



Revision of the subfamily Onychalginae Fain, 1988 (Acariformes: Pyroglyphidae)—ectoparasites of passerine birds

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Abstract

The subfamily Onychalginae Fain, 1988 (Acariformes: Pyroglyphidae) is a monophyletic lineage comprising the closest parasitic relatives of the free-living pyroglyphid house dust mites. Onychalgine mites parasitize passerine birds of the families Estrildidae, Passeridae, and Ploceidae in Africa and South America (a single record of *Onychalges spinitarsis* from a piciform bird requires confirmation). We revise this subfamily based on external morphology of adults and immature stages using light and scanning electron microscopy and give a key to species. Onychalginae includes 2 genera: *Onychalges* Gaud and Mouchet, 1959 (6 species) and *Paramealia* Gaud, 1968 (1 species). The genus *Kivuicola* Fain, 1971 **syn. nov.** is synonymized with *Onychalges*, and its single species *K. kivuana* Fain, 1971 **syn. nov.** is considered as a putative synonym of *O. odonturus* Gaud, 1968. *Onychalges spinitarsis* (Fain and Gaud, 1984) is considered as a *species inquirenda*.

Key words: Acari, ectoparasites, external morphology, passerine birds, systematics

Introduction

According to the classical taxonomic concept by Fain (1988), the family Pyroglyphidae (Acariformes: Psoroptidia) includes five subfamilies. Three are nidicolous—Pyroglyphinae, Dermatophagoidinae, Guatemalichinae—and two are parasitic—Onychalginae and Paralogsinae. Recent molecular and morphological phylogenetic evidence suggest that the quill mite subfamily Paralogsinae is unrelated to Pyroglyphidae and represents a separate lineage (Klimov & OConnor 2008, 2013; Bochkov & Mironov 2011). Thus, Onychalginae is the only parasitic group among pyroglyphids.

Pyroglyphids certainly need a taxonomic revision. The diagnoses of the pyroglyphid subfamilies provided by Fain (1988) are very short and sometimes not consistent. The monophyly of currently recognized subfamilies and some genera is questionable. Onychalginae are especially poorly studied. Almost all species of this subfamily were described only briefly (Gaud 1968; Fain & Rosa 1982; Fain & Gaud 1984). Similarly, phylogenetic relationships of onychalgines with respect to other pyroglyphids are not enough clear. Different molecular analyses (e. g., based on amino acid or DNA sequences) place them as within or outside of the free-living pyroglyphids, but, regardless, onychalgines appear to be the closest parasitic relatives of nidicolous pyroglyphids (Klimov & OConnor 2013). Phylogenetic position of Onychalginae is thus very interesting because it may shed light on the transition between parasitic and free-living states in pyroglyphids as hypothesized by Klimov and OConnor (2008, 2013).

The present work is the first step towards a complete taxonomic revision of this family. In this paper, we study external morphology of onychalgines, including all postembryonic stages, using light and scanning electron microscopy, conduct a comprehensive revision, and give a key to all species.

- sIII and wIII with single-pointed apices
 (*Paramealia* Gaud and Mouchet, 1959) ... *P. ovata* (Gaud and Mouchet, 1959) (Figs. 17, 19A–D, 20)
2. Dorsal striae fine. Body, including gnathosoma, less than 550 long 3
 - Dorsal striae distinctly thickened (Figs. 1A). Body, including gnathosoma, 600–630 long.
 *Onychalges longitarsus* (Bonnet, 1924) (Figs. 1, 16C–E, 20)
3. Opisthosomal lobes without apical membrane. Posterior pair of genital papillae situated distinctly outside anterior pair. Sheath of aedeagus present, aedeagus longer than 10 4
 - Opisthosomal lobes with apical membrane (Fig. 12C, D). Anterior and posterior pairs of genital papillae situated almost at same longitudinal level. Sheath of aedeagus absent, aedeagus shorter than 8
 *Onychalges odonturus* Gaud, 1968 (Figs. 12, 13, 20)
4. Setae *4b* at least twice longer than *4a*. Opisthosomal lobes moderately developed, terminal cleft 30–40 long. Setae *ps1* 180–240 long, 1–1.2 times shorter than *ps2* 5
 - Setae *4b* slightly shorter than *4a*. Opisthosomal lobes weakly developed, terminal cleft about 20 long. Setae *ps1* 115–130 long, 1.5–1.7 times shorter than *ps2* *Onychalges asaphospathus* Gaud, 1968 (Figs. 10, 16A, B, 20)
5. Body, including gnathosoma, 480–500 long. Aedeagus not reaching level of seta *g* bases, 16–20 long
 *Onychalges schizurus* Gaud, 1968 (Figs. 14, 20)
 - Body, including gnathosoma, 390–420 long. Aedeagus reaching level of seta *g* bases, 35–40 long.
 *Onychalges pachyspathus* Gaud, 1968 (Figs. 3, 5C–F, 6, 20)

Females

1. Central sclerite of ambulacral disc with distinctly developed anterior part. Scapular shields present. Genital papillae located outside of epigynum. Primary spermaduct smooth. Setae *sIII* and *wIV* trifurcate ... *Onychalges* Gaud and Mouchet, 1959...2
 - Central sclerite of ambulacral disc with strongly reduced anterior part. Scapular shields absent. Genital papillae located inside of epigynum. Primary spermaduct corrugated. Setae *sIII* and *wIV* with pointed apices
 *Paramealia* Gaud and Mouchet, 1959, *P. ovata* (Gaud and Mouchet, 1959) (Figs. 18, 19E, F, 7–20)
2. Dorsal striae fine. Bursa copulatrix globular (Fig. 20) 3
 - Dorsal striae distinctly thickened (Figs. 2A). Bursa copulatrix strongly elongated, 7–8 times longer than wide (Fig. 20).
 *Onychalges longitarsus* (Bonnet, 1924) (Figs. 2, 16G, F, 20).
3. Hysteronotal shield or its remnants present 4
 - Hysteronotal shield absent 5
4. Body, including gnathosoma, 430–450 long. Hysteronotal shield distinct, with subparallel lateral margins. Setae *3a* about 2 times longer than *4b* *Onychalges odonturus* Gaud, 1968 (Figs. 12, 13, 20)
 - Body, including gnathosoma, 390–410 long. Hysteronotal shield strongly reduced, roughly triangular. Setae *3a* and *4b* subequal *Onychalges schizurus* Gaud, 1968 (Figs. 15, 20)
5. Body, including gnathosoma, 380–390 long. Setae *c3* 75–85, about 1.7 times longer than *3a*, 45–50 6
 - Body, including gnathosoma, 440–460 long. Setae *c3* 45–50, slightly shorter than *3a*, 65–70
 *Onychalges asaphospathus* Gaud, 1968 (Figs. 11, 20)
6. Setae *d2* and *e2* about 30 long, *f2* 18 long *Onychalges nidicola* Fain and Rosa, 1982
 - Setae *d2* and *e2* 60–80 long, *f2* 35–40 long *Onychalges pachyspathus* Gaud, 1968 (Figs. 4, 5A, B, 20)

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