A NEW GENUS AND FOUR NEW SPECIES OF QUILL MITES (ACARI: PROSTIGMATA: SYRINGOPHILIDAE) FROM PHASIANID BIRDS (GALLIFORMES: PHASIANIDAE)

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Summary:

A new genus and four new species of the quill mites are described. *Galliphilopsis* gen. n. (*G. francolinus* sp. n., type species) differs from the closely related *Dissonus* Skoracki, 1999 by loss of leg setae dGII, the slightly divergent tips of epimeres I and the stylophore constricted posteriorly. Three new species of the genus *Galliphilopsis* gen. n. and one new species of the genus *Mironovia* Chirov and Kravtsova, 1995 are described from galliform birds (Phasianidae) collected at the Museum of Natural History, Wrocław University (Poland): *G. lophurus* sp. n. from *Lophura leucomelanos*, *G. bochkovi* sp. n. from *Tragopan* sp. and *Alectoris barbara*, *G. francolinus* sp. n. from *Francolinus levalliantoides*, and *Mironovia rouloul* sp. n. from *Rollulus rouloul*.

KEY WORDS : Syringophilidae, quill mites, taxonomy, Galliformes, ectoparasites.

Résumé : UN NOUVEAU GENRE ET QUATRE ESPÈCES NOUVELLES D'ACARIENS PLUMICOLES (ACARI : PROSTIGMATA : SYRINGOPHILIDAE) D'OISEAUX GALLIFORMES (GALLIFORMES : PHASIANIDAE)

Un nouveau genre et quatre nouvelles espèces d'acariens plumicoles sont décrits. *Galliphilopsis* gen. n. (*G. francolinus* sp. n., espèce type) diffère de *Dissonus* Skoracki, 1999, genre étroitement apparenté par l'absence des setae des pattes dGII, l'apex des épimères I légèrement divergent et le stylophore rétréci postérieurement. Trois nouvelles espèces du genre *Galliphilopsis* et une nouvelle espèce du genre *Mironovia* Chirov and Kravtsova, 1995 sont décrites chez des oiseaux galliformes (Phasianidae) de la collection du Muséum d'Histoire Naturelle de l'Université de Wrocław (Pologne) : *G. lophurus* sp. n. sur *Lophura leucomelanos*, *G. bochkovi* sp. n. sur *Tragopan* sp. et *Alectoris barbara*, *G. francolinus* sp. n. sur *Francolinus levalliantoides*, et *Mironovia rouloul* sp. n. sur *Rollulus rouloul*.

MOTS CLÉS : Syringophilidae, acarien plumicole, taxonomie, Galliformes, ectoparasites.

INTRODUCTION

Quill mites of the family Syringophilidae are ectoparasites of birds. They live and reproduce within the quill of various types of feathers (primaries, secondaries, tertials, etc.). Until now quill mites are known from 16 orders of host (Kethley, 1970; Casto, 1977; Philips & Norton 1978; Fain *et al.*, 2000; Skoracki & Dabert, 2001). Five genera of the subfamily Syringophilinae are associated with the order Galliformes: *Syringophilus* Heller, 1880 (two species), *Colinophilus* Kethley, 1973 (one species), *Kalamotrypetes* Casto, 1980 (two species), *Mironovia* Chirov and Kravtsova, 1995 (three species) and *Galliphilopsis* gen. n. (three species), and one genus of the subfamily Picobiinae, *Picobia* Haller, 1978 (two species) (Table I) (Casto, 1980; Kethley, 1970, 1973; Chirov & Kravtsova, 1995; Bochkov, 2000; Fain *et al.*, 2000; Skoracki *et al.*, 2001). All these genera, except *Picobia*, inhabit exclusively the galliform hosts. The widely distributed genus *Picobia* parasitize birds of the order Galliformes as well as the five other orders: Passeriformes, Piciformes,

Coraciiformes, Columbiformes, and Psittaciformes. The fauna of Syringophilidae from galliform birds is still poorly known. Among 218 species of this order (Zoo-nomen Nomenclatural data 2002) only 13 are known as hosts for quill mites and we suggest that there are still many not recognized species associated with galliform birds.

In the present paper we give a description of three new species of the new genus *Galliphilopsis* and one new species of the genus *Mironovia* Chirov and Kravtsova, 1995. All these mites were collected from galliform birds (Phasianidae): *G. lophurus* sp. n. from *Lophura leucomelanos*, *G. bochkovi* sp. n. from *Tragopan* sp. and *Alectoris barbara*, *G. francolinus* sp. n. from *Francolinus levalliantoides*, and *Mironovia rouloul* sp. n. from *Rollulus rouloul*.

MATERIAL AND METHODS

Syringophilid specimens were acquired from the bird collection kept at the Museum of Natural History, Wrocław University (Poland) (NMW). Coverts and body feathers were examined. Mites were mounted in lactic acid (10 %) within three days. After then, mites were mounted on microslides in a polyvinyl-

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Quill mite species	Host species	Host family
<i>Colinophilus wilsoni</i> Kethley, 1973	<i>Colinus virginianus</i>	Phasianidae
<i>Galliphilopsis francolinus</i> sp. n.	<i>Callipepla squamata</i>	Phasianidae
<i>G. bochkovi</i> sp. n.	<i>Francolinus levalliantoides</i>	Phasianidae
	<i>Tragopan</i> sp.	Phasianidae
<i>G. lophurus</i> sp. n.	<i>Alectoris barbara</i>	Phasianidae
<i>Kalamotrypetes colinastes</i> Casto, 1980	<i>Lophura leucomelanos</i>	Phasianidae
	<i>Colinus virginianus</i>	Phasianidae
<i>K. pavodaptes</i> Casto, 1980	<i>Callipepla squamata</i>	Phasianidae
<i>Mironovia phasiani</i> Chirov and Kravtsova, 1995	<i>Meleagris gallopavo</i>	Meleagrididae
<i>M. coturnae</i> Bochkov <i>et al.</i> , 2004	<i>Phasianus colchicus</i>	Phasianidae
<i>M. rouloul</i> sp. n.	<i>Coturnix coturnix</i>	Phasianidae
<i>Picobia alectori</i> Fain <i>et al.</i> , 2000	<i>Rollulus rouloul</i>	Phasianidae
<i>P. polonica</i> Skoracki <i>et al.</i> , 2001	<i>Alectoris</i> sp.	Phasianidae
<i>Syringophilus bipectinatus</i> Heller, 1880	<i>Gallus gallus</i>	Phasianidae
	<i>Gallus gallus</i>	Phasianidae
	<i>Alectoris rufa</i>	Phasianidae
	<i>Ptilopachus petrosus</i>	Phasianidae
<i>S. numidae</i> Bochkov, 2000	<i>Numida meleagris</i>	Numididae

Table I. – The quill mite species associated with galliform birds (Galliformes).

lactophenol medium and examined with the Nomarsky interference-contrast-phase with microscope Olympus BH2. The precise data on the localities for many investigated birds were unknown. The nomenclature of idiosomal setae follows Fain (1979) in the version adapted for the family Syringophilidae (Bochkov & Mironov, 1998) and the chaetotaxy for the legs is that of Grandjean (1944). Bird taxonomy follows that of Howard and Moore (1991). All measurements in descriptions are given in micrometers (µm). The setal measurements of the holotypes are incomplete, because some setae are broken. The holotypes and most of the paratypes are deposited at the Department of Animal Morphology, A. Mickiewicz University, Poznan, Poland (UAM). Some paratypes are deposited at the Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia (ZIN) and at the Smithsonian National Museum of Natural History (SNM).

RESULTS

Family Syringophilidae Lavoipierre, 1953.
Subfamily Syringophilinae Lavoipierre, 1953.

GENUS *GALLIPHILOPSIS* GEN. N.

Type species *Galliphilopsis francolinus* sp. n.

Host order: Galliformes.

• Description

Female. Small mites (total body length 400-550 µm). Hypostomal apex rounded without protuberances. Lateral hypostomal teeth absent. Cheliceral digit edentate. Peritremes M-shaped, longitudinal branches short with two-three chambers. Stylophore constricted posteriorly. All idiosomal setae smooth. Propodosomal

plate weakly sclerotized. Setal pattern of propodosomal region with five pairs of propodosomal setae present: *ve*, *sci*, *b*, *sce* and *d1* (*vi* – absent), arranged 1-1-1-2 (Fig. 1). Hysterosomal plate variable, weakly sclerotized or absent. Genital and anal series with two pairs of setae, respectively. Paragenital series with three pairs of setae. Epimeres I slightly divergent anteriorly, not fused to epimeres II. Leg setae smooth (except *p'* and *p''*-multiserrate), setae *dGII* and *dTIII-IV*, absent. Antaxial and paraxial members of claw pair subequal. Male unknown.

• Differential diagnosis

This new genus is closely related to the genus *Dissonus* Skoracki, 1999 associated with passeriform birds (Passeriformes) (Skoracki, 1999). In both genera setae *vi*, *dTIII* and *dTIV* are absent, setae *vs'II*, *sc1* and *sc2* are present. There are two pairs of anal setae. *Galliphilopsis* gen. n. is distinguished from *Dissonus* by absence of setae *dGII*, slightly divergent tips of epimeres I and constricted posteriorly stylophore. In *Dissonus* setae *dGII* are present, epimeres I are parallel and stylophore is rounded posteriorly.

• Etymology

This generic name is derived from the name “Galliformes” – the name of bird order hosting mites of this new genus.

GALLIPHILOPSIS FRANCOLINUS SP. N.

• Female (Figs 1-5)

Total body length of holotype 535 (500-550 in four paratypes).

Gnathosoma. Hypostomal apex as in Figure 3. Stylophore constricted posteriorly, 145 (145-150) long. Peritremes M-shaped, each transversal branch with one-

Figs 1-5. – *Galliphilopsis francolinus* sp. n. Female. 1. Dorsal view. 2. Ventral view. 3. Gnathosoma in ventral view. 4. Peritremes. 5. Fan seta *p'III*.

two chambers, each longitudinal branch with two-three chambers (Fig. 4).

Idiosoma. Propodosomal plate weakly sclerotized, deeply concave on anterior margin. Setae *ve* and *sci* subequal in length. Hysterosomal plate with indistinct margins. Hysterosomal setae *l1* and *d2* subequal in length and about four times longer than *l2*. Pygidial setae *d4* and *d5* subequal in length. Cuticular striations as in Figures 1 & 2.

Legs. Setae *tc''III-IV* 1.2-1.3 times longer than *tc'III-IV*. Setae *p'* and *p''* of legs III and IV with 7-8 tines (Fig. 5). Coxae I-IV well developed.

Lengths of setae: *ve* 30 (30-40), *sci* 35 (30-40), *b* 220 (205-235), *sce* (235-250); *d1* (225-250); *l1* 195 (210-220); *l2* 55 (45); *l4* 45 (40); *l5* 280 (260); *d2* 195 (195-205); *d4* 30 (30-40); *d5* 30 (30); *a1* and *a2* 20 (15-20); *g1* and *g2* (20-30); *pg1* 90 (80-90); *pg2* (65-70); *pg3* (95-

105); *sc2* 20; *sc3* (25); *sc4* 25 (25); *tc'III-IV* 35 (30-35); *tc''III-IV* 45 (45).

• Type material

Holotype female (No. Syr.11.1) and four female paratypes from the Orange River Francolin *Francolinus levalliantoides* (Smith, 1836) (Galliformes: Phasianidae) from South Africa, no other data. Holotype and paratypes are deposited at UAM except one female paratype at ZIN.

• Etymology

The name *francolinus* refers to the generic name of the host.

• Differential diagnosis

The females of the new species are distinguished from other species of this genus: *G. bochkovi* sp. n. and

G. lophurus sp. n. (cf. *infra*) by the presence of subequal hysterosomal setae *d2* which are about four times longer than *l2*. In the females of *G. bochkovi* and *G. lophurus* setae *d2* and *l2* are short and subequal in the length.

GALLIPHILOPSIS BOCHKOVI SP. N.

• Female (Figs 6-9)

Total body length of holotype 495 (435-535 in four paratypes).

Gnathosoma. Stylophore constricted posteriorly, 155 (145-165) long. Peritremes M-shaped, each transversal branch with two chambers, each longitudinal branch with three chambers (Fig. 8).

Idiosoma. Propodosomal plate deeply concave on anterior margin and between setae *d1* and *sce*. Setae *ve* and *sci* subequal in length. Hysterosomal plate with indistinct margins. Hysterosomal setae *l2* and *d2* sub-

equal in length and 4-5 times shorter than *l1*. Pygidial setae *l4* 1,7 times longer than *d4* and *d5*. The length ratio of paragenital setae *pg1*, *pg2* and *pg3* 1.2-1.3: 1:1.6. Cuticular striations as in Figures 6 & 7.

Legs. Setae *tc'' III-IV* 1.5 times longer than *tc' III-IV*. Setae *p'* and *p''* of legs III and IV with 7-8 tines (Fig. 9). Coxae I-IV well sclerotized.

Lengths of setae: *ve* 35 (30-35), *sci* 35 (40), *b* (215-245), *sce* (245-270); *d1* 265 (275-295); *l1* 175 (170-180); *l2* 45 (40-45); *l4* 60 (70-80); *l5* (300-355); *d2* 40 (35-40); *d4* 40 (40-45); *d5* 30 (35); *a1* 15 (15-20); *a2* 20 (20); *g1* 25 (35); *g2* 35 (40); *pg1* (90-95); *pg2* (70-75); *pg3* (115-125); *sc1* (15); *sc2* (25); *sc3* 40 (30-40); *sc4* 25 (25-30); *tc' III-IV* 25 (30); *tc'' III-IV* 35 (45).

• Type material

Holotype female (No. Syr.12.1) and four female paratypes from *Tragopan* sp. (Galliformes: Phasianidae) from Himalaya, no other data. Holotype and most of

Figs 6-9. – *Galliphilopsis bochkovi* sp. n. Female. 6. Dorsal view. 7. Ventral view. 8. Peritremes. 9. Fan seta *p'III*.

paratypes are deposited at UAM except two female paratypes at ZIN.

- Additional material

4 females (Nos. Syr.13.1-4) from the Barbary Partridge *Alectoris barbara* (Bonnaterre, 1791) (Galliformes: Phasianidae) from Sicily, Italy, no other data. Whole material is deposited at UAM.

- Etymology

This species is dedicated to Dr Andre V. Bochkov (Zoological Institute Russian Academy of Sciences, St. Petersburg) a well known acarologist as well as our friend.

- Differential diagnosis

The females of this new species are distinguished from the other species of this genus: *G. francolinus* sp. n. and *G. lophurus* sp. n. (cf. *infra*) by the presence of hysterosomal setae *l1* which are 4-5 times

longer than *d2* and *l2*. In the females of *G. francolinus* sp. n. the setae *l1* and *d2* are subequal and about four times longer than *l2*. In the females of *G. lophurus* sp. n. the setae *l1*, *d2* and *l2* are short and subequal in the length.

GALLIPHILOPSIS LOPHURUS SP. N.

- Female (Figs 10-13)

Total body length of holotype 465 (455-465 in seven paratypes).

Gnathosoma. Stylophore constricted posteriorly, 140 (135-140) long. Peritremes M-shaped, each transversal branch with one-two chambers, each longitudinal branch with two-three chambers (Fig. 12).

Idiosoma. Propodosomal plate deeply concave on anterior margin. Setae *ve* and *sci* subequal in length. Hysterosomal plate fused with pygidial plate. Setae *d2*, *l4* and *d4* situated on hysterosomal plate. Hysterosomal

Figs 10-13. – *Galliphilopsis lophurus* sp. n. Female. 10. Dorsal view. 11. Ventral view. 12. Peritremes. 13. Fan seta *pIII*.

setae *l1*, *l2* and *d2* subequal in length. Pygidial setae *l4*, *d4* and *d5* subequal in length. Setae *l5* long, about 10 times longer than *l4*, *d4* and *d5*. Paragenital setae *pg1*, *pg2* and *pg3* subequal in length. Cuticular striations as in Figures 10 & 11.

Legs. Setae *tc''' III-IV* 1.2 times longer than *tc''' III-IV*. Setae *p'* and *p''* of legs III and IV with 6-8 tines (Fig. 13). Coxae I-IV well sclerotized.

Lengths of setae: *ve* (30-35), *sci* (30-40), *b* (205-215), *d1* (240); *l1* 25 (20-25); *l2* 25 (20-25); *l4* 40 (35); *l5* (330); *d2* 25 (20-25); *d4* 35 (30); *d5* 25 (25-35); *a1* and *a2* 15 (15); *g1* 30 (25-30); *g2* 35 (25-35); *pg1* (80); *pg2* (80); *pg3* (80); *sc1* 15 (15); *sc2* 20 (15-20); *sc3* 25 (20-25); *sc4* (20); *tc''' III-IV* 35 (35); *tc''' III-IV* 45 (40-45); *ic1* 70 (75).

• Type material

Holotype female (No. Syr.18.1) and seven female paratypes from the Kalij Pheasant *Lophura leucomelanos* (Latham, 1790) (Galliformes: Phasianidae), no other data. Holotype and most of paratypes are deposited at UAM except two female paratypes at ZIN and one female paratype at SNM.

• Etymology

The name *lophurus* refers to the generic name of the host.

• Differential diagnosis

The females of this new species are distinguished from the other species of this genus: *G. francolinus* sp. n. and *G. bochkovi* sp. n. (cf. *supra*) by the pre-

Figs 14-18. – *Mironovia rouloul* sp. n. Female. Female. 14. Dorsal view. 15. Ventral view. 16. Peritremes. 17. Seta *vi*. 18. Fan seta *p'III*.

sence of subequal hysterosomal setae *l1*, *d2* and *l2*. In the females of *G. francolinus* sp. n. the setae *l1* and *d2* are subequal and about four times longer than *l2*. In the females of *G. bochkovi* sp. n. the setae *l1* are 4-5 times longer than *d2* and *l2*.

MIRONOVIA ROULOUL SP. N.

• Female (Figs 14-18)

Total body length of holotype 590 (600 in one paratype).

Gnathosoma. Stylophore constricted posteriorly, 230 (235) long. Peritremes M-shaped, each transversal branch with two chambers, each longitudinal branch with six-seven chambers (Fig. 16).

Idiosoma. Propodosomal plate well sclerotized, bearing setae *vi*, *ve*, *sci*, *sce* and *d1*. Propodosomal setae with fine knobbs (Fig. 17), other idiosomal setae smooth. Length ratio of setae *vi*, *ve* and *sci* 1:1.4-1.6:3. Hysterosomal plate fused with pygidial plate. Setae *d2*, *l2*, *l4* and *d4* set on hysterosomal plate. Hysterosomal setae *l1* 1.4 times longer than *l2* and *d2*. Paragenital setae *pg2* 1.7-1.8 times longer than *pg1*. Cuticular striations as in Figures 14 & 15.

Legs. Epimeres I slightly divergent and not fused to epimeres II. Setae *tc''' III-IV* 1.6-1.7 times longer than *tc''' III-IV*. Setae *p'* and *p''* of legs III and IV with 8-10 tines (Fig. 18). Coxae I-IV weakly sclerotized.

Lengths of setae: *vi* 40 (40); *ve* 65 (55), *sci* 135 (120), *b* 215 (190), *sce* >195; *l1* 155 (125); *l2* 90 (90); *l4* 255; *l5* 395; *d2* 85 (90); *d4* 40 (35); *d5* 40 (35); *a1* and *a2* 15 (20); *g1* 30 (25); *g2* 35 (25); *pg1* 105 (90); *pg2* 185 (150); *sc1* (25); *sc2* (25); *sc3* 35 (35); *sc4* 30 (25); *tc''' III-IV* 35 (40); *tc''' III-IV* 65 (70).

Male unknown.

• Type material

Holotype female (No. Syr.17.1) and one female paratype from the Crested Partridge *Rollulus rouloul* (Scopoli, 1786) (Galliformes: Phasianidae) from Sumatra, no other data. Whole material is deposited at UAM.

• Etymology

The name *rouloul* refers to the specific name of the host.

• Differential diagnosis

The females of this new species differs from the type-species of this genus, *M. phasiani* Chirov and Kravtsova, 1995 described from *Phasianus colchicus* (Phasianidae) by the combination of the following features: the length ratio of setae *vi:ve:sci* is 1:1.4-1.6:3; the setae *l1* are longer than *l2* and *d2*. In females of *M. phasiani* the length ratio of setae *vi:ve:sci* is 1:1.3:1.4; the setae *l1* are shorter than *d2* and *l2*.

SYRINGOPHILUS BIPECTINATUS HELLER, 1880

Syringophilus bipectinatus is widely distributed in the world together with its host, the domestic chicken *Gallus gallus domesticus* (cf. Bochkov & Mironov, 1998). This species was also reported from *Ptilopachus petrosus* from Cameroun (Skoracki & Sikora, 2003). Below, we give additional new host species for *S. bipectinatus*.

• Material examined

15 females, three males, four nymphs, one larva from the Red-legged Partridge *Alectoris rufa* (L., 1758) (Galliformes: Phasianidae) from Corsica, no other data. Most part of this material is deposited at UAM except two females, one male at ZIN and two females at SNM.

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