

Family Drosophilidae (Insecta : Diptera) in Kumaon Region, India, with the Description of one New Species and Three New Records

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Three Text-Figures

ABSTRACT

An account is given of 16 species exclusive of the genus *Drosophila*, viz., *Leucophenga*, *Zaprionus*, *Scaptodrosophila*, *Lissocephala*, *Scaptomyza*, *Amiota*, *Gitona*, *Paraleucophenga*, *Dettopsomyia* and *Stegana* of the family *Drosophilidae* collected from the Kumaon region from July

1996 to April 1999. *Stegana (Steganina) nainitalensis* is described as a new species and *Scaptodrosophila actinia*, *Leucophenga albiceps* and *Dettopsomyia nigrovittata* is recorded for the first time from India.

KEYWORDS : *Stegana*, Kumaon, new records, new species.

INTRODUCTION

Our previous studies on the Drosophilids of Kumaon region have yielded interesting results (Singh and Bhatt, 1988; Singh and Negi, 1989, 1992, 1995; Singh and Dash, 1993, 1998) though many areas remain uncovered from the above point of view. The Kumaon region, a wild hilly area is located at an elevation of range from 3022 ft. (975 mts.) to 6008 ft. (1938 mts.) from the sea level on the northeast periphery of the state of Uttar Pradesh. This region includes six border districts of the state viz., Nainital, Pithoragarh, Almora, Udham Singh Nagar, Champawat and Bageshwar. The area is characterized by having dense evergreen coniferous, deciduous and mixed forest with medium to very steep slopes and extremely moist conditions due to heavy rain fall. This paper embodies the results of several surveys undertaken in Kumaon region, India from July 1996 to April 1999. The genus *Drosophila* has been excluded from this communication, because an account of this genus has already been published in our previous paper Singh and Dash (1998). Text-fig.1 shows the collection localities for the collection of Drosophilidae.

In this paper we adopt the revised classification and terminology by Grimaldi (1990), Zhang and Toda (1992) respectively.

MATERIALS AND METHODS

The Drosophilid flies were collected during different seasons from July 1996 to April 1999. The flies were collected at several collecting stations in Kumaon region by different trapping methods as well as by (i) sweeping through undergrowth or above debris on the forest floor; (ii) sweeping above rotting native fruits and artificially yeasted fruits baits; and (iii) from fungi growing on decaying logs.

OBSERVATIONS

Taxonomic Account

Genus *Scaptodrosophila* Duda

1. *Scaptodrosophila coracina* Kikkawa and Peng

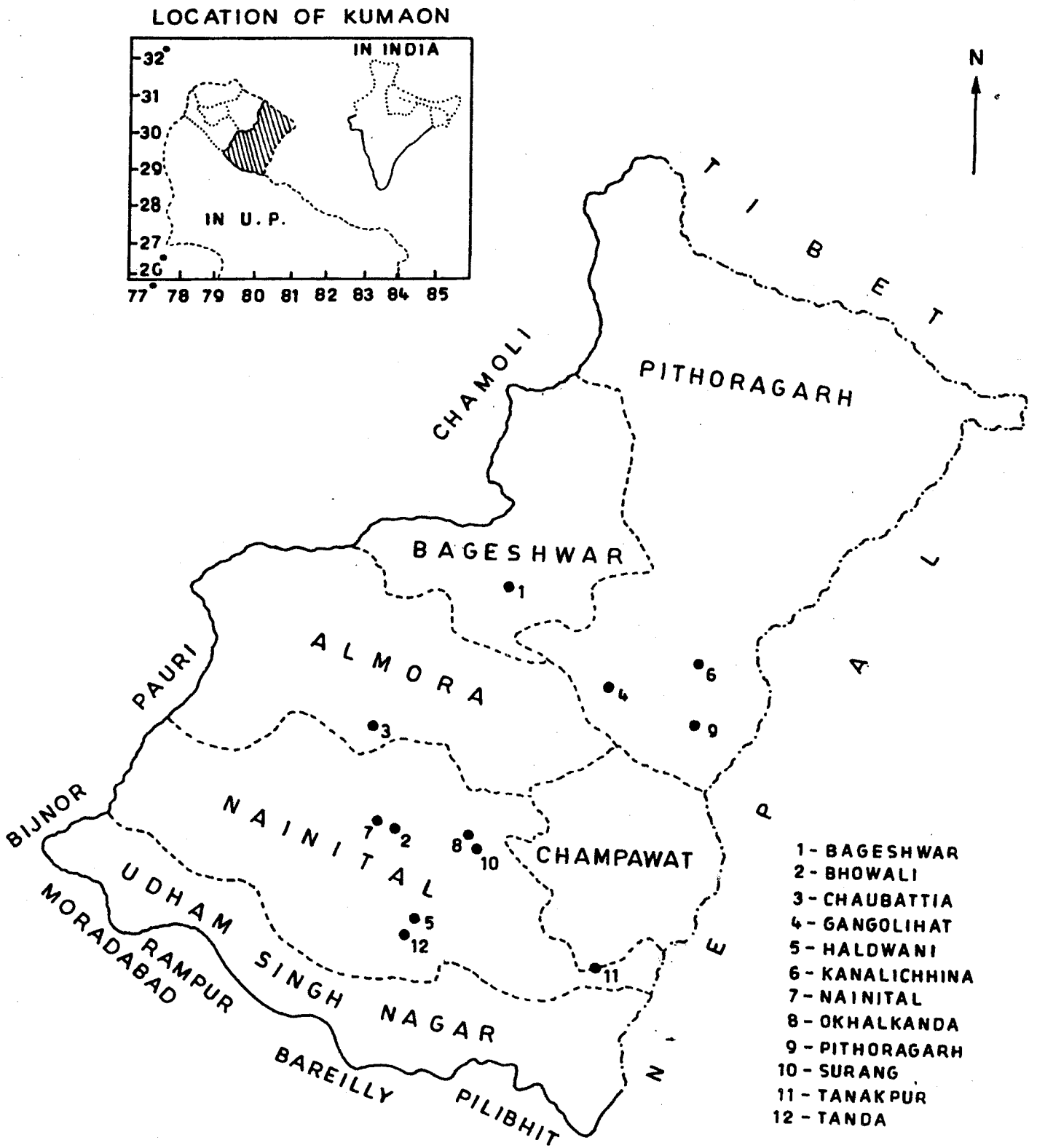
Specimens examined : 85♂, 70♀: India : Uttar Pradesh: Nainital district, Surang, 19. VII. 1996. Coll. Singh and Fartyal.

Distribution : India, China, Japan and Borneo. (Text. Fig.1)

2. *Scaptodrosophila chandraprabhiana* Gupta and Ray-Chaudhuri

Specimens examined: 35♂, 25♀: India: Uttar Pradesh: Bageshwar district, Bageshwar, 10. VII. 1997; 80♂, 75♀,

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Text-Fig. 1. Map of Kumaon region showing collection localities of Drosophilidae.

Nainital district, Khansu, 19. VIII. 1998. Coll. Singh and Fartyal.

Distribution : India.

3. *Scaptodrosophila hirsuata* Singh and Dash

Specimens examined : 25♂, 20♀: India: Uttar Pradesh: Pithoragarh district, Gangolihat, 20. VII. 1996; 25♂, 20♀, Nainital district, Tanakpur, 15. VIII. 1997. Coll. Singh and Fartyal.

Distribution : India.

4. *Scaptodrosophila actinia* Okada,

5. *Scaptodrosophila actinia* Okada 1991, Kontyu 56: 48-61.

Male and Female : Blackish brown. Mean body length: males (n=4) 2.20mm; females (n=3) 2.70 mm.

Head : Arista with about 4 dorsal and 1 ventral branch including the terminal bifurcation. Antenna with pedicel and flagellomere pale yellow. Frons including ocellar triangle light brown. Orbitals in the ratio of 4:3:4. Facial carina light yellow. Palpus light brown with one apical seta. Vibrissa and subvibrissal setae equal. Gena light brown, greatest width of gena 0.15 the greatest diameter of eye. Eyes dark red.

Thorax : Acrostichal setulae in about 8 regular rows. Basal scutellars slightly convergent, posterior crossing each other. Anterior dorsocentral about one-fourth the distance between two anterior dorsocentral. Scutum and scutellum light brown. Sterno-index 0.8. Legs: Light brown. Preapicals on all three tibiae. 4th and 5th tarsomere dark brown. Wings (Text-fig. 2H): wing veins yellowish. R-m and dm-cu crossvein clear; C₁ setulae two equal; C₃ fringe 0.23. Average wing vein indices: C-index 2.00; 4V-index 2.55; 4C-index 1.40; 5X-index 1.5. Halter stem light brown, knob pale yellow.

Abdomen : 1st and 2nd tergites brown in the middle and black at the margins. 3rd, 4th, 5th and 6th tergites completely black. Periphallic organs (Text-fig.2J): Epandrium narrow above and broad below, pubescent. Upper portion bare and lower portion with about 9-10 setae. Surtylus large, separated from the epandrium and with about 12-13 small black prenisetae. Ventral lobe absent. Cencus separated from epandrium, elongate and with about 30-40 large setae. Phallic organs (Text-fig.2J):

Aedeagus short and pointed at the tip, basal apodeme slightly larger than hypandrial apodeme. Parameres large, pointed at the tip and leaf like. Gonopod absent. Hypandrium rounded. Hypandrial apodeme somewhat triangular. Oviscapt (Text-fig.2G): yellowish, medially, swollen, apically narrow and terminating into a large peg, with about 8 marginal and 3 discal ovisensillum and one subapical trichoid ovisensillum. Anteroventral bridge short and narrow.

Specimens examined: 1♂, 1♀: India: Uttar Pradesh, Kumaon, Pithoragarh district, Pithoragaph, 25. VII. 1997; Nainital district, Kailakhan, 3♂, 2♀, 27. VIII. 1997. Coll. Singh and Fartyal.

Distribution : Japan and India (new record).

Genus *Leucophenga* Mik

5. *Leucophenga bellula* (Bergroth)

Specimens examined: 6♂, 4♀: India: Uttar Pradesh: Nainital district, Haldwani, 17. VII. 1996; 5♂, 3♀, Almora district, Chaubattia, 25. VIII. 1997. Coll. Singh and Fartyal.

Distribution : Australia through South-east Asia to Micronesia, Taiwan, Japan, India and Nepal.

6. *Leocophenga neolacteusa* Singh and Bhatt

Specimens examined: 20♂, 16♀: India: Uttar Pradesh: Bageshwar district, Bageshwar, 16. VIII. 1996; 7♂, 5♀, Nainital district, Bhowali, 22. VII. 1997. Coll. Singh and Fartyal.

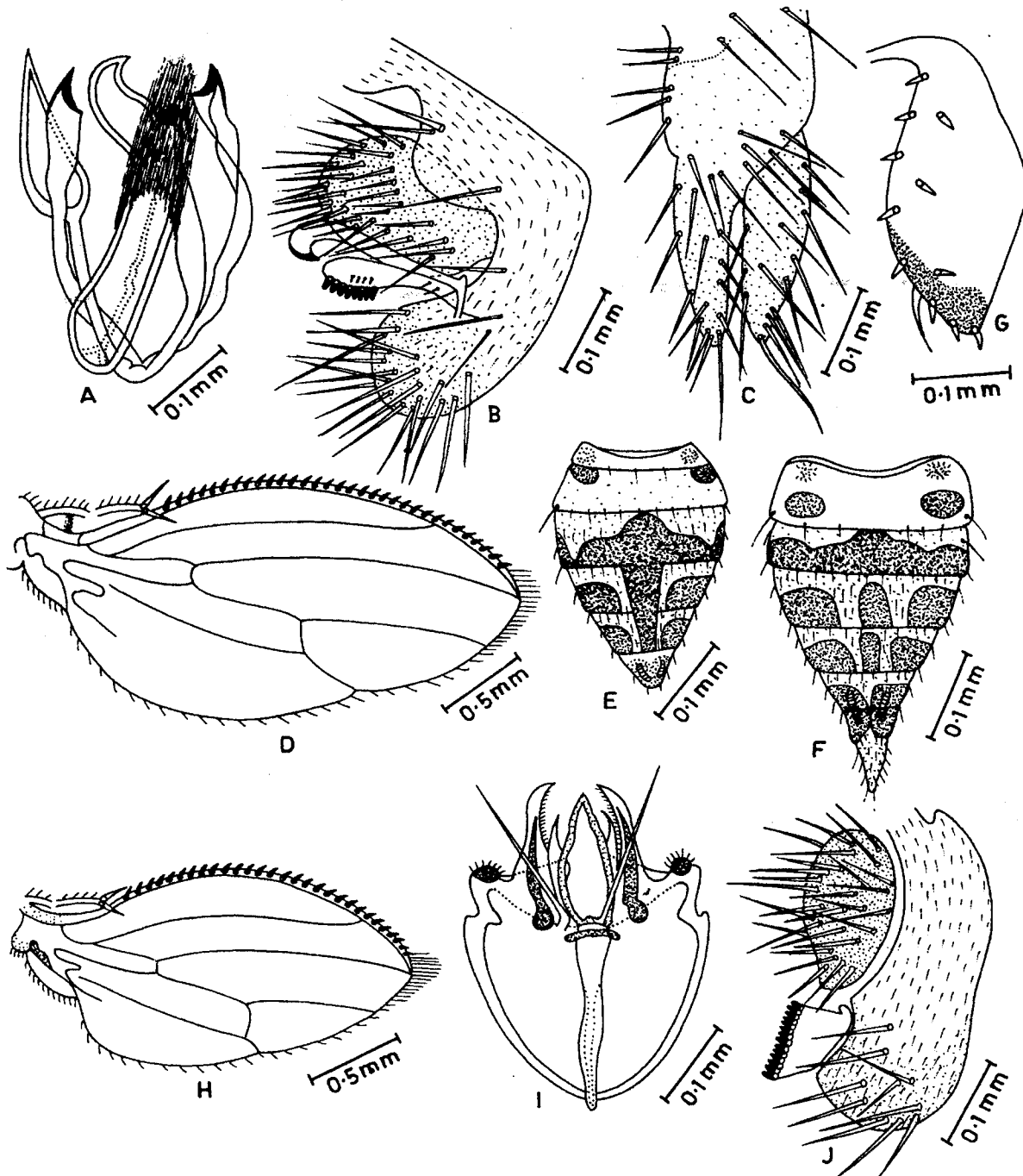
Distribution : India.

7. *Leocophenga albiceps* de Meijere

(Text-fig.2A-F)

Male and Female : Yellowish. Mean body length: males (n=3) 2.20 mm.; females (n=2) 2.70mm.

Head : Arista with about 6 dorsal and 3 ventral branches in addition to terminal bifurcation. Antenna with pedicel and flagellomere pale yellow. Frons including ocellar triangle light brown. Orbitals in the ratio of 7:5:6. Facial carina brown. Palpus light brown with one apical seta. Vibrissa and subvibrissal setae equal. Gena dark brown, greatest width of gena 0.14 the greatest diameter of eye. Eyes bright red.



Text-Fig. 2. *Leucophenga albiceps* de Meijere. A, phallic organs ; B, periphallic organs ; C oviscapt ; D, wing ; E, ♂ abdomen ; F, ♀ abdomen ; G-J : *Scaptodrosophila actinia* Okada. G, oviscapt ; H, Wing ; I, phallic organs ; J, periphallic organs.

Thorax : Acrostichal setulae in about 8 irregular rows. Basal scutellars divergent, posterior crossing each other. Anterior dorsocentral subequal to posterior dorsocentral; distance between anterior and posterior dorsocentral about half the distance between two anterior dorsocentral. Scutum and scutellum brown. Sterno-index 0.8. Legs: Light brown. Preapicals on all three tibiae and apicals on second tibiae only. Wings (Text-fig.2D): R-m and dm-cu crossveins clear. C₁ setulae two, equal. C₃ fringe 0.29. Average wing vein indices : C-index 2.94; 4V-index 1.57; 4C-index 0.85; 5X-index 1.25. Halter stem and knob yellowish white.

Abdomen : ♂ ♀ (Text-fig.2E-F): Abdominal tergites in male and female yellow with a pattern of dark areas. 1st abdominal tergite with two lateral dark spots. 2nd abdominal tergite with a dark band slightly elevated in the middle. 3rd, 4th, 5th and 6th abdominal tergites two lateral and one middle black spots. Periphallallic organs (Text-fig. 2B): Epandrium narrow about and broad below, pubescent. Upper portion with 4 and lower portion with about 18-19 setae. Surstylus large, club shaped with 13-14 small black prenisetae and a curved process. Ventral cercal lobe absent. Cercus separated from epandrium, oval and with about 25-30 large setae. Phallic organs (Text-fig.2A): Aedeagus short hairy and blunt at the tip. Basal apodeme equal to hypandrial apodeme. Parameres large, curved and pointed at the tip. Gonopod absent. Hypandrium concave. Hypandrial apodeme somewhat triangular. Oviscapt (Text-fig.2C): Brownish, trilobed. Upper lobe with about 17-18 ovisensilla and lower lobes with about 14-16 ovisensilla.

Specimens examined: 27♂, 27♀: India: Uttar Pradesh: Kumaon, Nainital district, Zoo area Cantt., Lariyakanda, 5. VI. 1997 to 27. VIII. 1997; Almora district, Chaubattia garden, 13♂, 17♀, 23 VIII. 1998; Nainital district, Patwadangar, 14♂, 19♀, 12IX. 1998. Coll. Singh and Fartyal.

Distribution : Nepal, Java, Formosa and India (new record).

Relationship : Differs slightly from the original form (Formosa, Duda, 1924) in having larger body and sometimes entirely yellow palpus.

Genus *Paraleucophenga* Hendel

8. *Paraleucophenga neojavanajii* Singh and Negi

Specimens examined: 10♂, 6♀: India: Uttar Pradesh: Pithoragarh district, Kanalicchina, 15. VII. 1996; 5♂, 3♀, Nainital district, Bhowali, 10. VIII. 1997. Coll. Singh and Fartyal.

Distribution : India.

Genus *Amiota* Loew

9. *Amiota bandes* Singh and Negi

Specimens examined: 20♂, 16♀: India: Uttar Pradesh: Nainital district, Okhalkanda, 12. VIII. 1997, 6♂, 4♀, Almora district, Chaubattia Garden (Ranikhet), 28. VII. 1998. Coll. Singh and Fartyal.

Distribution : India.

Genus *Gitona* Meigen

10. *Gitona distigma* Meigen

Specimens examined: 8♂, 5♀: India: Uttar Pradesh: Nainital district, Tanda, Haldwani, 20. VIII. 1996; 6♂, 4♀, Pithoragarh district, Pithoragarh, 12.VII.1998. Coll. Singh and Fartyal.

Distribution : Europe and India.

Genus *Zaprionus* Coquillett

11. *Zaprionus indianus* Gupta

Specimens examined : 250♂, 150♀: India: Uttar Pradesh: Nainital district, Haldwani, 21. VII. 1997; 105♂, 95♀, Almora district, Chaubattia Garden (Ranikhet), 16. VII. 1998. Coll. Singh and Fartyal.

Distribution : India.

Genus *Lissocephala* Malloch

12. *Lissocephala parasiatica* Takada and Momma

Specimens examined: 10♂, 7♀: India: Uttar Pradesh: Nainital district, Bhowali, 25. VII. 1996; 25♂, 20♀, Bageshwar district, Bageshwar, 11. VIII. 1998. Coll. Singh and Fartyal.

Distribution : Malaysia and India.

Genus *Scaptomyza* Hardy

13. *Scaptomyza himalayana* Takada

Specimens examined : 40♂, 35♀: India: Uttar Pradesh: Nainital district, Bhowali, 22. VII. 1996; 24, 20, Bageshwar district, Bageshwar, 16. VIII. 1987. Coll. Singh and Fartyal.

Distribution : Nepal and India.

14. *Scaptomyza quadruangulata* Singh and Dash

Specimens examined: 25♂, 20♀: India, Uttar Pradesh: Almora district, Chaubattia Garden (Ranikhet), 16. VII. 1997; 16♂, 14♀, Nainital district, Okhalkanda, 27. VIII. 1998. Coll. Singh and Fartyal.

Distribution : India.

Genus *Dettopsomyia* Lamb

15. *Dettopsomyia nigrovittata* Malloch

(Text-fig.3A-D).

Male and Female : Dark brown. Mean body length: males (n=4) 2.60 mm; females (n=3) 2.92 mm.

Head : Arista with about 3 dorsal and 2 ventral in addition to terminal bifurcation. Antenna with pedicel and flagellomere light brown. Frons including ocellar triangle light brown. Orbitals in the ratio of 5:6:4. Facial carina light brown. Palpus dark brown with 3-4 marginal setae. Vibrissa prominent and subvibrissal setae small. Gena dark brown, greatest width of gena 0.12 the greatest diameter of eye. Eyes bright red.

Thorax : Acrostichal setulae in about 4 regular rows. Apical scutellars convergent and basal scutellar setae divergent. Anterior dorsocentral subequal to posterior dorsocentral; distance between anterior and posterior dorsocentral about one-third the distance between two anterior dorsocentral. Scutum and scutellum dark brown. sterno-index 0.7. Legs: Dark brown. Preapicals on all three tibiae and apicals on second tibiae only. Wing (Text-fig. 3D): R-m and dm-cu crossveins clear; 3rd costal break with heavy setation on base. C₁ setulae two, equal. C₃ fringe 0.32. Average wing vein indices : C-index 1.22; 4V-index 2.77; 4C-index 2.44; 5X-index 1.80. Halter stem and knob pale yellow.

Abdomen: 1st and 2nd tergites yellowish. 3rd, 4th, 5th and 6th tergites uniformly brown. Periphallallic organs (Text-fig.3B): Epandrium narrow above and broad below,

pubescent. Upper portion bare, middle portion with 4 and lower portion with 8 small setulae. Surstylus large, fused with epandrium and with about 5-6 small black prenisetae. Ventral cencal lobe absent. Cercus large, fused with epandrium, quadrate and with about 24-25 large setulae. Phallic organs (Text-fig.3A): Aedeagus short and leaf like, basal apodeme equal to hypandrial apodeme. Parameres large, curved and pointed at the tip. Gonopod absent. Hypandrium rounded. Hypandrial apodeme somewhat triangular. Oviscapt (Text-fig.3C): Brownish, narrow above and below and broad in the middle with about 15-16 marginal ovisensillum and one subapical trichoid ovisensillum. Anteroventral bridge short and narrow.

Specimens examined : 2♂, 2♀: India: Uttar Pradesh, Kumaon, Nainital district, Lariyakanda, Kailakhan, 22.V. 1997; Champawat district, Champawat, 2♂, 3♀, 23. VII. 1997 Coll. Singh and Fartyal.

Distribution : Japan, Medeira, Canary Islands, North and South America, Africa (Zaiere), Australia (Sydney); India (new record).

De. nigrovittata is generally distributed in five regions such as Afrotropical, Palearctic, Nearctic, Neotropical and Australian regions.

Genus *Stegana* Meigen

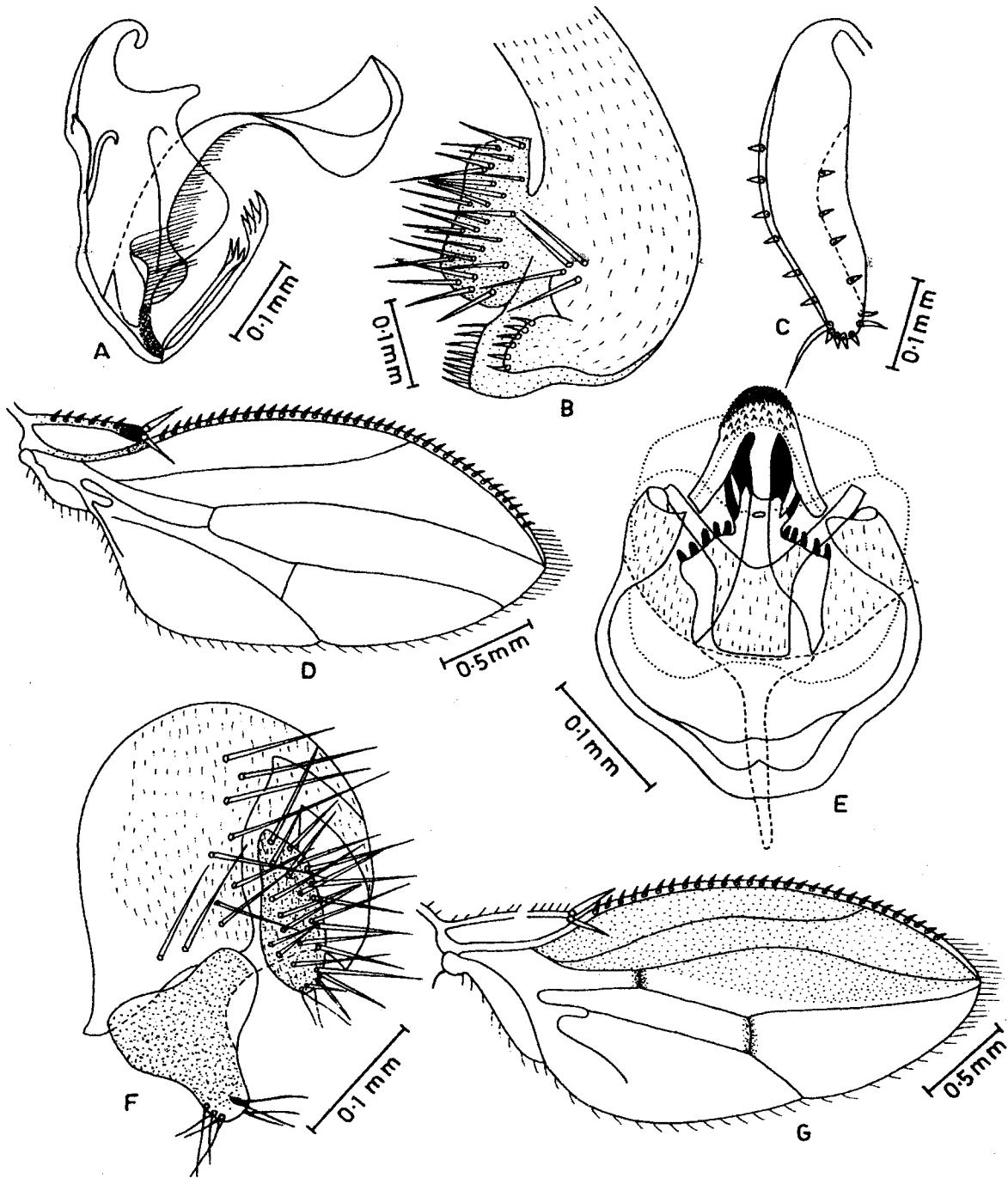
16. *Stegana (Steganina) nainitalensis* sp. nov.

(Text-fig. 3E-G)

Male and Female : Pale brown. Mean body length: males (n=3) 2.8 mm; females (n=2) 3 mm.

Head : Arista with about 8 dorsal and 5 ventral small branches in addition to terminal bifurcation. Pedicel light yellow; flagellomere greyish yellow, apically narrowing. Frons including ocellar triangle light brown. Orbitals in the ratio of 4:7:6. Facial carina light brown. Palpus yellow, with one prominent subapical and several moderate lateral setae. Gena dark brown, greatest width of gena 1/10 greatest diameter of eye. Eye brownish red.

Thorax: Acrostical setulae in about 9 irregular rows. Scutum dark brown with median obscure stripe. Scutellum dark brown. Basal scutellars divergent, posterior crossing each other. Anterior dorsocentral subequal to the posterior



Text-Fig. 3. *Dettopsomyia nigrovittata* Malloch. A, phallic organs ; B,Periphallic organs ; C, oviscapt ; D, wing ; E-G : *Stegana nainitalensis* Singh and Fartyal. E, phallic organs ; F, periphallic organs, G, wing.

dorsocentral; distance between anterior and posterior dorsocentral 1/4 the distance between two anterior dorsocentrals. Sterno-index 0.8. Legs: Brown, slightly yellowish at knee joints. Mid tibia proximally with 2 stout long bristles. Preapicals on all tibiae; apicals on fore and mid tibiae. Mid and hind tarsi with 2 and 1 row of minute cuneiform bristles on underside respectively. Wings (Text-fig.3G): R-m and dm-cu crossveins fuscous, wingveins yellowish brown. C₁ setulae two, equal. C₃ fringe 0.5. Average wing vein indices : C-index 1.83; 4V-index 2.2; 4C-index 1.28; 5x-index 2.0. Halter Stem and knob yellowish.

Abdomen : Abdominal tergites yellowish with narrow uninterrupted bands. Periphallial organs (Text-fig.3F): Epandrium narrow above and broad below, light brown, highly pubescent with 9-10 marginal setulae. Cercus separated from epandrium, narrow setigerous and pubescent. Surstylus hammer shaped, pointed downwards with about 9-10 small setulae. Ventral cercal lobe absent. Phallic organs (Text-fig.3E): Aedeagus round and densely haired at the tip, basal apodeme slightly larger than hypandrial apodeme. Parameres fan shaped with 5-6 small black teeth on the margin. Hypandrium slightly curved and pointed at the tip. Hypandrial apodeme round.

Holotype : ♂ (Accession No. NTL-68), India: Uttar Pradesh, Kumaon hills, Nainital district, Naina peak (Cheena peak), 7. XII. 1996. B.K. Singh and R.S. Fartyal. Deposited in the Department of Zoology, Kumaon University, Nainital.

Paratypes : 2♂, 2♀, same data as holotype. In the Department of Zoology, Kumaon University, Nainital and Institute of Low Temperature Science, Hokkaido, University, Sapporo, Japan.

Distribution : India.

Relationships : This species is a member of the subgenus *Steganina* of the genus *Stegana* where it resembles *Stegana cheni* Sidorenko, 1997 in having brown scutum with longitudinal stripes and shape of hypandrium but distinctly differs from it in the absence of teeth on hypandrium and number of setae on surstylus.

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