Three new species of the genus *Passeroptes* Fain (Astigmata: Dermatonicidae) from China

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Abstract

Three new species of the genus *Passeroptes* (Acariiformes: Dermatonicidae) are described from passerine birds (Passeriformes) in China: *Passeroptes formosus* sp. nov. from *Garrulax formosus formosus* (Verreaux) (Guizhou), *P. poecilorhynchus* sp. nov. from *Garrulax poecilorhynchus berthemyi* (David and Oustalet) (Guizhou), and *P. picae* sp. nov. from *Pica pica sericea* Gould (Henan). *Passeroptes garrulax* is redescribed from *Garrulax poecilorhynchus berthemyi* in Guizhou.

Key words: feather mites, Dermatonicidae, *Passeroptes*, new species, China

Introduction

Mites of the family Dermatonicidae (Astigmata: Analgoidea) live on the skin of birds. This family includes three subfamilies, Apocnemidocoptinae, Dermatonicinae and Otocoptoidinae (Mironov et al. 2005; Bochkov & Mironov 2011). Within the subfamily Dermatonicinae, the genus *Passeroptes* originally included two subgenera, *Passeroptes* and *Paddacoptes* (Fain 1964). The former subgenus was ranked to the generic status by Gaud & Atyeo (1996). To present, the genus *Passeroptes* includes 21 species (Fain & Bochkov 2003; Mironov et al. 2005; Bochkov & Mironov 2012).

To date, a single species from the genus *Passeroptes* has been reported in China, *P. dermicola* (Trouessart) from *Passer montanus* (Linnaeus) (Passeriformes: Passeridae) (Wang & Wang 2012). In this paper, we describe three new species of *Passeroptes* from passerines in China. We also include figures of *P. garrulax* Fain, 1965 because this species was only described but not figured (Fain 1965).

Material and methods

Mites were cleared in lactic acid, slide-mounted in polyvinyl lactophenol medium, and dried for 4 days at 50 °C. Drawings were made using a camera lucida attached to an Olympus BX51 (Japan) microscope with differential interference contrast optics. In species descriptions, all measurements are given in micrometres (µm). Idiosomal length was measured from the anterior margin of the propodonotum to the posterior end of the opisthosomal lobes. Widths of the idiosoma and hysteronotal shields were measured at the level of setae *cp*. The length of the propodonotal shield was measured along the median line of the shield. The width of the propodonotal shield was measured at its widest part, at the level of setae *se*. The length of the hysteronotal shield was measured along its lateral border. Lengths of the posterior legs were measured from the most basal point of the trochanter to the apex of the tarsus, excluding the pretarsus.

The terminology relating to the idiosomal setation follows Griffiths et al. (1990) with modifications of Norton (1998) concerning coxal setae. The leg setation follows Grandjean (1939). Holotypes (male) and paratypes of all species described here are deposited in the Institute of Entomology, Southwest University, Chongqing, China. Host systematics follows Zheng (2002, 2011).
Systematics

Family Dermatophagidae Fain, 1965

Subfamily Dermatophaginae Fain, 1965

Genus Passeroptes Fain, 1964

*Passeroptes formosus* sp. nov.

(Figs. 1, 2, 3)

**FIGURE 1.** *Passeroptes formosus* sp. nov., male. A—dorsal view, B—ventral view.

**Description.** MALE (holotype). Body 205 long (185–240 in 9 paratypes) and 155 wide (135–175). Idiosomal shields devoid of ornamentation, soft idiosomal cuticle striated, without scales or tubercles. **Dorsum.** Distance between propodonotal and hysteronotal shields about 11. Propodonotal shield: 40 long (37–54) and 55 wide (52–74), its posterolateral extensions encompassing bases of setae *se*. Posterior margin of propodonotal shield not straight, corrugated. Setae *se* short, only about 9 long. Hysteronotal shield transversally separated at level of femora IV; its anterior part 65 long (57–66) and 94 wide (88–100), its lobar part paired, 79 long (74–84) and 28 wide (23–28). Distance between lobar hysteronotal shields 31 (28–34). Setae *d2* present. Humeral shields well developed, with bent extensions, forming acute angle. Terminal cleft about 75 long. Posterior interlobar membranes overlapping 9 wide (9–11). **Venter.** Coxal fields III opened in anterior third. Genital arch as an inverted V with tips strongly curved laterally. Aedeagus about 14 long. Adanal shields 18 long (16–19) and 4 wide (4–5), subparallel to each other. Coxal apodeme IVb 23 long (20–23) and 3 wide (3–4). Diameter of adanal suckers about 11. Cupules *ih* situated postero-lateral to adanal suckers. **Legs.** Legs III and IV subequal, 100–110 long. Femora III with 1 dorsal and 1 ventral moderately developed retrorse processes. Solenidion *ωI* absent. Setae *ba-I*, *II* absent. Tarsi IV curved medially and produced apically. Length of setae: *cp* 83 (89–115), *c3* 25 (26–31), *h2* 155 (150–170),
THREE NEW SPECIES OF THE GENUS PASSEROPTES FAIX FROM CHINA


Type material. Holotype male, 9 male and 10 female paratypes ex Garrulax formosus formosus (Verreaux) (Passeriformes: Timaliidae), CHINA: Guizhou, Guiyang, 26°56'04" N, 106°44'17" E, 5 January 2013, coll. X.-H. Su.

**FIGURE 3.** Passeroptes formosus sp. nov., female. A—dorsal view, B—ventral view.

**Etymology.** The specific epithet derives from the specific name of the host.

**Differential diagnosis.** The new species is closest to Passeroptes eulabis Fain, 1965 from Gracula religiosa Linnaeus (Eulabes javana Cuvier was used in Fain's original paper) (Passeriformes: Sturnidae) (Fain 1965). In both sexes of these two species, setae se are short and setae d2 are present; in males, only femora III have retrorse processes and tarsi IV are curved medially and produced apically; in females, coxal fields III are closed and femora III and IV each bear the one dorsal and one ventral retrorse process. The new species differs from P. eulabis in the following features. In both sexes of P. formosus sp. nov., trochanters I and II have no processes, setae ba I and II are absent, and the humeral shields have bent extensions; in males, the hysteronotal shield is transversely separated, and coxal apodemes IVb are subequal to the adanal shields; in females, the posterior angles of the hysteronotal shield have oval-shaped extensions and the adanal shields are well developed and bear setae ps3. In both sexes of P. eulabis, setae ba I, II are present; in males, the hysteronotal shield is not separated transversally and the adanal shields are wider than the coxal apodemes IVb; in females, the posterior angles of the hysteronotal shield are round and not produced, the adanal shields are short and setae ps3 are situated off these shields, and trochantera I and II have small conical lateral processes.

**Passeroptes poecilorhynchus sp. nov.**
(Figs. 4, 5)

**Description.** MALE (holotype). Body 190 long (185–200 in 3 paratypes) and 125 wide (120–145). Idiosomal shields devoid of ornamentation, soft idiosomal cuticle striated, without scales or tubercles. **Dorsum.** Distance between propodonotal and hysteronotal shields about 22. Propodonotal shield 47 long (42–51) and about 68 wide (51–70), posterolateral extensions encompassing bases of setae se and si. Posterior margin of propodonotal shield not straight, corrugated. Setae se about 32 long. Hysteronotal shield transversely separated. Its anterior part 57 long (52–57) and 83 wide (75–83), its lobar part paired, 73 long (63–74) and 29 wide (26–33). Setae d2 absent. Humeral shields well developed, with bent extensions. Opisthosomal lobes about 70 long, separated from each other.

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Terminal cleft longer than its greatest width. Venter. Coxal apodeme IIIa weakly developed, not entire shields, coxal fields III opened. Genital arch as an inverted V with tips strongly curved laterally. Aedeagus 22 long (15–22). Adanal shields 29 long (26–29) and about 4 wide, subparallel to each other. Coxal apodeme IVb about 18 long (15–18) and 2 wide (2–3). Diameter of adanal suckers 9 (7–9). Cupules ih situated at posterior of adanal suckers.

Legs. Legs III thinner than legs IV, about 92 long. Femora III with 1 dorsal and 1 ventral weakly developed retrorse processes. Other processes on legs III and IV absent. Solenidion ωI absent. Setae ba 1, II absent. Tarsi IV curved medially and produced apically. Lengths of setae: c3 28 (22–26), h2 160 (150–160), h3 21 (21–32), ps1 18 (17–19), ps2 26 (24–28), d II 69 (64–72), d III 80 (66–80), ω3 about 15, ωIII about 22, φ I 28 (30–33), φ II 45 (44–49), φ III about 3, φ IV about 22, aII 14 (12–15), and σ II about 3.


Type material. Holotype male, 3 male and 5 female paratypes ex Garrulax poecilorhynchus berthemyi (David and Oustalet) (Passeriformes: Timaliidae), CHINA: Guizhou, Guiyang, 26°56'04'' N, 106°44'17'' E, 5 January 2013, coll. X.-H. Su.

Etymology. The specific epithet derives from the specific name of the host.

**FIGURE 4.** Passeroptes poecilorhynchus sp. nov., male. A—dorsal view, B—ventral view, C—dorsal view of tarsus IV.

**Differential diagnosis.** The new species is closest to Passeroptes turdoides Fain and Bochkov, 2003 from Turdoides jardineii (Passeriformes: Timaliidae) (Fain & Bochkov 2003). In both sexes of these two species, setae d2 are absent; in males legs IV are slightly thicker than legs III; and in females, setae se do not extend to the anterior margin of the hysteronotal shield, coxal fields III are closed, and femora III and IV each bear one dorsal and one ventral retrorse process. The new species differs from *P. turdoides* by the following features. In both sexes...
of *P. poecilorhynchus* sp. nov., setae *ba*-I, II are absent; setae *se* are 4–5 times longer than *si*; in males, the hysteronotal shield is transversely separated and legs IV lack processes; in females, the ventral retrorse processes on femora III and IV are moderately developed. In both sexes of *P. turdoides*, setae *ba*-I, II are present; in males, the hysteronotal shield is not transversely separated, setae *se* are only 1–2 times longer than *si*, and tibia IV bears a strong sub-basal ventral process directed apically; in females, the ventral retrorse processes on femora III and IV are well developed.

**FIGURE 5.** *Passeroptes poecilorhynchus* sp. nov., female. A—dorsal view, B—ventral view.

**Passeroptes picae** sp. nov.  
(Figs. 6, 7, 8)

**Description.** MALE (holotype). Body 195 long (190–205 in 3 paratypes) and 130 wide (140–160). Idiosomal shields devoid of ornamentation, soft idiosomal cuticle striated, without scales or tubercles. **Dorsum.** Distance between propodonotal and hysteronotal shields about 23. Propodonotal shield 54 long (46–52) and 80 (56–67) wide, postero-lateral extensions encompassing bases of setae *se* and *si*. Posterior margin of propodonotal shield not straight. Setae *se* about 38 long. Hysteronotal shield 120 (120–125) long, its length along midline 78 (81–85); with pair of deep lateral incisions at level of femora IV; anterior edge of lateral incisions not straight. Anterior part of hysteronotal shield (at lateral incisions) narrower than posterior part of hysteronotal shield. Setae *d2* absent. Humeral shields well developed, with bent extensions. Opisthosomal lobes about 39 long, widely separated from each other. **Venter.** Coxal apodeme I to IV free. Genital arch an inverted V with tips strongly curved laterally. Aedeagus short, about 10 long. Adanal shields present, separated from each other, 22 long (21–24) and 5 wide (4-6). Diameter of adanal suckers about 7. Cupules *ih* situated posterior of adanal suckers. **Legs.** Legs III and IV subequal, 85–95 long. Genua I and II each with 1 dorsal weakly developed retrorse processes. Processes on femora III reduced to very small and indistinct transversal crest on dorsal surface. Solenidion *ω1* absent. Tarsi IV straight. Lengths of setae: *cp* 96 (97–101), *c3* 28 (30–32), *h2* (160–170), *h3* 35 (33–48), *ps1* 19 (19–23), *ps2* 37 (32–36), *d*
II 79(62–72), d III 88 (76–80), ω III about 15, ω II I about 22, ϕ I 27 (24–28), ϕ II 38 (34–40), ϕ III about 3, ϕ IV about 16, σ/I 20 (20–23), and σ II about 3.

**FIGURE 6.** *Passeroptes picae* sp. nov., male. A—dorsal view, B—ventral view.

**FIGURE 7.** *Passeroptes picae* sp. nov., female. A—dorsal view, B—ventral view.


Etymology. The specific epithet derives from the generic name of the host.

Differential diagnosis. Among species devoid of setae d2 the new species is closest to Passeroptes inermis Fain, 1965 from Calocitta formosa (Swainson) (Passeriformes: Corvidae) (Fain 1965). In both sexes of these two species the retrorse processes of femora III and IV are absent or reduced to a very small and indistinct transverse crest on the dorsal surface; the shape of the humeral shields is similar, with bent extensions; coxal apodemes II to IV are free. In males the hysteronotal shield is not transversely divided, the anterior part of the hysteronotal shield is narrower than the lobar part of the shield; in females, setae se are short and not extending the anterior margin of the hysteronotal shield, and the adanal shields are well developed and not fused. The new species differs from P. inermis by the following features. In both sexes of P. picae sp. nov., one weakly developed dorsal retrorse process is present on each of genua I and II; in males, setae se extend beyond the anterior margin of the hysteronotal shield and the adanal shields are short and wide; in females, setae se extend beyond a level halfway between the propodonotal and hysteronotal shields. In both sexes of P. inermis, genua I and II are without retrorse processes; in
males, setae se do not extend beyond the anterior margin of the hysteronotal shield; in females, setae se do not extend beyond halfway between the propodonotal and hysteronotal shields.

**Passeroptes garrulax** Fain, 1965
(Figs. 9, 10)

*Passeroptes garrulax* Fain, 1965: 87–90; 124–125

**FIGURE 9.** *Passeroptes garrulax* Fain, male. A—dorsal view, B—ventral view.


**FEMALE** (5 specimens). Body 205–235 long and 140–175 wide. Idiosomal shields without ornamentation, soft idiosomal cuticle striated, without scales or tubercles. **Dorsum.** Distance between propodonotal and hysteronotal shields about 30. Propodonotal shield 45–56 long and 60–65 wide, postero-lateral extensions

Legs. Legs III and IV subequal, 95–110 long. Femora III and IV each with 1 dorsal and 1 ventral moderately developed retrorse processes. Other processes on legs III and IV absent. Setae d2 thin. Humeral shields well developed, with bent extensions. Venter. Coxal fields III closed. Adanal shields well developed, separated from each other, encompassing setae ps1, ps2, ps3, h2, and h3.

Legs. Legs III and IV subequal, 95–110 long. Femora III and IV each with 1 dorsal and 1 ventral moderately developed retrorse processes. Other processes on legs III and IV absent. Setae d2 thin. Humeral shields well developed, with bent extensions. Venter. Coxal fields III closed. Adanal shields well developed, separated from each other, encompassing setae ps1, ps2, ps3, h2, and h3.

Lengths of setae: cp 72–84, c3 15–23, h2 140–155, h3 30–48, ps2 15–19, d II 52–61, d III 60–74, ω3 and ωIII about 15, φ I about 30, φ II about 36, φ III and φ IV about 2, σI I about 16, and σ II about 2.

![Figure 10](image-url)  
*Figure 10. Passeroptes garrulax Fain, female.* A—dorsal view, B—ventral view.

**Material examined.** 3 males and 5 females ex *Garrulax poecilorhynchus berthemyi* (David and Oustalet) (Passeriformes: Timaliidae). **CHINA:** Guizhou, Guiyang, 26°56'04" N, 106°44'17" E, 5 January 2013, coll. X.-H. Su.

**Remark.** Specimens of *P. garrulax* and *P. poecilorhynchus sp. nov.* were collected from the same individual of *Garrulax poecilorhynchus berthemyi* (David and Oustalet).

In the original description of *Passeroptes garrulax* Fain, 1965 from *Garrulax leucolopbus bicolor*, which had been imported from Indonesia and died in the Antwerp Zoo, Fain (1965) stated that the leg setation is as in *P. dermicola* and that tarsi I and II of *P. dermicola* possess setae ba. However, in our examined specimens of *P. garrulax*, setae ba were absent on tarsi I and II. Furthermore, in two other species, *P. formosus sp. nov.* and *P. poecilorhynchus sp. nov.*, collected by us from birds of the genus *Garrulax*, setae ba-I, II are also absent.

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