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NEW FEATHER MITES OF THE FAMILY ASCOURACARIDAE
(ASTIGMATA: PTEROLICHOIDEA) FROM SOME PARROTS AND NIGHTJARS

by Serge V. MIRONOV¹ and Alex FAIN²

(Accepted April 2002)

ACARI
ASCOURACARIDAE
PARASITES
BIRDS

SUMMARY: Four new species of the quill-inhabiting feather mites of the family
Ascouracaridae are described: Ascouracarus chordeili sp. nov. from Chordeiles r. rupestris (Caprimulgidae);
Cystoidosoma aratingae sp. nov. from Aratinga jandaya (Psittacidae), C. myiopsittae sp. nov. from Myiopsitta monachus (Psittacidae),
Vassilevascus trapezoides sp. nov. from Trichoglossus haematodus forsteini (Loridae). A brief review of reference data and list of species described up to
date are given.

RÉSUMÉ : Quatre nouvelles espèces d’acariens plumicoles de la famille Ascoura-
caridae, vivant dans les remiges de divers oiseaux, sont décrites : Ascouracarus
chordeili sp. nov. de Chordeiles r. rupestris (Caprimulgidae); Cystoidosoma ara-
tingae sp. nov. de Aratinga jandaya (Psittacidae), C. myiopsittae sp. nov. de
Myiopsitta monachus (Psittacidae), Vassilevascus trapezoides sp. nov. de Tricho-
glossus haematodus forsteini (Loridae). Un bref rappel de la composition de la
famille Ascouracaridae et une liste des espèces décrites jusqu’ici dans cette
famille sont donnés.

INTRODUCTION

The feather mite family Ascouracaridae represents
one of six feather mite families, representatives of
which live inside quills of birds. This family was
originally established as a subfamily Ascouracarinae
within the family Syringobiidae (GAUD and ATYEO,
1976) and included six genera: Ascogastra GAUD et
ATYEO, 1976, Ascouracarus GAUD et ATYEO, 1976,
Cystoidosoma GAUD et ATYEO, 1976, Orphanacar-
carus GAUD et ATYEO, 1976, Petersonacarus GAUD et
D’SOUZA and JOGANNATH (1982) described one more
genius, Gallilichus D’SOUZA et JOGANNATH, 1982.
DABERT and EHRSBERGER (1992) have elevated this
suprageneric taxon to the family rank, partly revised
its genera and described a number of new species.
Besides, the genus Pyonacarus was synonymised to
Orphanacarus. Finally, DABERT and EHRSBERGER
(1995) have described one more genus, Vassilevascus

The members of the family are associated mainly
with terrestrial non-passeriform birds (Table), about
one third of them occurs on Psittaciformes, and only
one species is known from the corvid birds (Passeri-
formes). It is obvious that the taxonomic and biodi-

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versity study of this family is in a beginning stage only. As far the representatives of some genera are recorded from rather different orders of host, it is quite possible that future studies and accumulation of new data on biodiversity and morphological variability of these mites will show that some recently recognised genera are a complex.

Up to date, the family has included 24 species arranged into 7 genera. The present paper gives the descriptions of four new ascouracarid species found among 15 different orders of host, it is recorded from rather different areas.

**Material and methods**

The material used in the present study was collected by the junior author from birds which died in the Zoo of Antwerp. The birds and the mites were deposited in the Institut royal des Sciences Naturelles de Belgique. One species was collected from a bird received from Mr. M. Marlier (Amazonas). The parasites were preserved in 70% ethanol and for light microscope study mounted on slides in the Hoyer’s medium. The formats and terms of descriptions follow recent standards used for respective genera of the family Ascouracaridae (GAUD and ATYEO, 1976; DABERT and EHRLNSBERGER, 1992, GAUD and ATYEO, 1996), the idiosomal chaetotaxy is that of GRIFFITHS et al. (1990). All measurements are given in micrometers (µm). All type material is deposited in Institut royal des Sciences Naturelles de Belgique (Bruxelles, Belgique).

**Family** *Ascouracaridae* GAUD et ATYEO, 1976

**Genus** *Vassilevascus* DABERT et EHRLNSBERGER, 1995

This genus was based on a single species, *Vassilevascus trichosus* DABERT et EHRLNSBERGER, 1995 from the Rainbow lory *Trichoglossus haematodus cyanomammus* from New Guinea. That material was represented by one male, which was erroneously identified by TRUSSART (1898) as *Dermoglyphus (Sphaerogastra) monstruosus* TRUSSART, 1898.

**Vassilevascus trapezoides** MIRONOV et FAIN n. sp. nov. (Fig. 1-7)

**Male** (holotype). Length of idiosoma 975, width of hysterosoma (at widest part, posterior to legs IV) 595. Subcapitulum, including palpae, 197 × 215. Prodorsal shield 275 in length, 428 in width at posterior part. Distance between scapular setae: se-se 250, si-si 98. Setae c1 and d1 long, arranged in form of inverted trapezium, setae d1 equidistant from levels of setae c1 and d2. (Fig. 1). Setae e1 slightly closer to level of setae e2 than d2. Bases of setae h1 more distant than bases of setae h2, separated by 270. Bases of setae ps1 separated by 50, surrounded by small sclerotised dotted area. All dorsal idiosomal setae very long, exceeding 200. Length of setae: vi 125, se 495, si 395, c1 380, e2 340, c3 160, cp 360, d1 410, d2 365, e1 380, e2 335, f2 370, h1 230, h2 480, h3 440, ps1 270, ps2 175, ps3 90. Each coxal field I with two narrow incisions along epimerites I and II (Fig. 2). Genital apparatus at level of trochanters III, 70 × 50. Coxal setae 3a anterior to genital apparatus level of subhumeral setae c3; genital setae g at level of genital apparatus apex. Genital acetabulae situated posterior to setae g. Anal opening subterminal, rudimentary adanal setae absent.

**Female** (paratype). Length of idiosoma 1105, width of hysterosoma 655. Subcapitulum 185 × 218. Prodorsal shield 286 in length, 435 in width. Distance between scapular setae: se-se 265, si-si 98. Setae c1 and d1 long, arranged in form of inverted trapezium, setae d1 slightly closer to setae c1 than to d2. Setae e1 slightly closer to level of setae e2 than d2. Bases of setae h1 more distant than bases of setae h2, separated by 210. Bases of setae ps1 situated closely to one another, separated by 58 (Fig. 3). External copulatory tube terminal, as narrow cone about 6 in length, surrounded by small dotted area. All dorsal idiosomal setae very long, exceeding 250. Length of setae: vi 110, se 460, si 445, c1 320, e2 385, c3 170, cp 385, d1 355, d2 430, e1 355, e2 365, f2 360, h1 290, h2 505, h3 495, ps1 260, ps2 160, ps3 80. Coxal fields I with one narrow incision along epimerites I. Coxal setae 3a at level of anterior end of egg opening. Genital setae g anterior to acetabulae. Anal opening subterminal.
Cupules *ih* ventral. Two pairs of rudimentary anal setae, anterior and posterior to setae *ps3*. (Fig. 4). Secondary spermaducts stick-like, thin, 13-14 in length, distal ends with numerous short spines (Fig 5).

**Larva** (paratype). Idiosoma length 510, width 215. Subcapitulum rectangular, 95 × 82. Prodorsal shield almost rectangular, with rounded posterior angles, 142 in length, 90 in width; distance between scapular setae: *se-se* 120, *si-si* 75. Opisthosomal shield 160 × 120, with bluntly rounded anterior margin extending to the level of trochanters III. Setae *c1* and *d1* represented by macrochaetae with very thick basal half; setae *c1* situated at level of setae *c2*, setae *d1* on small cordiform sclerite slightly posterior to levels of setae *c1* and *c2*; setae *d2* at medium level of humeral shields, setae *e1* on opisthosomal shield, near to its anterior margin, setae *e2* at level of openings *gl*. Length of idiosomal setae: *vi* 12, *se* 680, *si* 320, *c1* 355, *c2* 345, *c3* 440, *cp* 690, *d1* 365, *d2* (broken), *e1* 190, *e2* 290, *h1* 150, *h2* 790.
**Differential diagnosis:** Formerly known species *Vassilevascus trichosus* DABERT et EHRNSBERGER, 1995 was based on one male only. The male of *Vassilevascus trapezoides* differs from that species by having setae *c1* and *d1* arranged into inverted trapezium (Fig. 1), setae *h1* widely separated from one another, and long setae *f2* about 230 in length. In the holotype of *V. trichosus*, the setae *c1* and *d1* are arranged into a transversal row slightly posterior to cupules *ia*; setae *h1* are close to one another, separated by 40; setae *f2* are short, about 70. As far the disposition and length ratio of most dorsal setae in male and female of *V. trapezoides* are rather similar, it is reasonable to suggest that listed characters would allow to discriminate the females of *V. trapezoides* and *V. trichosus*. 

**Fig. 3-5:** *Vassilevascus trapezoides* sp.nov., female. 3 — dorsal view; 4 — ventral view; 5 — head of spermatheca. ps — primary spermaduct, sd — secondary spermaduct.
**Material** : Holotype male, paratypes: 1 female and 2 larvae from the Rainbow lory *Trichoglossus haematodus forsteni* (Psittaciformes: Loridae), Antwerp Zoo, 3 July 1969. Coll. A. Fain. The primary origin of this bird specimen is unknown, however this subspecies of the Rainbow lory is characteristic for Sumatra.

**Etymology** : The species epithet refers to the trapezoid arrangement of setae *c1* and *d1*.

**Genus Cystoidosoma Gaud et Atyeo, 1976**

The genus has formerly included four species recorded on Psittaciformes and Falconiformes (Gaud
Fig. 8-10: Cystoidosoma aratingae sp.nov., female. 8 — dorsal view; 9 — ventral view; 10 — head of spermatheca.
and Atyeo, 1976; Dabert and Ehrensberger, 1992) (Table).

**Cystoidosoma aratingae** Mironov et Fain sp. nov.  
(Fig. 8-12)

Female (holotype). Length of idiosoma 1430, width of hysterosoma 835. Subcapitulum 220 × 246. Prodorsal shield 335 in length, 513 in width with long well-developed bow-like fold at posterior margin, with weakly expressed little pits in central part of the shield. Distance between scapular setae: se-se 335, si-si 218. Humeral shields present, their dorsal ends not extending to setae c2. Setae c1 at level of cupules ia; setae d1 slightly posterior to setae d2 and cupules ia. Pairs of setae e1 and h1 not far from one another, approximately at level of setae f2. Distance between setae: h1-h1 165, ps1-ps1 265. Bases of setae h2, h3, ps1 without surrounding sclerotisation. External copulatory tube situated dorsally, at level of setae h3, as very little cone about 8 in length. Length of setae: vi 75, se 410, si 295, c1 180, c2 285, c3 135, cp 385, dl 45, d2 90, e1 75, e2 120, f2 70, h1 20, h2 450, h3 460, ps1 310, ps2 95, ps3 85. Coxal fields I, II completely sclerotised, with out striations and incisions; medial margins of coxal fields I separated by narrow gap posterior to the end of fused epim epitites I. Coxal setae 3a at level of anterior end of egg opening. Genital setae g at level of anterior margins of coxal fields III, anterior to genital acetabulae. Anal opening ventro-terminal, folds of opening weakly sclerotised. Cupules

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<td>Loridae</td>
<td>New Guinea</td>
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<tr>
<td><em>V. trapezoides</em> sp. nov.</td>
<td><em>T. haematodus forsteini</em></td>
<td>Loridae</td>
<td>Antwerp Zoo</td>
</tr>
</tbody>
</table>

Table. List of species and host-associations of the family Ascouracaridae.
les  ih dorsoterminal. One pair of rudimentary adanal setae anterior setae ps3 present. Secondary spermatoducts banana-like, 10 in length, with small bunch of spines on apex; primary spermaduct with transversal striation (Fig. 10).

**Larva** (paratype). Idiosoma length 495, width 130. Subcapitulum 85 × 45. Prodorsal shield almost rectangular, with posterior margin straight, posterior angles extending lateral, 145 in length, 85 in width; distance between scapular setae: se-se 75, si-si 68.
Dorsal setae \(c1, c2, d1, d2, e1,\) and \(e2\) hair-like, very short, disposed typically for the genus *Cystoidosoma*. Anterior hysteronotal shield triangular, \(128 \times 78\), extending slightly beyond level of setae \(d1\). Opisthosomal shield \(200 \times 68\), with narrowly-ovate anterior end extending to level of trochanters III (Fig. 11). Length of idiosomal setae: \(vi 10, se 220, si 20, c1 15, c2 25, c3 105, cp 280, dl 16, d2 22, e1 17, e2 22, h1 170, h2 470\). All setae of idiosoma smooth except macrochaetae \(h2\) having little nodules in enlarged basal half. Coxal fields I not fused posterior to tips of epimerites I, completely sclerotized, without incisions.

**Differential diagnosis**: The new species is the largest one in the genus *Cystoidosoma* and belongs to the group of species characterised by the prodorsal shield with the bow-like fold on its posterior margin. The female of *Cystoidosoma aratingae* is most closely related to *C. psittacivora* DABERT et EHRSBERGER, 1992 and differs by the humeral shields not extending to setae \(c2\), coxal fields I separated from one another (Fig. 8, 9). In the female of *C. psittacivora*, the humeral shields extending to setae \(c2\), coxal fields I are fused by the median margins just posterior to the sternum. The larva of *C. aratingae* is distinguished from that of *C. psittacivora* and also *C. sacculipyga* DABERT et EHRSBERGER, 1992 by the longer anterior hysteronotal shield extending beyond the level of setae \(d1\) and completely sclerotised coxal fields I. In larvae of two latter species the anterior hysteronotal shield reaches only the level of setae \(d1\) and coxal fields I have a deep narrow incision.

**Material**: Holotype female, paratypes: 1 females, 4 larvae from the Jandaya conure *Aratinga jandaya* (Psittaciformes: Psittacidae), Antwerp Zoo (from Brasil), 5 March 1970. Coll. A. FAI\N.

**Etymology**: The species name derives from the generic name of host.

*Cystoidosoma myiopsittae* MIRONOV et FAI\N sp. nov.  
(Fig. 13-15)

**Female** (holotype). Length of idiosoma 1335, width of hysterosoma 740. Subcapitulatum \(175 \times 202\). Prodorsal shield 335 in length, 513 in width with long well-developed bow-like fold at posterior margin, with almost indistinct pits in central part of the shield. Distance between scapular setae: \(se-se 315, si-st 205\). Humeral shields present, dorsal ends not extending to setae \(c2\). Setae \(c1\) at level of cupules \(ia\), setae \(d1\) posterior to setae \(d2\). Pairs of setae \(e1\) and \(h1\) not far from one another, approximately at level of setae \(f2\). Distance between setae \(h1-h1 145, ps1-ps1 140\). Bases of setae \(h2, h3, ps1\) situated on narrow sclerotised band. External copulatory tube terminal, as very short, thin cone about \(9\) in length, surrounded by little sclerotised area. Length of setae: \(vi 35, se 385, si 160, c1 (broken), c2 80, c3 65, cp 275, dl 35, d2 60, e1 40, e2 95, f2 65, h1 9, h2 335, h3 275, ps1 235, ps2 60, ps3 35\). Coxal fields I, II completely sclerotised, with fine striations on medial ends; medial margins of coxal fields I separated by sternum of epimerites I. Coxal setae \(3a\) at level of anterior end of egg opening. Genital setae \(g\) at level of anterior margins of coxal fields III, anterior to genital acetabulae. Anal opening subterminal, folds of opening not sclerotised. Cupules \(ih\) ventral. One pair of rudimentary adanal setae anterior setae \(ps3\) present. Secondary spermatoducts as slightly curved tubes, \(12\) in length, with few obliterated apical teeth; primary spermatoduct with fine granular texture. (Fig. 15).

**Differential diagnosis**: The female of *Cystoidosoma myiopsittae* is similar to *C. aratingae* described above and distinguished by the following characters: coxal fields I are separated by short sternum; bases of setae \(h2, h3\) and \(ps1\) are situated on weakly sclerotised band; setae \(si\) are relatively short, counting less than half of setae \(se\) (Fig. 13, 14). In the females of *C. aratingae* the coxal fields I are separated by the narrow gap, sclerotisation around setae \(h2, h3\) and \(ps3\) is absent, and setae \(si\) are about \(3/5\) of setae \(se\) (Fig. 9, 10). All these characters also separate the new species from *C. labidostoma* and *C. psittacivora*.


**Etymology**: The species name derives from the generic name of host.
Fig. 13-15: *Cystoidosoma myopsittae* sp.nov., female. 13 — dorsal view; 14 — ventral view; 15 — head of spermatheca.
Genus *Ascouracarus* Gaud et Kolebinova, 1973

The genus has included 3 species, two of which were described from the nightjars Caprimulgiformes and one from parrots Psittaciformes (Gaud and Kolebinova, 1973; Gaud and Atyeo, 1976; Dabert and Ehrnsberger, 1992).

**Ascouracarus chordeili** Mironov et Fain sp. nov. (Fig. 16-20)

Male (holotype). Length of idiosoma 805, width of hysterosoma 440. Subcapitulum, including palpae, 106 × 155. Prodorsal shield 220 in length, 330 in width, with lateral incision reaching bases of setae se...
with several transversal crests or folds between scapular setae. Distance between scapular setae: se-se 225, si-si 145. Humeral shields represented by ovate shields at level of setae c2 and very small transversal sclerites slightly posterior to level of cupules ia. Setae c1 at level of cupules ia; setae d1 posterior to setae d2; setae e1 closer to gland openings gl than to setae e2; setae h1 at level of cupules ip. Distance between setae: h1-h1 102, ps1-ps1 116. Posterior end of opisthosoma with pair of transversal irregular sclerites encompassing bases of setae h3 and ps1. (Fig. 16). Length of idiosomal setae: vi 95, se 275, si 180, c1 65, c2 60, c3 135, cp 305, d1 30, d2 80, e1 40, e2 105, f2 110, h1 7, h2 310, h3 355, ps1 320, ps2 95, ps3 17. Coxal fields I not fused, with very deep narrow incisions along epimerites II almost reaching lateral margin of body. Geni-
tal apparatus at level of trochanters III, 54 × 42. Coxal setae 3a anterior to genital apparatus, at level of anterior margin of coxal fields III, setae g at level of genital apparatus apex. Genital acatabulae situated posterior to setae g. Anal opening ventral, cupules ih ventral, rudimentary adanal setae absent.

female (paratype). Length of idiosoma 895, width of hysterosoma 436. Subcapitulum 135 × 162. Pro- dorsal shield 225 in length, 345 in width. Distance between scapular setae: se-se 320, si-si 155. Humeral shields as in the male. Setae c1 at level of cupules ia, setae dl slightly posterior to setae d2, setae el posterior to gland openings gl. Distance between setae: h1-h1 120, ps1-ps1 155. Posterior end of opisthosoma with pair of transversal irregular sclerites touching bases of setae h2, h3 and ps1. External copulatory tube dorsal, as little cone about 8 in length, with rounded apex. Length of setae: vi 75, se 320, si 155, c1 50, c2 65, c3 160, cp 305, d1 30, d2 85, e1 45, e2 110, f2 120, h1 5, h2 280, h3 325, ps1 335, ps2 1-5, ps3 20. Coxal fields I not fused, with very deep narrow incisions along epimerites II almost reaching lateral margin of body. Coxal setae 3a at level of anterior one third of egg opening. Genital setae g at level of anterior pair of acatabulae. Anal opening ventral. Cupules ih ventral. One pair of rudimentary adanal setae posterior to setae ps3 present. Secondary spermaducts as slightly curved tubes about 7 in length, with numerous small spines in distal half (Fig. 20).

Differential diagnosis: The new species is most similar to Ascouracarus kosarovi (Vassilev, 1959) and A. michiganii Dabert et Ehrnsberger, 1992 living on nightjars of the genus Caprimulgus. Both males and females of the new species differ from these species by having a pair of opisthosomal sclerites at bases of seta row h2, h3, ps1, and the setae dl situated posterior setae d2. (Fig. 16, 18). In two named species of Ascouracarus the opisthosomal sclerites are absent and the setae dl situated anterior to the level of setae d2.


Etymology: The species name derives from the generic name of host.

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