Taxonomic review of the \textit{posticata}-group of \textit{Fannia} Robineau-Desvoidy (Diptera: Fanniidae), with the description of two new species from China

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\textbf{Abstract.} One of the species-groups of the genus \textit{Fannia} Robineau-Desvoidy 1830, is the \textit{posticata}-group of Chillcott (1961). A review of the \textit{F. posticata}-group is expanded to include 21 species worldwide. Two species are described as new to science from China: \textit{Fannia dianensis} n. sp. and \textit{Fannia punctifemoralis} n. sp. \textit{Fannia dasytophacela} Feng & Xue is assigned to this group. \textit{Fannia posticata} (Meigen) is redescribed, and a key to the known species of the \textit{F. posticata}-group is provided.

\textbf{Résumé.} Révision taxonomique du groupe de posticata des \textit{Fannia} Robineau-Desvoidy (Diptera : Fanniidae), avec la description de deux nouvelles espèces de Chine. Parmi les groupes d’espèces du genre \textit{Fannia} Robineau-Desvoidy 1830, on prend en considération ici le groupe de posticata de Chillcott (1961). Une révision de ce groupe de \textit{F. posticata} est étendue jusqu’à inclure 21 espèces du monde entier. Deux espèces nouvelles pour la science sont décrites de Chine : \textit{Fannia dianensis} n. sp. et \textit{Fannia punctifemoralis} n. sp. \textit{Fannia dasytophacela} Feng & Xue est assigné à ce groupe. \textit{Fannia posticata} (Meigen) est redécrite. Une clef des espèces connues du groupe de \textit{F. posticata} est présentée.

\textbf{Keywords:} Diptera, Fanniidae, \textit{Fannia}, \textit{F. posticata}-group, new species.

\textbf{Material, methods and terminology} Specimens of the five species of the \textit{F. posticata}-group occurring in China were examined. For detailed descriptions and figures of the other 16 previously described species, see Chillcott (1961a, b), Pont (1977), Kurahashi (1971), Rozkošný \textit{et al.} (1997), Xue & Wang (1998), Wang \textit{et al.} (2006), and Feng \& Xue (2006). The specimens examined in the course of this study are deposited in the collections of the Institute of Entomology, Shenyang Normal University, Shenyang, China.


The greatest species diversity of \textit{Fannia} is to be found in China where, according to present knowledge, over 100 species of \textit{Fannia} are known (Xue \& Wang 1998; Wang \& Xue 2002; Wang \textit{et al.} 2008). Southwest China is the most important biodiversity hotspot worldwide (Myers \textit{et al.} 2000). However, our knowledge of the genus \textit{Fannia} in China, especially in Southwest China, is still far from adequate. In recent years, we have been engaged in taxonomic and faunistic studies of this group of flies in China and have found 17 new species (Wang \textit{et al.} 2006–2008).

\begin{align*}
\text{By\ studying specimens from Southwest China, we recognised two new species of the } F.\text{ posticata-group, and after a systematic study of related species we assigned } F.\text{ dasytophacela to this group on the basis of its morphological characters, especially the male genitalic structures of the holotype. To date, the } F.\text{ posticata-group comprises 21 species (Chillcott 1961a, 1961b; Kurahashi 1971), five of which occur in China. This paper reviews the world species of the } F.\text{ posticata-group. All known species are listed, two new species are described, } F.\text{ posticata is redescribed, and, to facilitate comparisons, the known species of the } F.\text{ posticata-group are keyed.} 
\end{align*}
Systematic account

*Fannia posticata*-group

**Fannia pretiosa**-group: Chillcott, 1961a: 142, 222.

**Fannia posticata**-group: Rozkošný et al., 1997: 49; Wang et al., 2006: 180.

For diagnosis and detailed descriptions of the male and female adults, see Wang et al. (2006: 180) and Chillcott (1961: 142).


**Distribution.** Palaearctic, Nearctic, and Australasian regions.

**Key to males of the known species of the *Fannia posticata*-group**

1. Hind fumur strongly arcuate .................................................. 2
   - Hind fumur developed normally ........................................... 6

2. Hind tibia with a complete ad row: *F. arcuata* Chillcott
   - Hind tibia with only 1 ad .................................................. 3

3. Abdomen and legs yellow; pra absent: *F. curvipes* Malloch
   - Abdomen and legs black or yellow, but not both together;
     pra present ................................................................. 4

4. Lateral part of abdomen yellow, legs entirely black; hind tibia with 4 or 5 av ........................................... 5
   - Abdomen with ground-colour black; hind tibia with 2 av ................................................................. 5

5. Haltere yellow; fore first tarsomere yellow .................................. 6
   - Haltere black at apex; fore first tarsomere black .......................... 7
   - Haltere yellow; fore first tarsomere yellow ............................... 7
   - Haltere at apex; fore first tarsomere yellow ............................... 7
   - Haltere at apex; fore first tarsomere yellow ............................... 7

6. Hind tibia at most with 1 ad .................................................. 7
   - Hind tibia with 2 or more ad ............................................. 18

7. Scutellum yellow at apex; abdomen and legs entirely yellow or at least partly yellow; pra 1 or 2 .................... 8
   - Scutellum entirely black; abdomen and legs entirely black or yellow, but not both together ...................... 10

8. Presutural acr triserial; apex of femora and most part of tibiae black ........................................... 9
   - Presutural acr biserial; femora and tibiae entirely yellow .................. 9

9. Hind tibia with 2 av; male cerci not swollen in distal part in ventral view, bacilliform process distinctly spiralled .................. 9
   - Hind tibia with 1 av; male cerci distinctly swollen in distal part in ventral view, bacilliform process long, slender and rod-like .................................................. 9

10. Legs entirely yellow or at least femora and tibiae yellow ................................................................. 11
   - Leg entirely black, at most knees brownish ......................... 12

11. Abdomen black, with bluish-grey pruinosity ............................... 12
   - Abdomen basally translucent yellow .................................. 13
   - Abdomen basally translucent yellow .................................. 13

12. Hind tibia with 1 av .................................................. 13
   - Hind tibia with 2–4 av ............................................. 15

13. Thorax and abdomen with yellowish-brown pruinosity; hind femur simple, with 4 moderate av in distal half and a group of loosely clustered pv in distal 1/4; mid femur with finer and sparser setae on av and pv surfaces ........................................... *F. norfolki* Pont
   - Thorax and abdomen with grey pruinosity; hind femur modified, with a number of stout spines along most of av surface and with numerous fine setae along pv surface; mid femur with dense and more spine-like setae on av and pv surfaces ........................................... *F. tunisiae* Pont

14. Frons broader, at narrowest point slightly narrower than first antennal flagellomere; eyes with short but distinct pubescence; frontal setae 5–8, stout; mid tibia with 2 pd; mid femur with dense av, in several rows; hind femur with the longest pv on 3rd quarter much longer than femoral width ........................................... *F. tasmaniae* Pont
   - Frons at narrowest point not as wide as first antennal flagellomere; eyes bare; frontal setae 12–14; mid tibia with 1 pd; mid femur with sparse av, in a single row; hind femur with the longest pv on 3rd quarter at most as long as femoral width ........................................... *F. howei* Pont

15. Pra 2 .................................................. 16
   - Pra 1 .................................................. 16

16. Hind femur distinctly swollen subapically, with a cluster of hairs on pv surface ........................................... 17
   - Hind femur not swollen subapically, without a cluster of hairs on pv surface ........................................... *F. davidianicornis* Wang, Zhang & Xue

17. Haltere yellow; fore tibia without pd and pv, mid tibia with the longest hairs on ventral surface as long as tibial width; scutum and abdominal tergites with bluish-grey pruinosity; parafacial about 1/3–2/5 as wide as width of first flagellomere at middle; male cerci broad at base ........................................... *F. dianensis* n. sp.
   - Haltere redish-brown; fore tibia with 2 pd and 4 pv, mid tibia with the longest hairs on ventral surface longer than tibial width; scutum and abdominal tergites shining black; parafacial about 1/2 as wide as width of first flagellomere at middle; male cerci slender at base ........................................... *F. daytophacela* Feng & Xue

18. Hind tibia at most with 5 av .................................................. 19
   - Hind tibia with about 10 long and fine av and numerous hair-like ventral and posteroventral setae ........................................... *F. tunisiae* Chillcott

19. Hind tibia with 3–5 av and 3–6 ad .................................. 20
   - Hind tibia with 2 av and 2 or 3 ad .............. *F. nigra* Malloch

20. Frontal setae 9; hind tibia with 3 or 4 ad; abdominal sternite 5 with sparse hairs; eyes bare .... *F. depressa* (Stein)
Catalogue of known Chinese species of the Fannia posticata-group and descriptions of two new taxa

Fannia dasytophacela Feng & Xue 2006

Fannia dasytophacela Feng & Xue 2006: 218.

Specimens examined. Holotype ♂, China, Sichuan: Mt. Erlang [29°48’ N, 102°12’ E], alt. 2740 m, 3.VII.1988, leg. Y. Feng.

Distribution. China (Sichuan).

Fannia davidianicornis Wang, Zhang & Xue 2006


Specimens examined. Holotype ♂, China, Xizang Autonomous Region: Milin County: Mt. Duoxiongla [29°3’N, 95°8’E], alt. 3600–4200m, 8.VIII.2003, leg. M.F. Wang; paratypes: 8 ♂♂, same data as holotype.

Distribution. China (Xizang Autonomous Region).

Fannia dianensis Wang & Zhang n. sp. (Figs 1–4)


Description. Male. Body length 6.5 mm. Eye bare, facets slightly enlarged on anterior margin in upper part; postocular setae in one row, upper 8–10 setae long, curved anteriorly, the others short; fronto-orbital plate and parafacial with greyish-silvery pruinosity; the median part of frons about as wide as or slightly narrower than the distance between two posterior ocelli; frontal vitta brown; frontal setae 15, nearly reaching ocellar triangle, orbital setae absent; parafacial bare and narrow, about 1/3–2/3 as wide as width of first flagellomere at middle; antenna black, first flagellomere 2.5 times as long as wide; arista slightly swollen at base, the longest hairs shorter than its basal width; epistoma slightly projecting to vibrissal angle, vibrissal angle behind frontal angle in profile; prementum with thin grey pruinosity; its length 3.0 times as long as its width; palpus black and slender, longer than prementum.

Thorax with ground-colour black, scutum mostly with dark brown pruinosity except for postpronotal lobe, lateral part of transverse suture, postalar lobe and scutoscutellar suture which are greyish-white pruinose; presutural acr biserial, only prescutellar pairs slightly stout, dc 2+3, ia 0+2, pta 2, the anterior one about 1/2 as long as posterior notopleural seta, notopleuron without setulae; basisternum, propcisternum, anepimeron, meron and katepimeron bare; katepisternal setae 1:1, katepisternum without ventral spines; spiracles brownish-yellow; calypters yellowish, the lower one distinctly projecting beyond upper one. Wing brownish; tegula black, basicosta brownish-yellow, costal spine inconspicuous; vein Sc curved bow-like; node of Rs bare on ventral and dorsal surfaces; vein M straight, veins R 4+5 and M conspicuously close to each other distally; crossveins without obvious cloud; haltere yellow. Legs black, except basal part of fore tibia which is brownish; fore tibia with 1 short ad, without p; mid coxa without any hooked spines or spine-like setae on lower and outer margins; mid femur with 6 sparse and long av in basal 3/5, av row comb-like in distal 2/5, ad row short and complete, only 4 long setae in distal part, curved posteriorly, pv row complete, p row distinctly long and stout; mid tibia slightly swollen in distal half, with 1 ad, 1 pd in distal half, with numerous hairs on ventral surface, the longest equal to tibial width; mid first tarsomere without basal tooth-like spines on ventral surface; hind coxa bare on posterior surface; hind trochanter with 4 long setae in a line on ventral surface; hind femur with a complete av row, long and stout, especially in distal part, from posterior to posteroventral surfaces with numerous rows of long and fine setae, each seta curved at apex, distal 1/3 of femur swollen on posteroventral surface, the swollen part with long and fine clustered setae, the longest about 1.5–2.0 times as long as femoral width; hind tibia with 1 av, 1 ad and 1 median d. Abdomen long, depressed and flattened, ground-colour black, with dense grey pollinosity; syntergite 1+2 to tergite 4 each with a triangular mark mediadally; tergite 5 with a dark median stripe; each tergite with long setae at lateral margin; sternite 1 with hairs.

Female. Unknown.

Distribution. China (Yunnan).

Remarks. This new species resembles F. dasytophacela but differs from it in having frons narrow, and frontal
setae 13–15; prementum with thin grey pruinosity, its length 3.0 times as long as its width; scutum mostly with dark brown pruinosity; haltere yellow; fore tibia without $p$; hind femur with rows of numerous long and fine setae from posterior to posteroventral surfaces, each seta curved at tip.

**Fannia posticata** (Meigen 1826)  
(Figs 5–7)

*Anthomyia* posticata Meigen 1826: 190.
*Homalomyia* pretiosa Schiner 1862: 654.
*Homalomyia* ruwii Rondani 1866: 126.

**Specimens examined.** 1 ♂, China, Heilongjiang; Ning’an County, 31.VII.1986, leg. C.Y. Cui; 1 ♂, China, Jilin: Mt. Changbai, alt. 900–1750 m, 11.VIII.2004, leg. C.T. Zhang.

**Description.** Male. Body length 4.5 mm. Eye bare, facets slightly enlarged on anterior margin in upper part; postocular setae in one row, short and uniform; fronto-orbital plate and parafacial with greyish-silvery pruinosity; frons at middle about as wide as the distance between two posterior ocelli, slightly narrower than or equal to width of antennal flagellomere; frontal vitta dark brown, linear at middle; frontal setae 7 or 8, long and strong, situated on lower 3/4 of frons, orbital setae absent; parafacial bare and narrow, about 1/3 as wide as width of first flagellomere at middle; antenna black, first flagellomere 2.5 times as long as wide; arista with the longest hair shorter than aristal width at base; epistoma not projecting to vibrissal angle, vibrissal angle behind frontal angle in profile; subvibrissal setulae in one row; gena with greyish-brown pruinosity, gena and genal dilation with black hairs, upper margin of gena without upcurved setae; proboscs moderately long, labella large, prementum with greyish-brown pruinosity, its length 2.0 times as long as its width; palpus black and claviform. Thorax mostly black, except postpronotal lobe, lateral postalar lobe and median trapeziform mark at middle; abdomen long, depressed and flattened, yellow in basal half, distal half of tergite 4 and tergite 5 black, each tergite with dense greyish-brown pollinosity; tergites 3 and 4 with an inverted trapeziform mark at middle; sternite 1 with hairs.

**Female.** Not known in China.

**Distribution.** China (Heilongjiang, Jilin); Japan, throughout Europe.

**Fannia punctifemoralis** Wang & Cheng n. sp.  
(Figs 8–10)

**Specimens examined.** Holotype ♂, China, Sichuan: Mt. Erlang [29°48’ N, 102°12’ E], alt. 1900–2930m, 3.VII.2006, leg. C.T. Zhang; paratype: 1 ♂, with same data as holotype. Both in the Institute of Entomology, Shenyang Normal University, Shenyang, China.

**Description.** Male. Body length 5.0–5.5 mm. Eye bare, facets slightly enlarged on anterior margin in upper part; postocular setae in one row, short and uniform; fronto-orbital plate and parafacial with greyish-silvery pruinosity; frons at middle about 2.0 times as wide as anterior ocellus, 3/4 of the distance between two posterior ocelli, 2/3–3/4 of width of first antennal flagellomere; frontal vitta black, disappear at narrowest point of frons; frontal setae 8 or 9, situated in lower 3/4 of frons, orbital setae absent; parafacial bare and narrow, about half as wide as width of first flagellomere at middle; antenna black except bases of scape, first flagellomere and arista which are yellow, first flagellomere 2.5 times as long as wide; arista swollen at base, the longest hair about as long as width of arista base; epistoma not projecting to vibrissal angle, vibrissal angle behind frontal angle in profile; subvibrissal setae in one row; gena with thin greyish-brown pruinosity, gena and genal dilation with black hairs, upper margin of gena without upcurved setae; prementum with greyish-yellow pruinosity, its length 2.5 times as long as its width; palpus black, claviform, about as long as prementum. Thorax with ground-colour black, except scutellar apex which is yellow, scutum with greyish-brown pruinosity, without distinct stripes; presutural acr biserial, the distance between two acr rows about 1/2 the distance between acr row and dc row, dc 2+3, ia 0+2, pta 2, the anterior one ia 1/2 as long as posterior notopleural seta, notopleuron without setulae; basisternum, proepisternum, anepimeron, meron and katepimeron bare; katepisternal setae 1:1, katepistemum without ventral spines; anterior spiracle yellowish, posterior one brown; calypters yellow, the lower one slightly projecting beyond upper one. Wing brownish; veins brown; tegula brown, basicosta yellowish, costal spine inconspicuous; vein S5 curved bow-like; node of Rs bare on ventral and dorsal surfaces; vein M straight, veins R$_{4,5}$ and M parallel to each other distally; crossoine without obvious cloud; haltere yellow. Legs yellow, tarsi black; fore coxa without short anterior spines on ventral surface; fore femur with complete pv row, sparse and long; fore tibia without ad and median $p$; mid coxa without any hooked spines or spine-like setae on lower and outer margins; mid femur with a sparse and long av row in basal part, becoming gradually shorter towards apex, comb-like in distal 1/3, pv row complete, short and stout, $p$ row long and fine, the setae stout in distal 1/3; mid tibia distinctly swollen in distal half, with 1 ad, 1 pd in distal part, numerous fine hairs on ventral surface, the longest equal to tibial width; mid first tarsomere without basal tooth-like spines on ventral surface; hind coxa bare on posterior surface; hind femur with a complete av row, short and stout, without distinct pv row, with only numerous long, fine and curved pv in distal 1/3; hind tibia with 1 av, 1 ad and 1 median $d$. Abdomen long, depressed and flattened, yellow in basal half, distal half of tergite 4 and tergite 5 black, each tergite with dense greyish-brown pollinosity; tergites 3 and 4 with an inverted trapeziform mark at middle; sternite 1 with hairs.

**Female.** Not known in China.

**Distribution.** China (Heilongjiang, Jilin); Japan, throughout Europe.
row, $dc\ 2+3$, $ia\ 0+2$, $pra\ 2$, the longest one slightly less than 1/2 as long as posterior notopleural seta, notopleuron without setulae; basisternum, proposternum, anepimeron, meron and katepimeron bare; katepisternal setae 1:1, katepisternum without ventral spines; anterior spiracle yellowish, posterior one brown; calypters white, lower one projecting beyond upper one. Wing brownish; veins brown; wing-base yellowish, tegula dark brown, basisterna yellow, costal spine inconspicuous; vein Sc curved bow-like; node of Rs bare on ventral and dorsal surfaces; vein M straight, veins $R_s$, and $M$ parallel to each other distally; crossovis without obvious cloud; haltere yellow. Legs yellow, except femoral tips, most of tibiae and tarsi which are black; fore coxa without short anterior spines on ventral surface; fore femur with a complete pv row, becoming fine in basal part, $ad$ row complete; fore tibia without $ad$ and median $p$; mid coxa without any hooked spines or spine-like setae on lower and outer margins; mid femur with complete av row, sparse and long in basal part, becoming gradually shorter and denser towards apex, comb-like in apical part, a row short, $pv$ row complete, short and stout, only 1 basal seta longish, $p$ row complete and with 4 or 5 stout setae in distal part; mid tibia distinctly swollen in distal half, with 1 $ad$, 1 $pd$ in distal half, with numerous hairs on ventral surface, the longest one equal to tibial width; mid first tarsomere without basal tooth-like spines on ventral surface; hind coxa bare on posterior surface; hind femur with complete av row, only 2 or 3 stout setae in distal part, without a distinct pv row, only with numerous long and fine $p$, becoming one row in distal half; hind tibia with 2 (aberrantly 3) av, 1 $ad$, 1 median $d$ and numerous short erect setae in median part of posterior surface. Abdomen long, depressed and flattened, syntergite 1+2, tergite 3 and basal half of tergite 4 yellow and translucent, distal half of tergite 4 and tergite 5 black; each tergite with dense whitish-grey pollinosity; tergites 2 to 4 each with an inverted trapeziform mark at middle, tergite 5 with a median stripe nearly reaching posterior margin; sternite 1 broad, with 2 or 3 setulae on lateral margin.

**Female.** Unknown.

**Distribution.** China (Sichuan).

**Remarks.** This new species resembles *F. penepretiosa* but differs from it in having femoral tips black, tibiae mostly black; presutural acr triserial; distal half of abdominal tergite 4 and tergite 5 black.

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