1959) has *dTiIII* setae absent.

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