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Studies on Fanniidae (Diptera) from the Oriental Region

I. Three New Species of the *Fannia mollissima* Subgroup from Nepal*

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Abstract Three new species of the genus *Fannia* are described from Nepal. These species belong to the *mollissima* subgroup (PONT, 1965) of the *serena* group of CHILLCOTT (1961). A key to the species (male) belonging to the *mollissima* subgroup is given.

Key words: *Fannia*; *mollissima* subgroup; Fanniidae; new species; Nepal.

Two genera of Fanniidae are known from the Oriental Region, *Euryomma* STEIN with 1 species and *Fannia* R.-D. with 29 species. As the Fanniidae of this region are still very poorly known, it is expected that many more species will be found.

In this paper, three new species of the genus *Fannia* occurring in Nepal are described.

Fannia nepalensis sp. nov.

(Figs. 1-9)

Male. Head. Eyes with short and sparse hairs, the hairs shorter than diameter of anterior ocellus; about twice as deep as long. Occipital setae long, irregular in length. Upper postoccipital setae sparse; biserial, but sometimes uniserial near vertex. Frontal setae 8-11, with some interstitials; orbital seta stout, reclinate. Frons arched, at narrowest point narrower than width of 3rd antennal segment. Ground colour of parafacialia, parafrontalia and frontal vitta black. Parafrontalia brownish-grey pollinose; parafacialia mainly grey, bare, broad, at lunula about equal to width of 3rd antennal segment. Frontal vitta above lunula broadened and swollen. Antennae black; brownish-grey subpubescent; 2nd segment with a long seta among some tiny setulae; 3rd segment 1.5 times as long as wide. Arista black, weakly pubescent, 1.5 times as long as 3rd antennal segment, conspicuously thickened on basal third. Epistoma projecting beyond vibrissal angle. Vibrissal angle beyond the anterior level of frons, sometimes on it. Ptilinal suture grooved deeply. Proboscis black; prementum weakly sclerotized, distinctly pollinose, 2.5 times as long as wide. Palpi filiform, shorter than pre-

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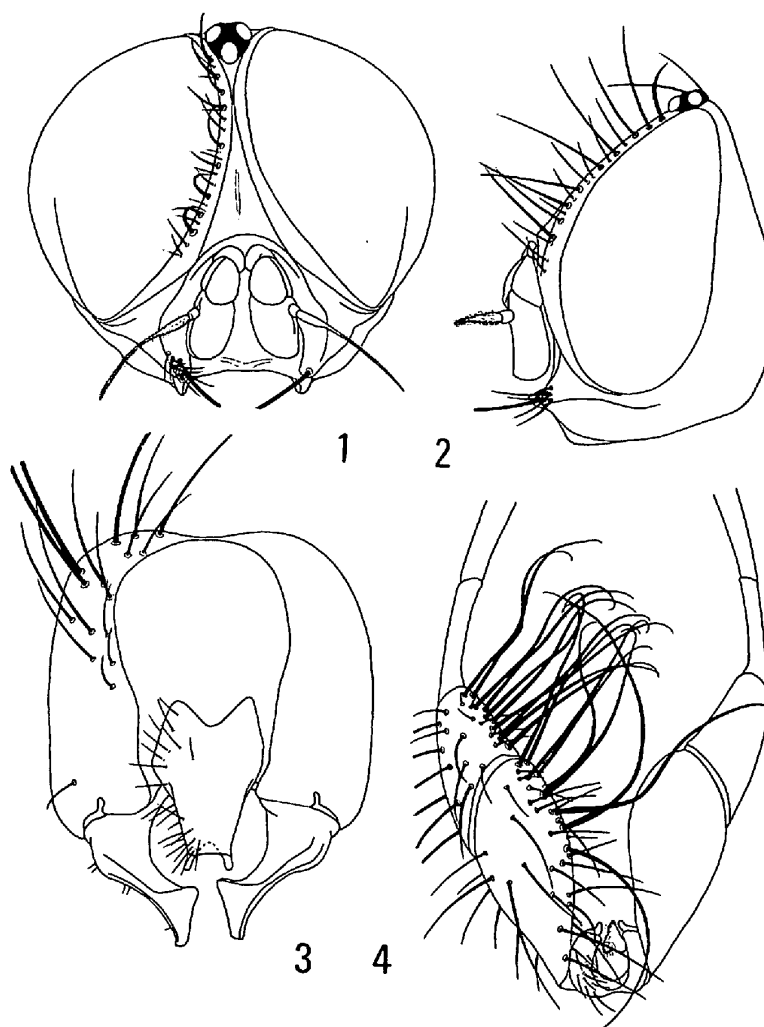
mentum, compressed laterally (Figs. 1–2).

Thorax. Ground colour black, with thin brownish dust; on humeri and postalar area greyish-brown dusted; with four inconspicuous brown stripes. *Pra* 2–3, well-developed. Propleural depression bare, with 2 setae on ridge beneath. 2 strong prostigmatal setae present among some fine and long setulae. *Prst acr* biserial; *post acr* triserial, median row weak and irregular. *Stpl* 1 : 1, with some fine setulae between them. Scutellum black, greyish-brown dusted, bare on sides and beneath.

Wings. Wing membrane faintly smoky, veins pale brown. Costal spine short, but distinct; costa with short and stout setulae amongst the normal setulae of the *ad* row. Squamae pale yellow, with yellow margin and a long fringe of hairs; lower one linear. Halteres brownish-yellow.

Abdomen. Spatulate, entirely black, brownish-grey dusted. With a triangular mark on tergites 1+2, 3 and 4, and a median stripe on tergite 5. Lateral margins of 4th and 5th tergites strongly rolled inwards. 5th tergite elongated on ν surface of abdomen. Fourth tergite with 5–6 pairs of sinuous, very long and thick setae among the short and sparse setulae along the lateral margin on ν surface of abdomen. Fifth tergite with 2–4 paired, sinuous long and strong setae along the lateral margin, followed by 2–4 unpaired, sinuous and very long setae. These characteristic setae on 4th and 5th tergites crossed over ν surface of abdomen, and arranged regularly (Fig. 4).

Legs. All the legs entirely black. Fore coxa without ν spine. Fore femur setulose on *av* surface; with pluriserial row of *p* setae, and with a complete row of strong *pv* setae and a row of long *pd* setae. Fore tibia sometimes with an indistinct *ad* seta. Mid femur becoming gradually thicker apicad, but on apical fourth thinned on ν surface; with a row of 8–10 long and strong *av* setae on basal two-thirds, beyond and slightly apart from them a row of 5–7 spine-like *av* setae which are close-set and slightly bent at tips, and then bare except some preapical tiny setulae; with a row of long *pv* setae on basal third, followed by biserial *pv* setae, then a short gap, and with 4–6 long *pv* setae, and again a gap, then with 4–5 long and fine setae preapically. Mid tibia modified on ν surface, *av* surface excised in basal quarter and just beyond middle, and then somewhat swollen on apical third; with a narrow glossy zone on basal half, changing from *av* surface to ν surface towards apex; bare on *av* excision; ν surface on basal third with short and sparse setulae, and with a ν and *pv* mat of short and erect setulae on apical two-thirds, the hairs of the mat not so dense, slightly shorter than the tibial diameter; with 1 *ad* and 1 *pd*. Hind coxa bare on inner posterior margin. Hind femur with a row of 5–6 very long and strong *a* setae among long setulae, this row gradually approaching *ad* surface; ν surface setulose on basal third; with a row of very strong and widely-spaced *av* setae, the basal ones especially strong; with a few fine *pv* setae at base, followed by 3–4 long spine-like *p* to *pv* setae on basal fourth, and then after a gap with 1–2 long spine-like *p* to *pv* setae medially, and then a short gap, then with 2–3 long



Figs. 1-4. *Fannia nepalensis* sp. nov. (paratype). — 1, Head, frontal aspect; 2, ditto, lateral aspect; 3, hypopygium, caudo-ventral aspect; 4, abdomen, ventral aspect.

spine-like p to pv setae, followed by 1-2 fine setulae, and then broadly bare, but setulose preapically; with a long and strong d preapically. Hind tibia constricted and slightly bent just beyond middle on a surface, and with a clump of 4-5 spine-like a and ad setae at this point; apical half of av , a and ad surfaces with close-set, short and stout setulae; with a very long thornlike submedian av , the seta gradually curved apicad, about equal to half of tibial length, with a median d seta (Figs. 7-9).

Hypopygium. Cercal plate short, tapering basad, bifurcate and curved inwards at apex. Surstylus short, broad in lateral aspect, the apex widened, broadly attached basally. 5th sternite weakly sclerotized, with several short sparse setulae, 1.5 times as broad as long, with a pair of weak projections on posterior margin,

and with an indented margin between the projections (Figs. 3, 5 and 6).

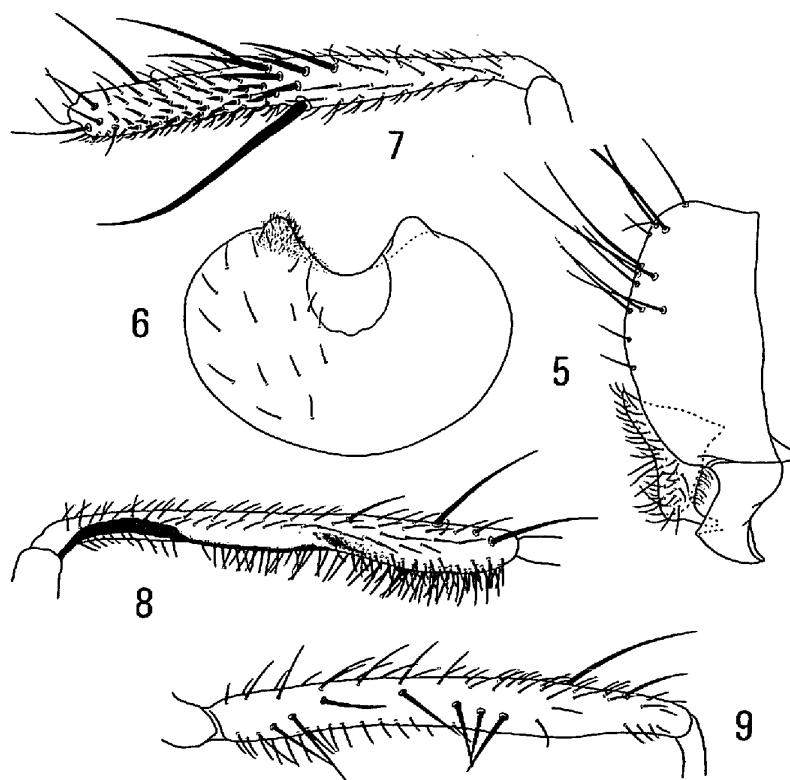
Female. Unknown.

Length. Male, 4.9–5.6 mm.

Type series. Holotype: ♂, Thudam (3,500 m.), Nepal, 24 June 1972 (J. EMOTO); paratypes: 1 ♂, Thudam (3,500 m.), Nepal, 24 June 1972 (J. TENJING); 14 ♂, NE of Thudam (4,000 m.), Nepal, 28 June 1972 (J. EMOTO); 2 ♂, Thudam (3,500 m.), Nepal, 2 July 1972 (H. SHIMA); 3 ♂, Thudam–Tanga La (4,700 m.), Nepal, 5 July 1972 (H. SHIMA); 3 ♂, Thudam (3,500 m.), Nepal, 8 July 1972 (H. SHIMA). Type series, including the holotype, are in the Biological Laboratory, College of General Education, Kyushu University, Japan. One male paratype is deposited in the Department of Entomology, British Museum (Natural History), London.

Distribution. Nepal.

Remarks. Most specimens were collected by Malaise trap. This new species seems to be closely allied to *Fannia mollissima* (HALIDAY, 1840), but *F. mollissima* can be distinguished from this new species by the following features: *Acr* triserial throughout; membrane and veins of wing paler; hind tibia with 1 *av* of medium



Figs. 5–9. *Fannia nepalensis* sp. nov. (paratype). — 5, Hypopygium, lateral aspect; 6, 5th sternite; 7, hind tibia, anterior aspect; 8, mid tibia, anterior aspect; 9, hind femur, postero-ventral aspect.

size, and 1 *ad*; each lateral margin of 3rd and 4th tergites with fine and numerous setulae curled over at the tips, and lateral margin of 5th tergite with many long and strong setae in a pluriserial row; 5th sternite without projections on hind margin.

Fannia alta sp. nov.

(Figs. 10–14)

Male. Head. Eyes with sparse but distinct hairs, the hairs shorter than diameter of anterior ocellus; twice as deep as long. Frons strongly arched, at narrowest point slightly narrower than width of 3rd antennal segment. Para-facialia and parafrontalia standing almost vertically. One long and one short occipital setae arranged alternately. Upper postoccipital setae irregularly biserial. Ground colour of parafrontalia, parafacialia and frontal vitta black. Frontal setae 9–10, with several interstitials. Parafrontalia narrow, greyish-brown pollinose. Parafacialia bare, greyish-brown pollinose, at lunula two-thirds as wide as 3rd antennal segment. Frontal vitta wide and distinct throughout, brownish-grey pollinose, slightly narrower than width of ocellar triangle. Facial ridge somewhat expanded towards outside. The plates of the clypeus and facial ridge raised forwards. Antennae black, 2nd segment with 2 long setae among the some minute setulae; 3rd segment 1.5 times as wide as long; arista weakly pubescent, twice as long as length of 3rd antennal segment, conspicuously thickened on basal fourth. Oral margin distinctly projecting beyond the vibrissal angle. Vibrissal angle well in front of anterior level of frons. Proboscis black, elongated; prementum weakly sclerotized, slender. Palpi filiform, laterally compressed (Figs. 10 and 11).

Thorax. Ground colour black, very thinly brownish-grey dusted; with obscure vittae along the *acr* and *dc* rows. Humerus and postalar area brownish-grey dusted. *Prst acr* biserial; *post acr* triserial, median row irregular and weak. *Pra* 2, among a few long setulae, but clearly distinguishable. Propleural depression bare, with 2 setae on ridge beneath. About 12 prostigmatal setae present. *Stp* 1 : 1, anterior one weaker. Scutellum black; greyish-brown dusted; bare on sides and beneath.

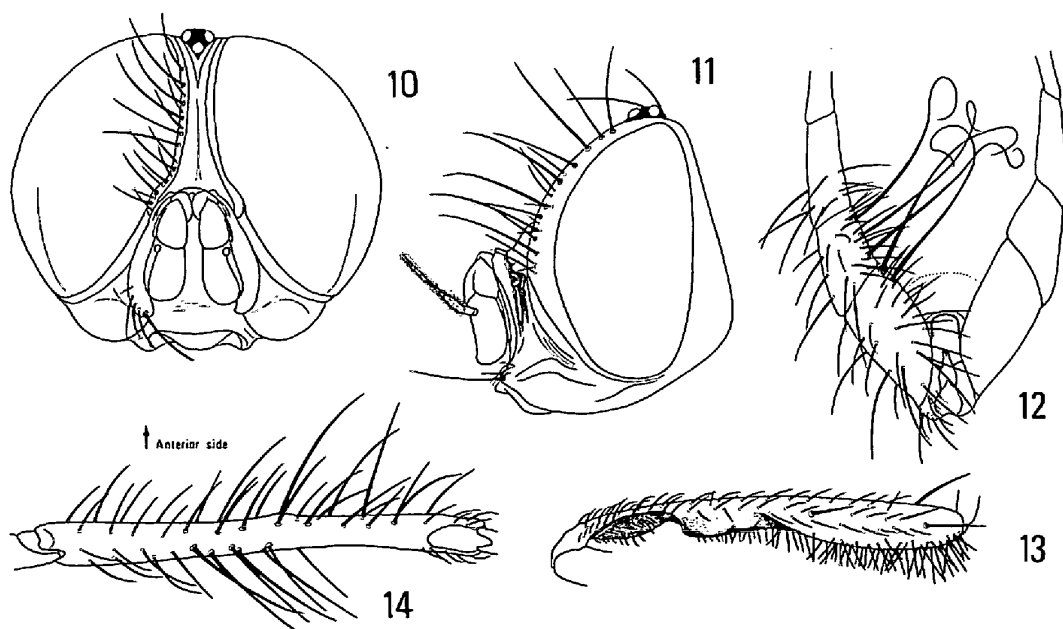
Wings. Wing membrane slightly smoky. Veins brown, paler basad. Costal spine inconspicuous. Costa with short and stout setulae amongst the normal setulae of *ad* row. Squamae smoky, with a long fringe of brown hairs; lower one linear. Halteres yellow.

Abdomen. Spatulate. Ground colour black, thinly brownish dusted. Each tergite with a black triangular mark. Along the lateral margin of 4th tergite on *v* surface of abdomen with 3 very long and sinuous setae among the short and sparse setulae, and with 2 long and sinuous setae along the lateral margin of 5th tergite among the short and sparse setae, these long characteristic setae crossed over the *v* surface of abdomen, and forming a row. Fifth tergite somewhat elongated on *v*

surface of abdomen (Fig. 12).

Legs. Entirely black. Fore femur setulose on *av* surface; with pluriserial rows of *p*, *pv* and *pd* setae, the setae curled at tips. Fore tibia with one short but distinct *ad* seta. Mid femur becoming slightly thicker apicad, and then with a preapical *v* excision; on basal half with a row of 6 long and widely-spaced *av* setae, immediately followed by a row of 4 close-set, spine-like *av* setae, and then with a clump of 7 short spine-like setae, then bare on preapical *v* excision except for a few fine setulae near apex; with incomplete biserial rows of strong *pv* setae (uniserial at both ends of the rows). Mid tibia strongly modified on *v* surface; *av* surface with a glossy deep excision on basal fourth, and then with a glossy *v* convexity, followed by a concave area on *av* surface medially, then weakly swollen on apical half; on *av* excision and *v* convexity with short setulae, median *av* excision bare, and with a *v* mat of setulae on apical half, the setulae about equal to tibial diameter; with 1 *ad* and 1 *pd* seta. Hind coxa bare on inner posterior margin. Hind femur with a row of *av*, the setae stronger apicad; with a row of 4 long and strong *a* setae on apical half, this row approaching *ad* surface; on *p* and *pv* surfaces with long setulae on basal third; with biserial rows of 6–7 close-set, long, spine-like *pv* setae medially, and then bare, followed by some tiny setulae preapically; with a row of long and fine *pd* hairs on basal half. Hind tibia with 1 *av*, 1 *ad* and 1 *d* seta (Figs. 13 and 14).

Hypopygium. Not dissected.



Figs. 10–14. *Fannia alta* sp. nov. (holotype). — 10, Head, frontal aspect; 11, ditto, lateral aspect; 12, abdomen, ventral aspect; 13, mid tibia, anterior aspect; 14, hind femur, ventral aspect.

Female. Unknown.

Length. Male, 4.8 mm.

Holotype. ♂, Thudam-Tanga La (4,700 m.), Nepal, 5 July 1972 (H. SHIMA). The holotype is in the Biological Laboratory, College of General Education, Kyushu University, Japan.

Distribution. Nepal.

Remarks. This species is closely allied to *F. mollissima* or *F. nepalensis*, but *F. mollissima* differs from this new species by the following characteristics: eyes bare; *acr* triserial throughout; membrane and veins of wing paler; squamae yellowish; 3rd and 4th tergites on lateral margin with long hairs curled over at the tips, and 5th tergite with rather long, dense and fine setae along the margin.

F. nepalensis differs from this new species in the following respects: Squamae yellowish; frons less projecting than in *F. alta*; hind femur bare on *pv* surface before middle; hind tibia with very long *av*; with some spine-like *a* and *ad*, and with a few fine and erect *pd* stulae; 4th and 5th tergites with duplicated long and strong setae along the lateral margins.

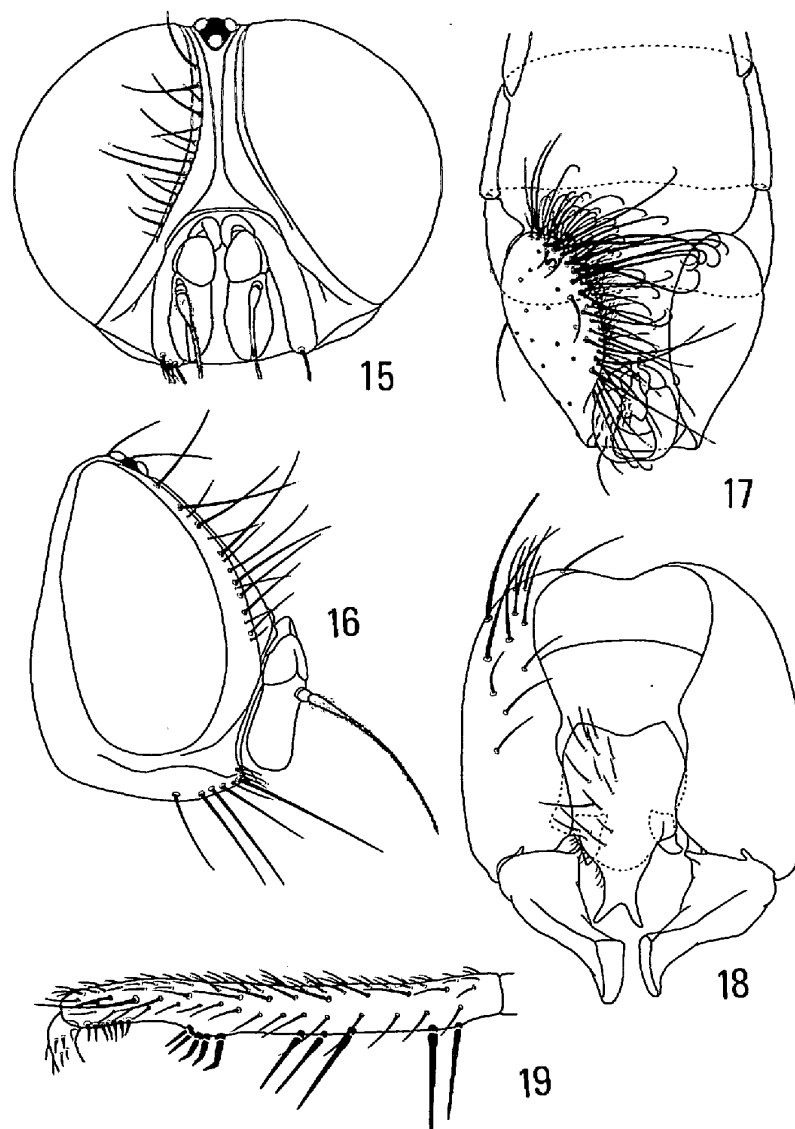
In dorsal view, the abdomen of *F. alta* hardly differs from that of *F. mollissima* or *F. nepalensis* in appearance.

Fannia himalayana sp. nov.

(Figs. 15–23)

Male. *Head*. Eyes bare, twice as deep as long. Occipitals with one long and one short arranged alternately. Upper postoccipital setae irregularly biserial. Frons arched, wide, at narrowest point wider than width of 3rd antennal segment. Ground colour of parafrontalia, frontal vitta and parafacialia black, brownish-grey pollinose. Parafacialia and parafrontalia rising almost vertically. Parafrontalia narrow. Frontal setae 10–12, with a few interstitials. Frontal vitta at narrowest point equal to width of ocellar triangle. Parafacialia bare, at lunula equal to width of 3rd antennal segment. Antennae black, 3rd antennal segment twice as long as wide. Arista 2.5 times as long as 3rd antennal segment; short pubescent, the hairs shorter than its basal diameter; conspicuously thickened in basal sixth. Genae with a row of stronger setae among short and fine setulae. Epistoma projecting, but not protruding beyond the vibrissal angle. Vibrissal angle behind anterior level of frons. Proboscis dark reddish-brown; prementum thinly dusted, weakly sclerotized, 2.5 times as long as wide. Palpi filiform, laterally compressed (Figs. 15–16).

Thorax. Ground colour black, brownish-grey dusted. Humeri and postalar area with thin light brown dust. Vittae on dorsum obscure. *Prst acr* biserial; *post acr* triserial, median row weak. *Pra* 2, strong. *Stpl* 1 : 1, with a few fine setulae between them. Propleural depression bare; with 2 strong setae on ridge beneath. One strong prostigmatal seta present among several fine and long setulae.



Figs. 15–19. *Fannia himalayana* sp. nov. (paratype). — 15, Head, frontal aspect; 16, ditto, lateral aspect; 17, abdomen, ventral aspect; 18, hypopygium, caudo-ventral aspect; 19, mid femur, anterior aspect.

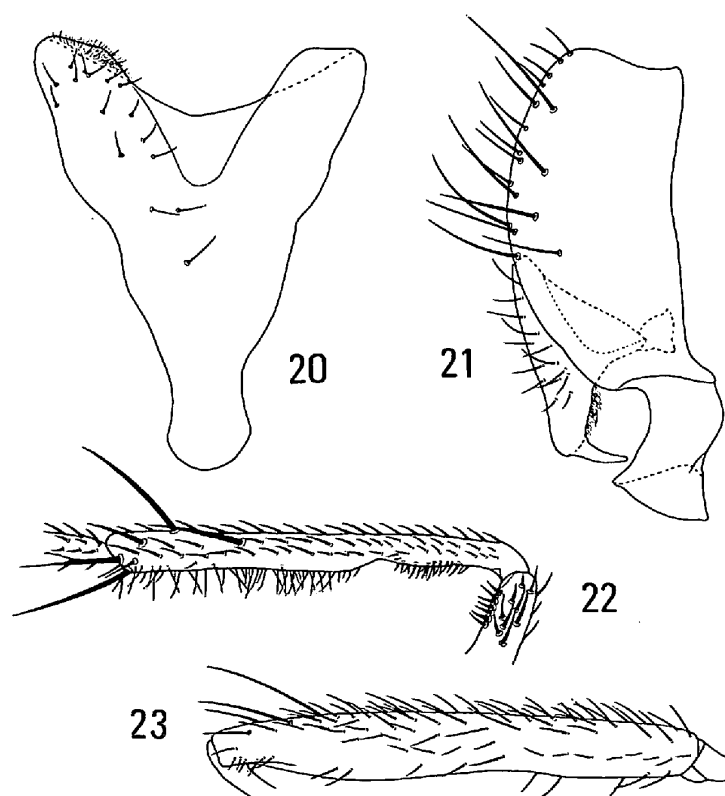
Scutellum black, bare on sides and beneath.

Wings. Wing membrane clear. Veins brownish-yellow. Costa with stronger and stouter setulae among the normal setulae of the *ad* row. Costal spine long, conspicuous. Squamae pale yellow, with a long fringe of yellow hairs; lower one linear. Halteres yellow.

Abdomen. Spatulate. Some areas of the tergites 1+2, 3 and 4 obscurely yellow, and with median T-shaped black markings on each tergite. Lateral margin of 5th tergite elongated and rolled inwards on *v* surface of abdomen. 5th tergite

with many long and strong setae along the lateral margin, many of those on the anterior part of the margin curled at tips, and crossed over the v surface of abdomen; and with the narrow zone along the margin covered with short and fine setulae (Fig.17).

Legs. Black, including the knees. Fore femur setulose on av surface; with pluriserial rows of long setae on pd , p and pv surfaces. Fore tibia without median or submedian setae. Mid femur of uniform width on basal two-thirds, and then with a weak v swelling, followed by an abrupt constriction preapically; with 1–2 long spine-like av sub-basally, and then a gap, followed by 3–4 spine-like av setae, and again a gap, followed by 4–5 close-set, short and thick av setae on the v swelling, some of them hooked at tips, and then a gap, and with a preapical comb; with a row of long pv setae on basal two-thirds, the pre-median one of this series especially strong; with 2 very long and strong p setae preapically; on pv surface with 1–2 sub-basal pv , and a short gap, and then with a row of long pv , followed by a clump of many pv setae on the small v swelling, and then a gap, and with a preapical comb. Mid tibia modified on v surface, with a weak v swelling in basal third, and then with v convexity pre-medially, followed by a long av excision on median and submedian part; bare on v convexity and ad excision, otherwise with a



Figs. 20–23. *Fannia himalayana* sp. nov. (paratype). — 20, 5th sternite; 21, hypopygium, lateral aspect; 22, mid tibia, anterior aspect; 23, hind femur, postero-ventral aspect.

pv and *v* mat of short setulae; with 1 *ad* and 1 *pd*. Hind coxa bare on inner posterior margin. Hind femur sparsely setulose on *pv* surface; with 2 long and strong *a* setae sub-basally; with a row of widely-spaced *av* setae on basal two-thirds; setulose on basal fourth of *v* surface; with long and fine hairs on *p* and *pd* surfaces on basal third. Hind tibia with 2 *av*, 1 *ad* and 1 median *d* seta (Figs. 19, 22 and 23).

Hypopygium. 5th sternite weakly sclerotized; long, about 1.5 times as long as wide; hind margin indented, and with dense, fine and minute setulae on each side of hind margin; with fine sparse setulae on the disc. Cercal plate short, tapering apicad, the tips curved inwards at apex. Bacilliform process present, small but distinct, triangular. Surstylus short, broad, somewhat expanded apically (Figs. 18, 20 and 21).

Female. Unknown.

Length. Male, 4.5–4.7 mm.

Holotype: ♂, Thudam (3,500 m.), Nepal, 8 July 1972 (H. SHIMA); *paratype*, 1 ♂, same data as the holotype. The type series are in the Biological Laboratory, College of General Education, Kyushu University, Japan.

Distribution. Nepal.

Remarks. The natural colour of abdomen cannot be observed, because the abdomen in both specimens was heavily greased. After the paratype was soaked in methyl cellosolve and xylene, it was dried, and then the colour was deduced. The pale yellow pattern appeared obscurely on tergites 1+2 and 3. It is possible that this portion is translucent yellow. Also, bright greyish dust appeared on each tergite. This species may have the abdomen with obscure markings.

This species seems to be very closely allied to *F. burmana* Pont, 1965, but *F. burmana* differs from this new species by the following features: eyes with very short sparse hairs; mid femur with 10–12 stout close-set spines on *av* surface, the basal two usually much stronger and set apart from the rest of the row; *pv* surface of hind femur bare except for about 4 more erect fine setulae in basal third; costal spine inconspicuous; wings conspicuously smoky and veins brown; cercal plate without bacilliform process.

Eight species belonging to the *mollissima* subgroup of PONT (1965) within the *serena* group of CHILLCOTT (1960) are known: *F. mollissima* (HALIDAY, 1840) and *F. subpellucens* (ZETTERSTEDT, 1845) from Holarctic Region, *F. supergressa* (HENNIG, 1956) from Palaearctic Region, *F. burmana* PONT, 1965. *F. ctenophora* (FAN, 1974), *F. nepalensis* sp. nov., *F. alta* sp. nov. and *F. himalayana* sp. nov. from Oriental Region.

No species of the *mollissima* subgroup are known at all from Ethiopian, Australian and Neotropical Regions.

A key to the species of the *mollissima* subgroup is given as follows. The parts about *F. supergressa*, *F. burmana* and *F. ctenophora* in this key are founded on the description by HENNIG (1956), PONT (1965) and FAN (1974), respectively.

Key to the Species of the *mollissima* Subgroup

(male)

1. Tergite 5 with dense, short and fine setulae on lateral margin *subpellucens* ZETT.
- Tergite 5 with some long and thick setae on lateral margin 2
2. Tergite 4 with long setae on lateral margin, the setae crossed over the ventral side of abdomen 3
- Tergite 4 with the setae of medium size on lateral margin 6
3. Basal segment of abdomen yellowish *ctenophora* FAN
- Abdomen entirely black 4
4. Hind tibia with a very long thornlike *av* of about equal to half of tibial length *nepalensis* sp. nov.
- Hind tibia with a *av* of medium size 5
5. Tergite 5 with 2 long and sinuous setae among short and sparse setae *alta* sp. nov.
- Tergite 5 with many long and sinuous setae among many long and slender setae *mollissima* HAL.
6. Tergite 5 elongated on ventral side of abdomen, reaching beyond anterior margin of tergite 4 *supergressa* HENNIG
- Tergite 5 somewhat elongated, but not reaching the anterior margin of tergite 4 7
7. *Pv* surface of hind femur bare except for about 4 more erect fine setulae in basal third; *av* surface of mid femur with about 10–12 stout close-set spines, the basal two usually much strong and set apart from the rest of the row; eyes with very short sparse hairs *burmana* PONT
- *Pv* surface of hind femur setulose sparsely; *av* surface of mid femur with 1–2 long spines sub-basally, and then gap, followed by 3–4 spines, and again a gap, followed by 4–5 closed-set, short and stout spines, and then a gap, and with a preapical comb; eyes bare *himalayana* sp. nov.

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