A NEW SPECIES OF PARASITIC MITES OF THE GENUS *SYRINGOPHILOIDUS* KETHLEY 1970 (ACARI: SYRINGOPHILIDAE) FROM THE BARN SWALLOW *HIRUNDO RUSTICA* LINNAEUS, 1758

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Summary:

A new quill mite species *Syringophiloidus hirundinis* (Acari: Syringophilidae) is described from the Barn Swallow *Hirundo rustica*. The species *Syringophiloidus hirundinis* had a prevalence of 17.1 % in the two outermost tail feathers (N = 208 adult Barn Swallows) during the breeding season of the Barn Swallow host. Intensity of infestation was 9.7 adult mites per pair of infested tail feathers. The sex ratio was highly biased towards females, with only 7.5 % of all individuals being males (20/3).

KEY WORDS: Acari, Syringophilidae, ectoparasites, quill mites, Barn Swallow, *Hirundo rustica*, *Syringophiloidus hirundinis* sp. n.

Résumé : UNE NOUVELLE ESPÈCE D'ACARIEN DU GENRE *SYRINGOPHILOIDUS* KETHLEY 1970 (ACARI : SYRINGOPHILIDAE) PARASITE DE L'HIRONDELLE *HIRUNDO RUSTICA* LINNAEUS, 1758

Une nouvelle espèce d'acarien parasite *Syringophiloidus hirundinis* (Acari : Syringophilidae) est décrite au niveau du plumage de l'hirondelle *Hirundo rustica*. Cette nouvelle espèce est observée avec une prévalence de 17,1 % au niveau des plumes des deux pointes de la queue (N = 208 hirondelles adultes) pendant la saison de reproduction de l'oiseau. L'intensité de l'infestation est de 9,7 acariens adultes par plumes de queue. Le sex ratio est biaisé en faveur des femelles car 7,5 % seulement des oiseaux étaient des mâles (20/3).

MOTS CLÉS : Acari, Syringophilidae, ectoparasite, plumage, hirondelle, *Hirundo rustica*, *Syringophiloidus hirundinis* sp. n.

INTRODUCTION

The fauna of Syringophilidae mites is insufficiently investigated. To date, the genus *Syringophiloidus* includes 10 described species from two orders of avian hosts: Passeriformes and Apodiformes (Kethley, 1970; Chirov & Kravtsova, 1995; Bochkov & Mironov, 1998; Fain *et al.*, 2000; Bochkov, 2001; Skoracki *et al.*, 2001).

In the present paper we describe a new species of the genus *Syringophiloidus* associated with the Barn Swallow *Hirundo rustica* (Aves: Hirundinidae). The biology and ecology, including parasites, of the Barn Swallow are well known (Møller, 1994). Several species of parasites have been documented, including mites on feathers and in nests (summary in Møller, 1994).

The nomenclature of idiosomal setae is based on Fain (1979) in the version modified for the family Syringophilidae (Bochkov & Mironov, 1998; Bochkov *et al.*,

1999). The terminology for morphology and leg chaetotaxy follows that of Kethley (1970). All measurements, including scale bars in figures, are given in micrometers (µm). The setal measurements of the holotype are incomplete, because some setae are broken; however ranges of setal lengths are given for 10 paratypes. Abbreviations for locations where the type materials are deposited:

UAM – Department of Animal Morphology, A. Mickiewicz University, Poznań, Poland;

ZIN – Zoological Institute, St. Petersburg, Russia.

DESCRIPTION

SYRINGOPHILOIDUS HIRUNDINIS SP. N.

- Female (Figs. 1, 2 and 5, 6)

Total length of holotype 800 (790-850 in 10 paratypes). Gnathosoma. Gnathosoma punctuated ventrally. Hypostomal apex as in Figure 5. Stylophore 180 (170-185) long, rounded posteriorly. Peritremes M-shaped; each transverse branch with two-three chambers, each longitudinal branch with seven-nine chambers (Fig. 6). Idiosoma. Cuticular striations as in Figures 1, 2. Prodorsal plate poorly developed, margins indistinct, punctated. Setae *vi* and *ve* slightly serrate, other idiosomal setae smooth. Hysterosomal plate poorly developed or absent. Pygidial plate present without punc-

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Figs 1, 2. – *Syringophiloidus birundinis* sp. n. Female. 1. Dorsal view. 2. Ventral view.

tations. Setae *d2* closer to *l1* than to *l2*. Two pairs of anal setae present.

Legs. Coxae I and II punctated, coxae III and IV weakly developed, few or no punctations. Length of setae: *sc1* 10 (10-15); *sc2* 15 (15-25); *sc3* 50 (40-55); *sc4* 40 (40-50). Setae *p'* and *p''* of legs III and IV with 7-10 tines. Length of setae *tc'* of tarsi III and IV (60-65), *tc''* of tarsi III and IV (85-95).

Lengths of setae: *vi* 105 (90-110); *ve* 195 (180-220); *sci* 255 (240-260); *h* (295-315); *d1* 295 (285-300); *sce* 295 (290-320); *l1* 265 (215-250); *d2* (235-275); *l2* 200 (230-240); *l4* 355 (330-380); *d4* 40 (40-45); *l4* 400 (385-450);

d5 (40-45); *ic1* (160-165); *ic3* 140 (100-135); *g1* and *g2* subequal 40 (40-50); *a1* and *a2* subequal (50-55); *pg1* 200 (150-200); *pg2* (175-210); *pg3* 225 (220-245).

• Male (Figs 3, 4 and 7, 8)

Total length 525-545 in three paratypes.

Gnathosoma. Gnathosoma punctated ventrally. Hypostomal apex as in Figure 7. Stylophore 145-155 long, weakly constricted posteriorly. Peritremes M-shaped; each transverse branch with two-three chambers, each longitudinal branch with six-seven chambers (Fig. 8). Idiosoma. Cuticular striations as in Figures 3, 4. All dorsal plates (propodosomal, hysterosomal and pygi-

Figs 3, 4. – *Syringophiloidus hirundinis* sp. n. Male. 3. Dorsal view. 4. Ventral view.

Figs 5, 6. – *Syringophiloidus hirundinis* sp. n. Female. 5. Hypostomal apex ventral view. 6. Peritremes.

Figs 7, 8. – *Syringophiloidus hirundinis* sp. n. Male. 7. Hypostomal apex ventral view. 8. Peritremes.

dial) poorly developed, margins indistinct. Length of setae: *vi* 50-65; *ve* 100; *d1* 195; *sce* 165-185. Propodosomal setae smooth. Setae *d2* closer to *l1* than to *l2*. Legs. Coxae I-IV with few or no punctations. Length of setae: *sc1* 10; *sc2* 15; *sc3* 25-35; *sc4* 20-25. Setae *p'* and *p''* of legs III and IV with 7-10 tines. Length of setae *tc'* of tarsi III and IV 35-40; *tc''* of tarsi III and IV 60-65.

Lengths of setae: *vi* 100-130; *ve* 170-175; *sci* variable 50-60 or 160; *b* 175-200; *d1* 230; *sce* 220-255; *l1* variable 45-55 or 90-95; *d2* 30-40; *l2* 20-30; *d5* 40-60; *l5* 275-285; *ic1* 130-135; *ic3* 90-100; *pg1* 135-150; *pg2* 95-120. Distances between setal bases: *l1-d2* 35-40; *d2-l2* 50.

• Type material

Female holotype (S-40.1.1), 19 female, three male, 11 nymph and four larvae paratypes from Barn Swallow *Hirundo rustica* (Passeriformes: Hirundinidae); Milano, Italy; 17 June 1993; leg. A. Möller, det. M. Skoracki. Holotype, 17 female, two male, 11 nymph and four larvae paratypes are deposited at UAM; two female and one male paratypes are deposited at ZIN.

• Etymology

The name refers to the generic name of the host.

- Differential diagnosis

Syringophiloidus birundinis sp. n. is closely related to *S. cypsiuri* Fain, Bochkov & Mironov, 2000 described from *Cypsiurus parvus* (Apodiformes: Apodidae) from the Congo (Africa). In both species the propodosomal setae are smooth, setae *vi* longer than 70, *ve* longer than 150. This new species is distinguishable from above mentioned species by the presence of the following characters. In the female *S. birundinis* sp. n., lengths of setae: *l4* 315-350; *l5* 405-450; *pg2* 170-210; *a* 50-55; *tc'* III and IV 60-65. In the male, lengths of setae *vi* and *l5*: 170-175 and 275-285 respectively; length of setae *l1* longer than *l2*. In the female *S. cypsiuri*, lengths of setae: *l4* 220; *l5* 275; *pg2* 110-115; *a* 30; *tc'* III and IV 40-45. In the male, lengths of setae *vi* and *l5*: 110 and 180 respectively; setae *l1* and *l2* subequal.

- Ecological comments

Quill mites live within the calamus of bird feathers. The mites enter through the superior umbilicus of the feather during the growth of feathers of nestlings or during moult. Only adult female mites disperse (Kethley, 1971). Transmission is vertical from parent hosts to their offspring during reproduction and horizontal from one adult host individual to another during moult. Since Barn Swallows are highly gregarious during the winter, when the single annual moult takes place (Turner & Rose, 1989), frequent contact between individuals during communal roosting should facilitate horizontal transmission. Quill mites of the species *Syringophiloidus birundinis* had a prevalence of 17.1 % in the two outermost tail feathers (N = 208 adult the Barn Swallows) during the breeding season of the Barn Swallow host. The outermost tail feathers were collected from all individual barn swallows captured during extensive studies of reproductive biology and behaviour of the species. The material is presented in Möller *et al.* (1995). Intensity of infestation was 9.7 adult (SE = 2.2) mites per pair of outermost tail feathers among infested individuals. The sex ratio was highly biased towards females, with only 7.5 % of all individuals being males. This pattern is common among quill mites (e.g. Kethley, 1971; Casto, 1975). The optimal sex ratio will depend on the frequency of multiple infestations (Hamilton, 1967, 1979). The frequency of multiple infestations in the barn swallow remains to be determined, although frequently recorded dead female quill mites in other hosts (e.g. Casto, 1975) could be interpreted as arising from interactions between multiple founding females and corresponding with their lower fitness advantage than during solitary infestation (Kethley, 1975).

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