

NEW AND LITTLE KNOWN SPECIES OF THE FAMILY SYRINGOPHILIDAE (ACARI: CHEYLETOIDEA) FROM PARROTS (AVES: PSITTACIFORMES)

НОВЫЕ И МАЛОИЗВЕСТНЫЕ ВИДЫ КЛЕЩЕЙ СЕМЕЙСТВА SYRINGOPHILIDAE (ACARI: CHEYLETOIDEA) С ПОПУГАЕВ (AVES: PSITTACIFORMES)

A.V. Bochkov¹, A. Fain²

А.В. Бочков¹, А. Фэн²

¹Zoological Institute Russian Academy of Sciences, Universitetsaya emb. 1, St. Petersburg, 199034 Russia

²Institut royal des Sciences Naturelles de Belgique, Rue Vautier 29, B-1000, Bruxelles, Belgium

¹Зоологический институт Российской Академии Наук, Университетская наб. 1, Санкт-Петербург, 199034 Россия

²Бельгийский Королевский институт Естественных наук, Брюссель, Бельгия

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In a memory of Prof. V.B. Dubinin

ABSTRACT

Nine species of quill mites of the family Syringophilidae (Acari: Cheyletoidea) were collected from ethanol preserved specimens of parrots mostly died in the Antwerpen Zoo (Belgium). Among them, three new species are described: *Megasyringophilus dubinini* sp. n. from *Trichoglossus ornatus* from Indonesia (Sulawesi Is.), *Megasyringophilus platycercus* sp. n. from *Platycercus eximius* from Australia and *Terratosyringophilus lorcinus* from *Lorius garrulus* from Indonesia (Halmahera Is). The new host records and a key for the species of the genus *Megasyringophilus* are given.

РЕЗЮМЕ

Девять видов очинных клещей семейства Syringophilidae (Acari: Cheyletoidea) были собраны с заспиртованных тушек попугаев, павших в Антверпенском зоопарке (Бельгия). Три вида были описаны как новые для науки: *Megasyringophilus dubinini* sp. n. с *Trichoglossus ornatus* из Индонезии, *Megasyringophilus platycercus* sp. n. с *Platycercus eximius* из Австралии и *Terratosyringophilus lorcinus* с *Lorius garrulus* с Молуккских островов. Приведены находки клещей на новых хозяевах и ключ для определения видов рода *Megasyringophilus*.

Mites of the family Syringophilidae (Acari: Cheyletoidea) are permanent monoxenous or oligoxenous parasites inhabiting quills cavities of feathers [Kethley, 1970]. Study of syringophilid

mites associated with parrots begun only in few passed years. The first syringophilid species from these hosts, *Neoaulobia puylaerti* (Skoracki et Dabert, 1999) from *Poicephalus senegalus* (Tropical Africa, Togo), was described by Skoracki and Dabert [1999]. Later on, Fain and co-authors [2000] described eight new syringophilid species and three new genera from different parrot species. Finally, Bochkov and Perez [2002] described five new species and two new mite genera from Mexican parrots, and Skoracki and Dabert [2002] found a new species *Picobia poicephali* Skoracki et Dabert, 2002 on an African parrot, *Poicephalus senegalus*. Thus, the fauna of syringophilids associated with Psittaciformes has included 16 species of the six genera until now.

The present paper deals with the descriptions of the syringophilid species. The material used in this work was collected by the first author from the ethanol preserved parrots. These birds had died in the Antwerpen Zoo during the quarantine period and then they were brought to the laboratory of Prof. Fain (Institut royal des Sciences Naturelles de Belgique, Bruxelles).

MATERIAL AND METHODS

Mites for the study using light microscopy were prepared on slides in Hoyer's medium. The nomenclature of idiosomal setae follows that of Fain [1979] in the version adapted for the family Syringophilidae [Bochkov, Mironov, 1998] and

the chaetotaxy for the legs is that of Grandjean [1944]. All the measurements in descriptions are given in micrometers (μm). The Latin names of birds follow the checklist of Howard and Moore [1991]. Holotypes and most part of the paratypes are deposited in the Institut royal des Sciences Naturelles de Belgique, Bruxelles (IRSNB). Other paratypes are deposited in the Zoological Institute of the Russian Academy, St. Petersburg, Russia (ZIN).

SYSTEMATIC PART

**Genus *Neoaulobia*
Fain, Bochkov et Mironov, 2000**

This genus includes six species parasitizing parrots of various genera [Fain et al., 2000; Bochkov, Perez, 2002].

Neoaulobia agapornis

Fain, Bochkov et Mironov, 2000

Fig. 1.

Material examined. 5 females and 5 males from *Agapornis fisheri*, Tanzania (specimen 1); 5 females from the same host species and locality (specimen 2); 5 females from the same host species and locality (specimen 3). 10 females and 5 males from *Agapornis personata*, Tanzania. 10 females from *Agapornis roseicollis*, Namibia. 10 females from *Agapornis tarantana*, Ethiopia. *N. agapornis* is collected from all mentioned hosts for the first time. The male of this species was unknown, therefore we provide its description.

Male (5 specimens from *Agapornis fisheri*). Body length, including gnathosoma, 475–510, width

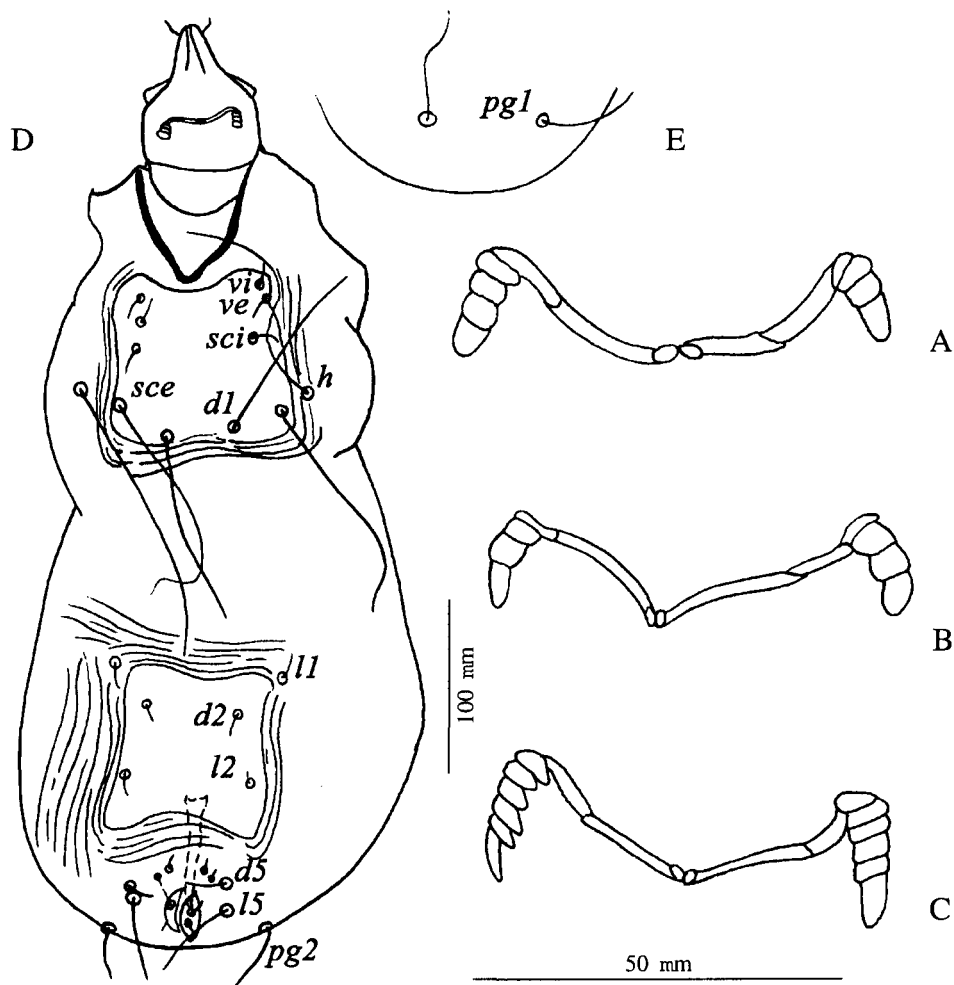


Fig. 1. *Neoaulobia agapornis* Fain et al., 2000. Female peritremes (A–C): A — specimen from *Agapornis personata*, B — specimen from *Agapornis roseicollis*, C — specimen from *Agapornis tarantana*. Male from *Agapornis personata* (D–E): D — dorsal view, E — opisthosoma, ventral view.

at the level of seta *h* bases 155–165. Gnathosoma: Hypostomal apex without protuberances. Transverse branch of peritremes with 1–2 chambers, longitudinal branch with 3 chambers. Idiosoma: Hysterosomal plate present. Length of setae: *vi* 18–23, *ve* 23–25, *sci* 20–25, *sce* 110–125, *h* 135–155, *d1* 115–120, *d2* and *l2* 15–18, *d5* 18–23, *l1* 20–25, *l5* 35–40, *pg1* 50–60, *pg2* 20–25, *pg3* lacking. Leg chaetotaxy as in the female.

Remarks. The female of this species was originally described from *Agapornis nigrigenis* from Zambia [Fain et al., 2000]. Now, it is known from five hosts of the genus *Agapornis*. The mites from three hosts from Tropical Africa i.e. *A. fisheri*, *A. personata* and *A. nigrigenis* and also the mites from *A. roseicollis* from Namibia are very similar. While the mites from *A. tarantana* from Ethiopia slightly differ from them. In the females of these mites the transverse branch of peritremes consists of 5–6 segments (Fig. 1A–B), the length of seta *l4* is 46–62. In the females from other host species, the transverse branch of peritremes consists of 3–4 segments (Fig. 1C), the length of seta *l4* is 57–105. It is difficult to state that the mites from *A. tarantana* belong to a separate species or we have an example of geographical variability in this case. The second solution seems more preferable because the ranges of seta *l4* variability are overlapped in the mites from *A. tarantana* and *A. roseicollis* (Namibia), 69 (57–85). These setae are usually about 90 in the mites from the Afrotropical parrots (70–105).

***Neoaulobia mexicana* Bochkov et Perez, 2002**

Material examined. 5 females and 2 males from *Aratinga pertinax*, Brazil (specimen 1). 3 females from the same host and locality (specimen 2). *N. mexicana* has been collected from this host for the first time.

Remark. This species was described from *Aratinga canicularis* from Mexico [Bochkov, Perez, 2002]. It apparently restricted to the genus *Aratinga*.

Genus *Megasyringophilus*

Fain, Bochkov et Mironov, 2000

This genus has included four species until now, all of them are parasites of various parrots genera [Fain et al., 2000; Bochkov, Perez, 2002].

Megasyringophilus kethleyi

Fain, Bochkov et Mironov, 2000

Material examined. 1 female and 3 nymphs from *Brotogeris versicolurus versicolurus*, Brazil. Female from *Aratinga pertinax*, Brazil. *M. kethleyi* is collected from these hosts for the first time.

Remark. This species was described from *Aratinga jandaya* from Brazil [Fain et al., 2000].

Probably, it infests the parrots of the genus *Aratinga* and closely related genera.

Megasyringophilus cyanocephala

Fain, Bochkov et Mironov, 2002

Material examined. 1 female from *Psittacula europatria*, India. 5 females from *Psittaculakrameri*, India. *M. cyanocephala* is collected from these hosts for the first time.

Remark. This species was described from *Psittacula cyanocephala* from India [Fain et al., 2000]. At present, it is known from the three species of the genus *Psittacula* and, probably, *M. cyanocephala* is the specific parasite of this genus.

***Megasyringophilus dubinini* sp. n.**

Fig. 2.

Type material. **Holotype** female (T-Sy-N 24 ZIN), male and 3 teleonymph paratypes from *Trichoglossus ornatus*, Indonesia (Sulawesi Is.). Other collection data and number of broken skin (ZIN) absent. Holotype is deposited in ZIN.

The female specimen in our collection is in rather poor condition. However some characters of this specimen make it possible to recognize it as a new species.

Female (holotype). Body length, including gnathosoma, 1300, width at the level of seta *h* bases 300. Gnathosoma: Hypostomal apex slightly ornamented, without median protuberances and with 2 pairs of small finger-like lips. Peritremes M-shaped, each transverse branch with 5 chambers, each longitudinal branch with 10 chambers. Cheliceral digit dentate, with 2–3 teeth. Idiosomal dorsum: Stylophore constricted posteriorly. Propodosomal plate weakly sclerotized, with indistinct margins. Seta *sce* bases situated behind the level of seta *h* bases. Hysterosomal plate absent. Length of setae: *vi* 50, *ve* 70, *sci* 430, *sce* 420, *h* 430, *d1* 460, *d2* 420, *d4* ?, *d5* ?, *l1* ?, *l2* ?, *l4* ?, *l5* 520. Distance between seta *l1* and *d2* bases 140 and between seta *d2* and *l2* bases 150. Venter: Length of setae: *pg1* 215, *pg2* 100, *pg3* 260. Legs: coxae III and IV weakly sclerotized. Setae *sc III* and *sc IV* extending beyond respective genua. Setae *p* ♂ *p* ♀ with numerous tines. Setae *tc III–IV* more 1.5–2 times shorter than *tc III–IV*. Claws of legs III and IV with basal angles.

Male (paratype). Body length, including gnathosoma 1155, width 290. Length of setae: *vi* 35, *ve* 40, *sci* ?, *sce* 185, *h* 172, *l1* ?, *d5* 30, *l5* ?, *pg1* 115, *pg2* 90, *pg3* 140.

Etymology. This species is named in honor of recognized acarologist, Prof. V.B. Dubinin.

Differential diagnosis. The female of this new species differs from all other species by the

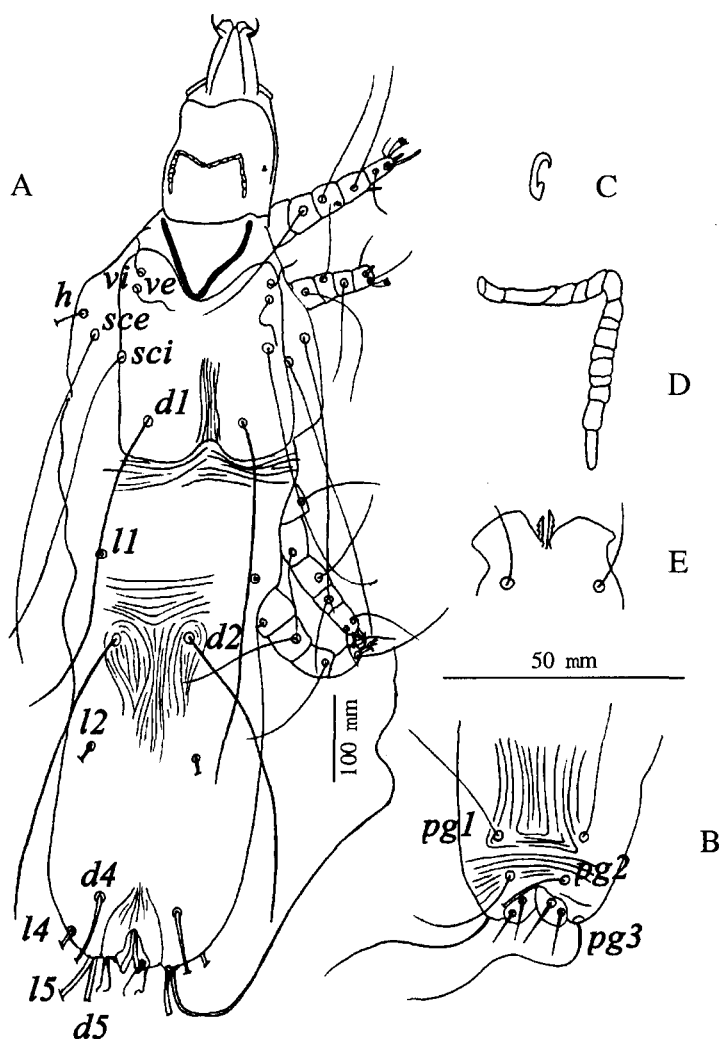


Fig. 2. *Megasyringophilus dubinini* sp. n., female. A — dorsal view; B — opisthosoma, ventral view; C — claw of tarsus III; D — peritreme; E — hypostomal apex, ventral view.

short setae *ve* (70, subequal *vi*). It also is distinguished from *M. cyanocephala* and *M. platycercus* sp. n. by the presence of basal angles in the tarsal claws. It differs from *M. kethleyi*, *M. trichoglossus* Fain et al., 2000 and *M. rhynchopsittae* Bochkov et Perez, 2002 by the absence of median protuberances on the hypostomal apex.

***Megasyringophilus platycercus* sp. n.**

Figs. 3–4.

Material examined. **Holotype** female, 4 female and 2 male paratypes from *Platycercus eximius*, Australia. The **holotype** and 5 paratypes are deposited in IRSNB, the one paratype in ZIN.

Female (holotype). Body length, including gnathosoma, 1310 (1310–1430 in 4 paratypes), width at the level of seta *h* bases 370 (350–370).

Gnathosoma: Hypostomal apex without median protuberances and 2 pairs of small finger-like lips. Peritremes M-shaped, each transverse branch with 2–3 chambers, each longitudinal branch with 6–7 chambers. Cheliceral digit dentate, with 3 teeth. Idiosomal dorsum: Stylophore slightly constricted posteriorly. Propodosomal plate weakly sclerotized, with indistinct margins. Seta *sce* bases situated at the level of seta *h* bases. Hysterosomal plate absent. Length of setae: *vi* 130 (120–140), *ve* 280 (260–310), *sci* 395 (380–410), *sce* 415 (400–450), *h* 405 (400–420), *d1* 380 (360–390), *d2* 415 (410–430), *d4* 500 (500–550), *d5* 550 (550–600), *l1* 395 (360–400), *l2* 415 (410–430), *l4* 475 (460–490), *l5* 535 (520–560). Distance between seta *l1* and *d2* bases 120 and between seta *d2* and *l2* bases 130.

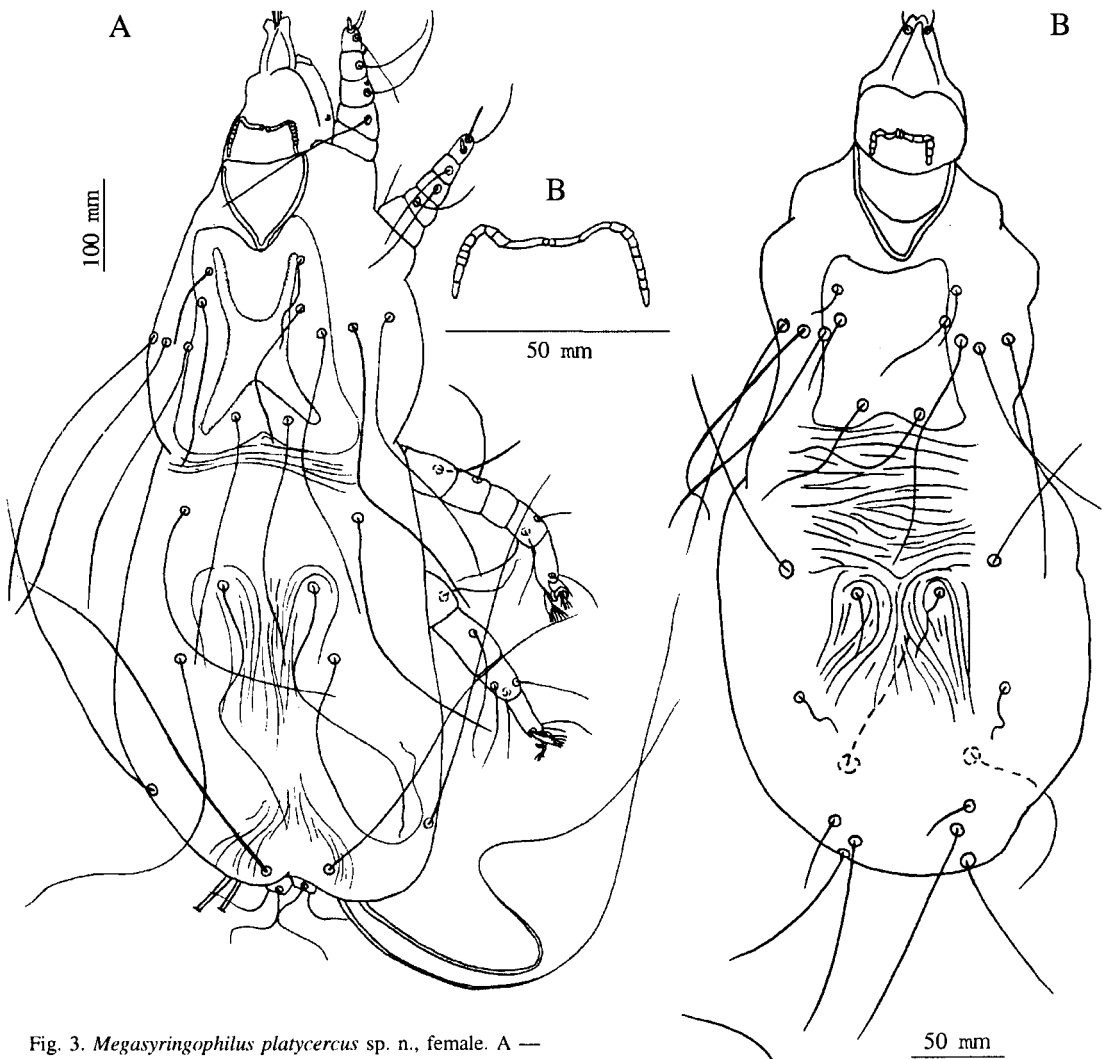


Fig. 3. *Megasyringophilus platycercus* sp. n., female. A — dorsal view; B — peritemes.

Venter: Length of setae: *pg1* 210 (200–230), *pg2* 235 (230–250), *pg3* 300 (290–340), *g1* 105 (100–105), *g2* 175 (160–180), *a1* and *a2* 120 (110–120). Legs: coxae III and IV weakly sclerotized. Setae *sc III* and *sc IV* extending beyond respective genua, 900–100 in length. Setae *p¹* and *p²* with numerous tines. Setae *tc III–IV* 1.5 times shorter than *tc III–IV*. Claws of legs III and IV without basal angles.

Male (2 paratypes). Body length 1000–1020, width 290–300. Length of setae: *vi* 50, *ve* 105–110, *sci* 260–280, *sce* 290–320, *h* 360, *d1* 150–170, *d2* 55–60, *d5* 45–50, *l1* 280, *l2* 60–65, *l5* 260–280, *pg1* 170–185, *pg2* 230–255.

Differential diagnosis. The female of this new species is closely related to *M. cyanocephala* by the absence of the basal angles on tarsal claws of the legs III and IV. It differs by the following

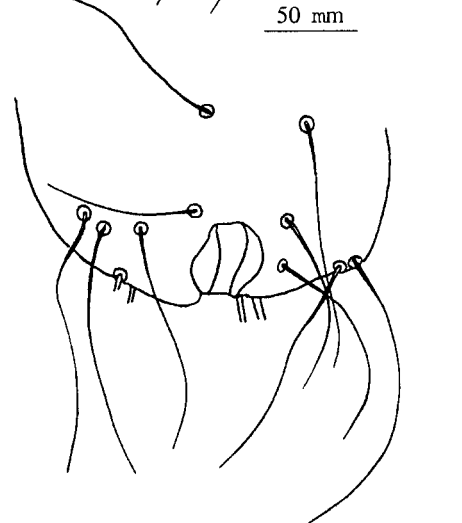


Fig. 4. *Megasyringophilus platycercus* sp. n. A — female opisthosoma, ventral view; B — male, dorsal view.

characters. In the female of *M. platycercus* sp. n., the stylophore is constricted posteriorly, the seta *sci* bases are situated at the level of seta *h* bases, the genital setae *g2* are long, subequal to *pg1*. In the female of *M. cyanocephala*, the stylophore is rounded posteriorly, seta *sci* bases are situated posterior the level of seta *h* bases, the genital setae *g2* are short, more than 2 times shorter than *pg1*.

**KEY TO THE GENUS MEGASYRINGOPHILUS
FAIN, BOCHKOV ET MIRONOV, 2000**

Females

1. Claws of tarsal legs III and IV with basal angles 3
— Claws of tarsal legs III and IV without basal angles 2
2. Stylophore constricted posteriorly. Seta *sci* bases situated at the level of seta *h* bases. Genital setae *g2* long, subequal to *pg1* *M. platycercus* sp. n.
— Stylophore rounded posteriorly. Seta *sci* bases situated posterior the level of seta *h* bases. Genital setae *g2* short, more than 2 times shorter than *pg1* *M. cyanocephala* Fain et al., 2000
3. Setae *tc*[♂] and *tc*[♀] of the tarsi III and IV unequal in length 4
— Setae *tc*[♂] and *tc*[♀] of the tarsi III and IV subequal in length *M. trichoglossus* Fain et al., 2000
4. Seta *sce* bases situated posterior the level of seta *h* bases. Hypostomal apex without median protuberances or with weakly developed median protuberances 5
— Seta *sce* bases situated at the level of seta *h* bases. Hypostomal apex with 3 well developed median protuberances *M. kethleyi* Fain et al., 2000
5. Ratio of setae *vi* and *ve* 1 : 4
..... *M. rhynchopsittae* Bochkov et Perez, 2002
— Ration of setae *vi* and *ve* 1 : 1.4
..... *M. dubinini* sp. n.

**Genus Terratosyringophilus
Bochkov et Perez, 2002**

This genus has included 2 species until now, the one from them is associated with parrots, while the second species infests the columbiform birds [Bochkov, Perez, 2002].

Terratosyringophilus loricinus sp. n.

Fig. 5.

Type material. Holotype female, 5 female paratypes from *Lorius garrulus*, Indonesia (Halmahera Is.).

Additional material. 3 females from *Trichoglossus haematodus*, Sumbawa. Holotype and 3 paratypes are deposited in IRSNB, 2 paratypes in ZIN.

Female (holotype). Body length, including gnathosoma, 1210 (1130–1345 in 5 paratypes), width at the level of seta *h* bases 265 (240–270). Gnathosoma: Peritremes M-shaped, each transverse branch with 6–7 chamber, each longitudinal branch with 10–11 chambers. Idiosomal dorsum: Propodosomal plate weakly sclerotized, not divided. Length of setae: *ve* 165 (160–170), *sci* 185 (170–190), *sce* 385 (360–390), *h* 385 (380–390), *d1* 390 (380–410), *d2* 375 (360–380), *d4* and *d5* 35 (35–40), *l1* 365 (360–375), *l2* 360 (360–380), *l4* 385 (380–385), *l5* 420 (400–450). Distance between seta *l1* and *d2* bases 40 (35–50), and between *d2*–*l2* 115 (100–115). Venter: Length of setae: *pg1* 235 (225–240), *pg2* 260 (250–260), *pg3* 280 (280–300), *g1* and *g2* about 30, *a1* and *a2* about 25. Legs: coxae III and IV weakly sclerotized. Setae *sc3* and *sc4* not extending beyond respective genua, 36 (30–46) in length. Setae *p*♂*p*♀ with numerous tines. Setae *tc*[♂]III–IV about 2 times longer *tc*[♀]III–IV.

Differential diagnosis. The female of this new species is closely related to *C. forpi* Bochkov et Perez, 2002 from *Forpus cyanopygius* from Mexico [Bochkov, Perez, 2002]. It differs by the following characters. In *C. lari* sp. n., the transverse branch of peritremes is segmented, the seta *d2* bases are situated closer to *d1* than to *l2*, and the setae *sc3*, *sc4* are relatively short, they are not extending beyond respective genua. In the female of *C. forpi*, the transverse branch of peritremes is not ornamented, the seta *d2* bases are situated closely to *d1* than to *l2*, and the setae *sc3*, *sc4* are long, they are extending beyond respective genua.

**Genus Castosyringophilus
Bochkov et Perez, 2002**

This genus has included 2 species until now. One species is known as a parrot parasite and another one parasitizes columbiform birds [Bochkov, Perez, 2002].

Castosyringophilus mucuya (Casto, 1980)

Material examined. From parrots: 3 females from *Brotogeris versicolurus*, Brazil (specimen 1). 2 females from the same host and locality (specimen 2). 10 females and 5 males from *Trichoglossus haematodus* (specimen 1), Indonesia (Sumbava Is). 5 females from the same host and locality (specimen 2). 5 females from *Bolborhynchus aymara*, South America.

From pigeons: 2 females from *Scardafella squamata*, Brazil. 5 females from *Petrophassa plumifera*, Australia. *C. mucuya* has been collected from all these hosts for the first time.

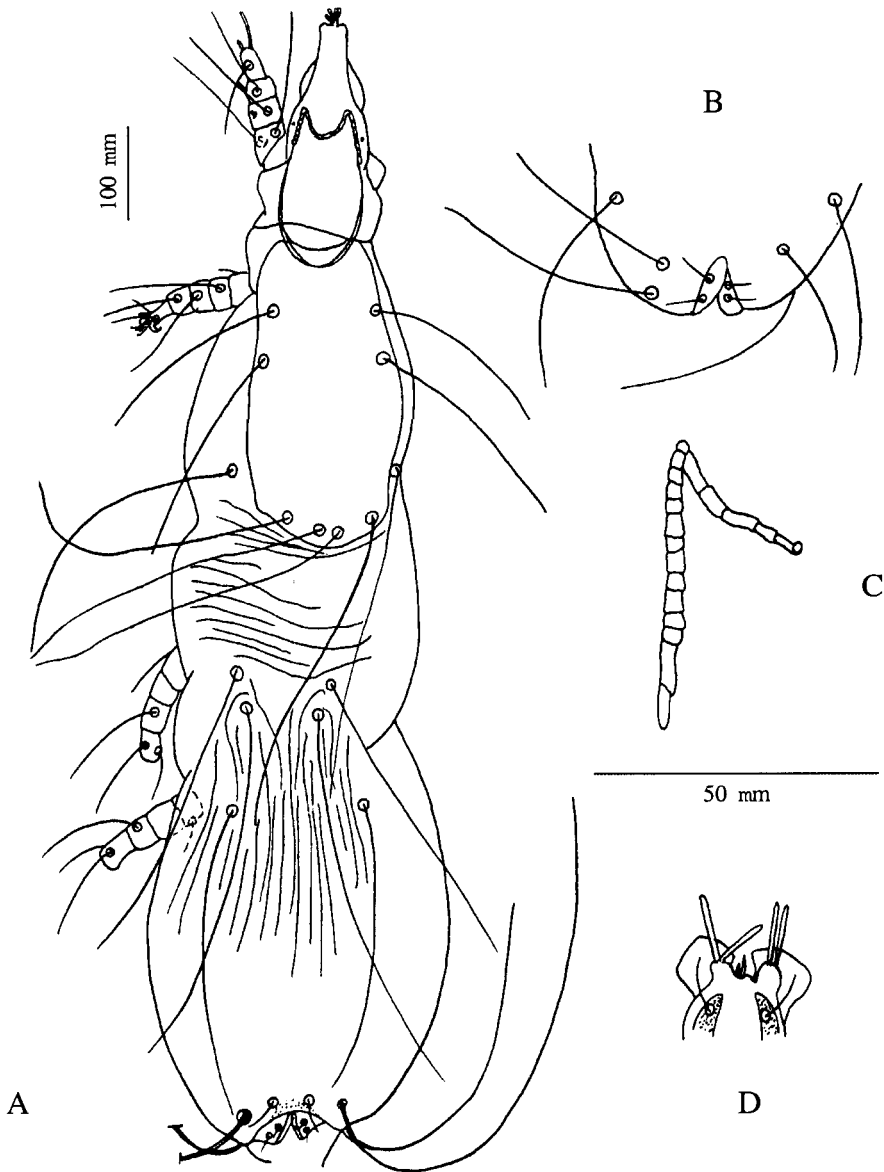


Fig. 5. *Terratosyringophilus loricinus* sp. n., female. A — dorsal view; B — opisthosoma, ventral view; C — peritreme; D — hypostomal apex, ventral view.

Remark. This species was known from *Columbina passerina* (Columbidae) from Texas [Casto, 1980] and it has not been recorded again. The hosts of this species belong to the two orders, Psittaciformes and Columbiformes. There are two genera, *Terratosyringophilus* and *Castosyringophilus*, species of which are associated with parrots and columbiform birds. However, it is a first fact for the syringophilids where one species parasitizes host species of these two orders.

Genus *Psittaciphilus*

Fain, Bochkov et Mironov, 2000

This genus includes five species infesting the parrot genus *Amazona* [Fain et al., 2000].

Psittaciphilus amazonae

Fain, Bochkov et Mironov, 2000

Material examined. 5 females and 5 males from *Amazona aestiva*, Brazil. It is collected from this host for the first time.

Remark. This species was described from *Amazona amazonica* from Colombia [Fain et al., 2000].

It is probably a specific parasite of the genus *Amazona*.

DISCUSSION

At present nineteen species and six genera of syringophilid mites are known from parrots. Three genera, *Megasyringophilus*, *Neoaulobia* and *Psittaciphilus*, are associated exclusively with Psittaciformes, whilst two genera, *Castosyringophilus* and *Terratosyringophilus* are also known from Columbiformes. The mites of the genus *Picobia* infest birds of the five orders, namely Passeriformes, Piciformes, Galliformes, Columbiformes and Psittaciformes. Moreover, the genus *Peristerophila* infesting pigeons is closely related to syringophilids from the true «parrot» genera [Bochkov, Perez, 2002]. The morphological similarity of syringophilid mites from Psittaciformes and Columbiformes could be explained by the hypothesis of close phylogenetic relationships between parrots and columbiform birds proposed by some experts [Carroll, 1993]. The majority of recognized syringophilid species from parrots are associated with non-Australian hosts and only one, *M. platycercus* sp. n., is described from an Australian parrot, *Platycercus eximius*. Meantime it is well known that Australia is a place of the parrot originating, and the most archaic recent forms of parrots inhabit this region. Therefore we can predict that new genera and numerous species, which will be very important for understanding the phylogenetic relationships among these mites, will be described from this area in the future.

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