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A Review of the *lucidula*-Subgroup of the *Fannia canicularis* Species-Group (Diptera: Fanniidae)

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Ming-Fu Wang, Rong-Rong Wang, and Wan-Qi Xue (2007) A review of the *lucidula*-subgroup of the *Fannia canicularis* species-group (Diptera: Fanniidae). *Zoological Studies* **46**(2): 129-134. The *lucidula*-subgroup of Chillcott (1961) belongs to the *Fannia canicularis* species-group of Chillcott (1961) in the genus *Fannia* Robineau-Desvoidy, 1830 (family Fanniidae). A review of the *F. lucidula*-subgroup, previously known from 6 species, is expanded to include 3 additional species: *F. australis* Malloch, 1923, *F. hohxiliensis* sp. nov., and *F. latifrontalis* Hennig, 1955. The new species described here is from China. A key to the known species of the *F. lucidula*-subgroup is given. To facilitate comparisons of the species, the original diagnosis of the *F. canicularis* species-group has been expanded, and a key to its 3 subgroups, i.e., the *F. canicularis*-subgroup, *F. pusio*-subgroup, and *F. lucidula*-subgroup, is also given. Type specimens are deposited in the collections of the Institute of Zoology, Chinese Academy of Sciences, Beijing, China. http://zoolstud.sinica.edu.tw/Journals/46.2/129.pdf

Key words: Diptera, Fanniidae, *Fannia*, *Fannia lucidula*-subgroup, New species.

Fannia Robineau-Desvoidy, 1830, the largest genus of the family Fanniidae, occurs in all zoogeographic regions of the world and comprises over 285 species, the majority of which are from the Holarctic Region (Carvalho et al. 1993 2003). China belongs faunistically to 2 zoogeographic realms, namely the Palaearctic realm and the Oriental realm, and the greatest species diversity of *Fannia* is to be found in China. According to present knowledge, some 92 species of *Fannia* are known from China (Pont 1986, Xue and Chao 1996, Wang and Xue 2002).

The *lucidula*-subgroup belongs to the *canicularis* species-group of the genus *Fannia*. The *F. canicularis* species-group is one of 2 groups recognized by Hennig (1955-1964 1965), who listed the following group characters: upper orbital seta more or less distinctly developed in the male, hind coxa posteroventrally with 1 or more setulae, and male surstylus extending from the inner margin of abdominal tergite 9. Building on this, Chillcott (1961) revised the Nearctic species of the genus *Fannia* and published figures of the male genitalia for most of them. He recognized that the structures of the male genitalia are relatively stable. He assigned the 148 Holarctic species to 11 species-groups, including the *F. canicularis* species-group, and 15 subgroups. Based on his analysis of a large number of character states, he suggested that this group was primitive and was more closely related to the genera *Euryomma* Stein, 1899 and *Piezura* Rondani, 1866 than to other species-groups of *Fannia*. Using the morphological characters and the genitalic structures, he divided this group into 3 subgroups, the *F. canicularis*-subgroup, the *F. pusio*-subgroup (= *F. leucosticta*-subgroup), and the *F. glaucescens*-subgroup. This classification has been accepted and followed by many specialists (Pont 1964 1977, Rozkošný et al. 1997, Nishida 1991 2003 2004, Wang et al.

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2004). Because Pont (2002) found that the type of *F. glaucescens* (Zetterstedt, 1845) was actually a synonym of *F. armata* (Meigen, 1826) and so brought into use the synonym *F. lucidula* (Zetterstedt, 1860) to replace *F. glaucescens*, we use the name, *F. lucidula*-subgroup, instead of the *F. glaucescens*-subgroup. Nishida (2004) recently described 2 new species of the *F. lucidula*-subgroup from Japan.

Since Chillcott (1961), there have been some reviews of the species-groups of the genus *Fannia*. Pont (1977) and Rozkošný et al. (1997) respectively revised the Australian and European species and species-groups of *Fannia*. The Chinese species of the *F. carbonaria* species-group of Chillcott (1961) and the Palaearctic species of the *F. posticata* species-group have recently been revised by Wang et al. (2004 2006). In this paper, we continue this series of reviews of the species-groups of *Fannia*.

While checking a series of *F. lucidula*-subgroup specimens in the collections of the Institute of Zoology, Chinese Academy of Sciences, Beijing and the Institute of Entomology, Shenyang Normal University, Shenyang, China, we found 1 further undescribed species, which is closely related to *F. latifrontalis* Hennig, 1955. The *F. lucidula*-subgroup, which was previously known from 6 species, is expanded to include 3 additional species: *F. australis*, *F. hohxiliensis* sp. nov., and *F. latifrontalis*. This has given us an opportunity to provide an expanded definition of the *F. canicularis* species-group and of the *F. lucidula*-subgroup. The *F. lucidula*-subgroup now comprises 9 species worldwide, two of which occur in China.

The primary aims of this article were to review the *F. lucidula*-subgroup, to describe the new species, and to discuss its relationship to closely related species. Keys to the 3 subgroups of the *F. canicularis* species-group and to the known species of the *F. lucidula*-subgroup are also given.

MATERIALS AND METHODS

Materials and methods

The specimens examined in the course of this study were collected by sweeping from brushwood in mountainous regions. Specimens were dried and studied, and are deposited in the Institute of Entomology, Shenyang Normal University, Shenyang, China and in the collections of the Institute of Zoology, Chinese Academy of Sciences, Beijing, China.

The external morphology was observed under a stereoscopic microscope and metric characters were measured with an ocular micrometer. To observe the detailed characters of the male terminalia, these organs were detached from the body, cleared by warming in a 10% KOH solution (at approximately 100°C) for several minutes, placed in a droplet of glycerol, and observed under a compound light microscope.

Photographs and drawings

Photographs of the types were taken with a Nikon® D 70 digital camera. The digital images were then imported into Adobe Photoshop 7.0 for labeling and plate composition. Line figures were drawn with the aid of a camera lucida mounted on a Zeiss Stemi SV-11 stereomicroscope, and scanning electron microscope photographs were taken of some characters.

Terminology

The morphological terminology follows McAlpine (1981). Absolute measurements are used for body length in millimeters (mm). Abbreviations used for characters include *acr*, acrostichal seta; *ad*, anterodorsal seta; *av*, anteroventral seta; *d*, dorsal seta; *dc*, dorsocentral seta; *ia*, intra-alar seta; *p*, posterior seta; *pd*, posterodorsal seta; *pra*, prealar seta; *pv*, posteroventral seta; and *v*, ventral seta.

TAXONOMIC ACCOUNT

Fannia canicularis species-group

Fannia canicularis species-group: Chillcott 1961: 185.
Fannia canicularis species-group, Rozkošný et al. 1997: 49.

Diagnosis: Lower calypter usually distinctly projecting beyond upper one; male mid coxa lacking hooked spines; hind coxa with some small setulae on inner posterior margin (rarely absent); hind tibia of most species with an *ad* row that includes 1 or 2 strong *ad*; male katepisternum without spines on lower margin; *pra* usually small, hair-like, but if strong then proepisternum with hairs; male cerci triangular in form, rarely rectangular, surstyli with 2 branches, the anterior one usually with hairs, but if surstyli not branched then these structures short, broad, and heavily sclero-

tized; some males with stout setae on parafacial, and females with setae or setulae only on upper parts of parafacial.

For a detailed description of the adults and eggs, see Chillcott (1961: 185).

Distribution: Palaearctic, Nearctic, Australasian, and Oceanian regions.

Key to the known subgroups of the *F. canicularis* species-group

1. Abdominal tergites without lateral markings, only with median longitudinal stripes or triangular markings, or even lacking markings.....2
- Abdominal tergites 3 and 4 with median longitudinal stripes and lateral spots .....*F. leucosticta*-subgroup
2. At least 1 surface (including *av*, *ad*, *pd*, or *pv* surface) of hind tibia with 2 or more setae, but if only with 1 seta then abdominal tergites usually with triangular markings, male cerci gradually constricted towards apex, triangle-like, surstyli with 2 branches, anterior one usually with hairs.....*F. canicularis*-subgroup
- Each surface (including *av*, *ad*, *pd*, or *pv* surface) of hind tibia usually with only 1 seta, but if with 2 setae then parafacial with strong setae; abdominal tergites with or without median longitudinal stripes; male cerci rectangle-like, surstyli heavily sclerotized, broad, and short, and unbranched.....*F. lucidula*-subgroup

Key to the known species of the *F. lucidula*-subgroup (mainly males)

1. Parafacial with strong setae 2
- Parafacial bare or with only short setulae 3
2. Parafacial with 3 or 4 stout setae and numerous setulae, proboscis moderately long.....*Fannia latifrontalis* Hennig, 1955 (female) (Europe: Sweden, Finland)
- Parafacial with 11-14 stout setae and setulae, proboscis slender and long, prementum 7-8 times as long as high.....*Fannia hohxiliensis* sp. nov. (China: Hohxili)
3. Parafacial with short setulae 4
Parafacial bare.....5
4. Upper 1/2 of parafacial with a row of short setulae, abdominal tergites with broad median longitudinal stripes.....*Fannia lineata* (Stein, 1895) (widespread throughout Europe)
- Median part of parafacial with 1-3 short setulae, abdominal tergites with narrow median longitudinal stripes .....*Fannia rokkoensis* Nishida, 2004 (Japan: Honshu)
5. Hind coxa with setulae on inner posterior margin..... 6
- Hind coxa bare on posterior surface.....
.....*Fannia cana* Nishida, 2004 (Japan: Hokkaido)
6. Apex of abdomen not globular, sternites dull and not projecting.....7
- Apex of abdomen globular, sternite 5 shiny black, projecting downwards.....*Fannia lucidula* (Zetterstedt, 1845) (China, Mongolia, Europe, Nearctic Region)
7. Frons narrow, frontal vitta at most as wide as fronto-orbital plate 8
- Frons broad, frontal vitta about 2 times as wide as fronto-orbital plate .....
.....*Fannia latifrons* Malloch, 1914 (Nearctic Region)
8. Hind femur with *av*, 1st flagellomere 2.5 times as long as wide ..... *Fannia morosa* (Wulp, 1896) (Nearctic Region)
- Hind femur without *av*, 1st flagellomere 2.0 times as long as wide .....*Fannia australis* Malloch, 1923 (Australia)

Known species of the *F. lucidula*-subgroup in China

Fannia lucidula (Zetterstedt, 1860)

Aricia lucidula Zetterstedt 1860: 6248.
Fannia glaucescens of authors [misidentifications], see Pont 2002: 106.

For detailed descriptions and figures of the adults, see Chillcott (1961: 206-207, figs. 140A-E, 216, 262); Hennig (1955-1964: 45-46, figs. 14, 68); Rozkošný et al. (1997: 39, figs. 8, 9); Xue and Chao (1996: 824, fig. 1946).

Specimens examined: 1 ♂, China, Xinjiang, Taglak, 2500 m, 26 June 1976, coll. Yanheng Han; 1 ♂, Shanxi, Hunyuan, 7 June 1986, coll. Mingfu Wang; 1 ♂, Inner Mongolia, Xilinhot, 29 Aug. 1971.

Distribution: China (Shanxi, Inner Mongolia, Qinghai, Xinjiang), Mongolia, Europe, Nearctic Region.

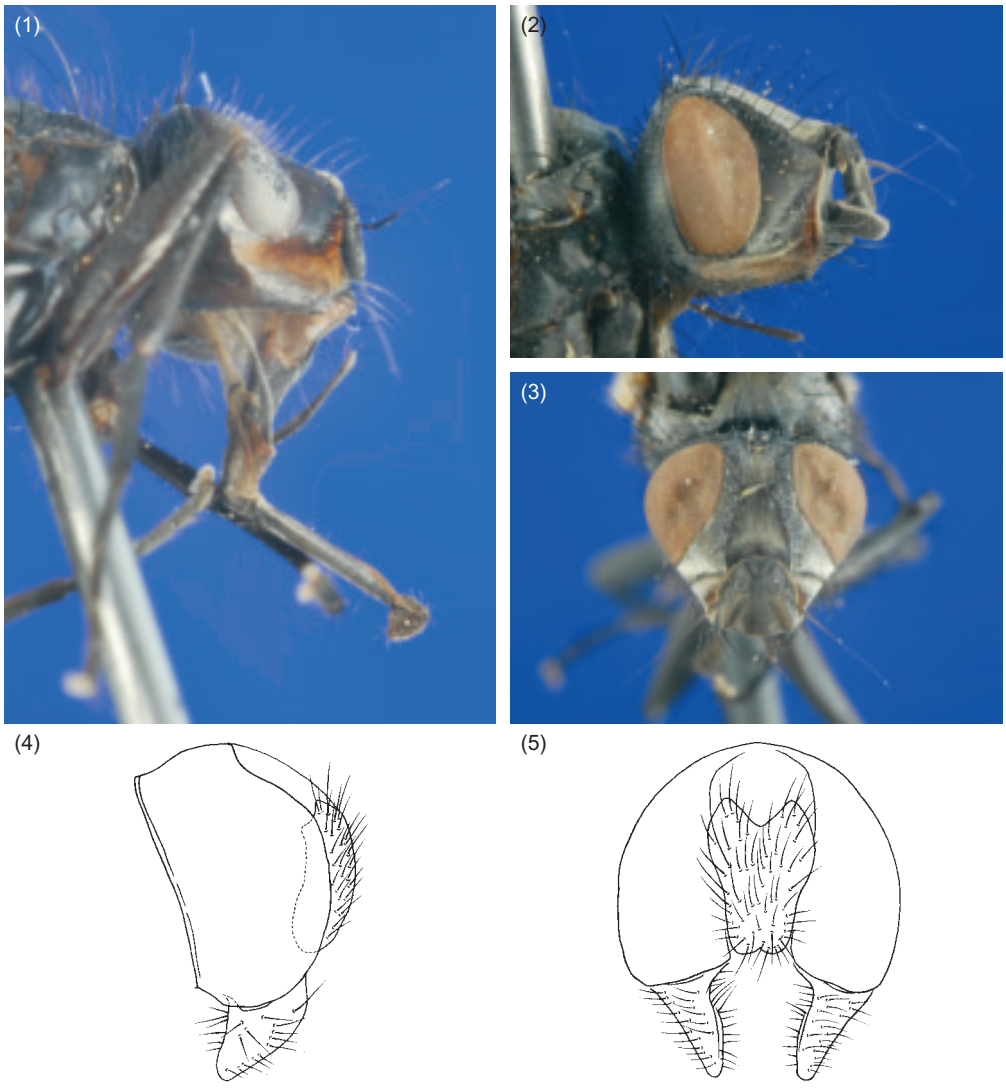
Fannia hohxiliensis sp. nov.

(Figs. 1-5)

Description: Male: Body length 5.5-6.8 mm. Eye with sparse but long hairs; fronto-orbital plate and parafacial with dense silvery-gray pruinosity, frons about 3.5-4.0 times as wide as 1st antennal flagellomere and 2/7 of head width, frontal vitta black, with thin yellowish pruinosity, about 2.5 times as wide as fronto-orbital plate, frontal setae 5 or 6, gaps filled with fine setae, nearly reaching ocellar triangle, outer part with 1 or 2 rows of short setae, 1 upper orbital seta; ground color of parafacial black, extremely broad, with a row of about 11-14 strong setae of which 7 or 8 are very strong, setae forming a row on upper part to lower posterior part and situated on dividing line between parafacial and genal groove, parafacial at middle about 2.7-3 times width of 1st flagellomere, ground color of genal groove brown, with thin yellowish pruinosity; antenna black, 1st flagellomere 2.0 times as long as wide, arista haired; epistoma projecting to vibrissal angle and slightly beyond frontal angle, vibrissal angle behind frontal angle in profile; gena and metacephalon with black hairs, genal height about 1/4 of eye height; proboscis slender and long, prementum with yellowish-gray pruinosity, 7-8 times as long as wide; palpus black, slender and long, about 4/5 length of prementum.

Ground color of thorax black, slightly shiny, notum with thin brown pruinosity, without marks; presutural *acr* triserial, *dc* 2+3, *ia* 0+2, *pra* indistinct; notopleural setae 2; ventral surface and lateral margin of scutellum bare; basisternum, proepisternum, anepimeron, meron, and katepimeron bare; katepisternals 1+1, katepisternum without ventral spines; spiracles yellowish-brown; calypters yellowish, lower one distinctly projecting. Wing yellowish; tegula black, basicosta brownish-yellow, costal spine conspicuous; vein C with a row of small spines on upper surface; node of Rs bare on ventral and dorsal surfaces; veins R_{4+5} and M straight; crossveins without obvious cloud; halteres yellow. Legs entirely black; fore tibia without median *p*, with 1 stout apical *d* and 1 stout apical *v*, fore tarsomere 1 with 1 or 2 basal setulae on ventral surface; mid coxa lacking hooked spines or spine-like setae on lower and outer margins, mid femur with complete av row, becoming gradually shorter towards apex, *ad* row complete, *pv* row complete, slightly biserial towards apex, mid tibia with 1 *ad* and 1 *pd*, without *av* and *pv*, mid tarsomere 1 without basal tooth-like spines on ventral surface; hind coxa with a pair of setulae on posterior surface, hind femur with a short *av* row in basal 1/2 and a strong *av* row in distal 1/2, *pv* row short, hind tibia with 1 *av*, 2 *ad* and 1 stout submedian *d*, without *pd* or *pv*. Abdomen long-ovate, shiny black, depressed and flattened, without distinct pollinosity or marks; sternite 1 bare.

Female: Unknown.



Figs. 1-5. *Fannia hohxiliensis* sp. nov. (1) Male proboscis of paratype, lateral view; (2) male head of holotype, anterior view; (3) male head of holotype, lateral view; (4) male terminalia of holotype, lateral view; (5) male terminalia of holotype, ventral view.

Types: *Holotype*: ♂, China, Qinghai Province, Mt. Hohxili, 5100-5200 m, 21 July 1990, Coll. Xuezhong Zhang. *Paratype*: 1 ♂, 27 June 1990, other data as for holotype.

Etymology: The specific name is derived from the name of the type locality.

Remarks: This new species resembles *F. latifrontalis* Hennig, 1955, of which only the female is known, but differs from it in having a slender and long proboscis, a prementum about 7-8 times as long as its height; 1 upper orbital seta; a triserial presutural *acr*; a conspicuous costal spine; mid tibia without av or *pv*; and hind tibia with 1 *av*.

Distribution: China, Qinghai Prov.

DISCUSSION

Monographs of Palaearctic, Nearctic, Australasian, and European species with the comprehensive descriptions and keys by Hennig (1955-1964), Chillcott (1961), Pont (1977), and Rozkošný et al. (1997) are very useful for taxonomic studies of the Fanniidae. They provide a sound basis for the comprehensive study of this family at the species-group level. While studying specimens of the genus *Fannia* from the Qinghai-Xizang Plateau, China, we found 1 new species which belongs to the *F. lucidula*-subgroup. After a systematic study of this species and related species, *F. australis* Malloch, 1923 and *F. latifrontalis* Hennig, 1955 were also assigned to this subgroup.

So far, only the female of *F. latifrontalis* is known. As the species-groups were defined by male morphological characters and especially by the genitalic structures, Chillcott (1961) listed this species as a "species of questionable affinities". *Fannia latifrontalis* is a rare species but can be easily distinguished from other *Fannia* by possessing a row of strong setae on the parafacial. The new species described here is also characterized by this special character, but it differs from *F. latifrontalis* by having a proboscis that is extraordinarily slender and long, with the prementum about 7-8 times as long as high. A number of reliable characters, including the 2 discussed above, were previously described by Chillcott (1961) as being species diagnostic characters. In addition to these 2 characters, numbers of presutural acrostichal rows and tibial setae are also useful for differentiating the species. So we can confirm that *F. latifrontalis* and the new species are separate species and that both belong to the *F. lucidula*-subgroup.

When we consulted the descriptions and figures of Pont (1977), the morphological characters and especially the male genitalic structures of *F. australis* showed that this species can also be assigned to this subgroup.

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