

Drosophilidae of Kumaun Region, India with the Description of Four New Species (Insecta : Diptera)

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3 Text-Figures

ABSTRACT

An account is given of thirty four species representing nine genera, *Drosophila*, *Scaptodrosophila*, *Leucophenga*, *Zaprionus*, *Lissocephala*, *Scaptomyza*, *Amiota*, *Gitona* and *Paraleucophenga* of the family Drosophilidae collected from the Kumaun region from July 1984 to April 1995. *Drosophila saraswati*, *Drosophila neobaimai*, *Drosophila neokhaoyana* and *Scaptodrosophila hirsuata* are described as new species.

Keywords : New species ; diptera ; drosophila ; Kumaun.

INTRODUCTION

The Indian Drosophilid fauna has been studied considerably in recent years and in most areas they have been collected fairly extensively. The members of the family Drosophilidae are widely distributed throughout the Indian subcontinent. This paper summarises the results of several surveys undertaken in Kumaun region, India from July 1984 to April 1995. Our previous studies on the Drosophilids of Kumaun region have yielded interesting results (Singh and Bhatt, 1988 ; Singh and Negi, 1989, 1992, 1995 ; Singh and Dash, 1993), though many areas remain uncovered from the above point of view. The Kumaun region, a wild hilly area is located at an elevation of 6,000 feet (1828 metres) from the sea level on the northeast periphery of the state of Uttar Pradesh. This region includes four border districts of the state, Nainital, Almora, Pithoragarh and Udham Singh Nagar. The area is characterized by having dense evergreen coniferous forest with medium to very steep slopes and extremely moist conditions due to heavy rain fall. Text-Fig. 1 shows the collection localities.

MATERIALS AND METHODS

The Drosophilid flies were collected during different seasons from July 1984 to April 1995. The flies were collected at several collecting stations in Kumaun region by different trapping methods. The collected flies were etherised and the species were identified. The unidentified females were placed individually in separate vials containing *Drosophila* food medium. The progeny obtained from each gravid female was then used for species identification.

Taxonomic Account

Genus *Drosophila* Fallen

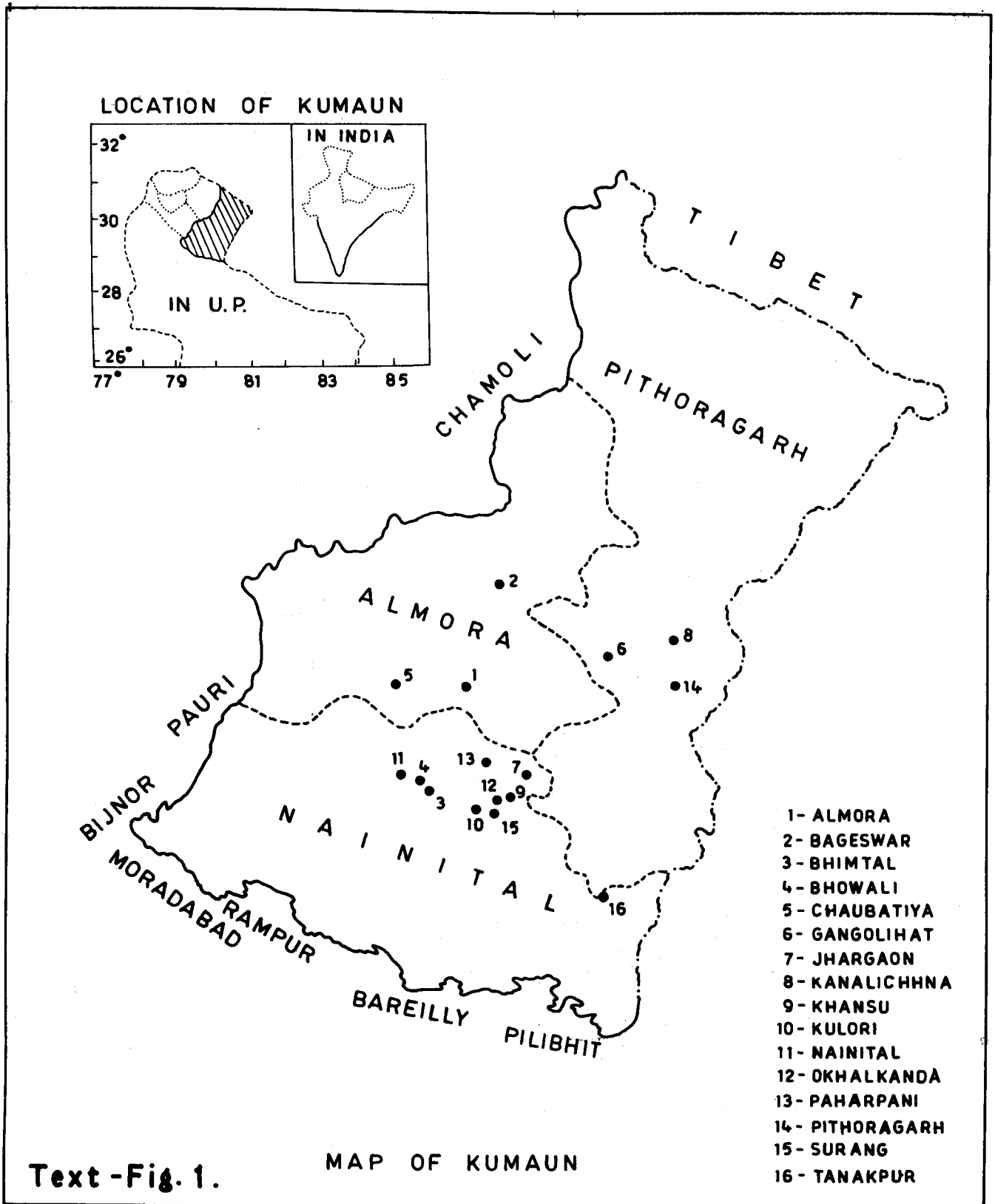
Drosophila Fallen 1823, Diptera Sueciae Geomyzides, 2:4. Type species : *Musca funebris* Sweden.

Subgenus *Sophophora* Sturtevant

Sophophora Sturtevant, 1939, Proc. Natl. Acad. Sci., 25: 139. Type Species : *Drosophila melanogaster* Meigen 1830 ; Austria and Germany.

1. *Drosophila bifasciata* Pomini

Drosophila bifasciata Pomini 1940, Bull. Ent. R. Univ. Bologna, 12 : 155. Type locality : Italy.



Text-Fig. 1. Map of Kumaun region showing collection localities.

Specimens examined : 130 ♂, 89 ♀; India : Uttar Pradesh : Nainital district, Ranikhet, 4.VII. 1985 ; 139 ♂, 105 ♀, Dehra Dun district, 16. VIII. 1984, Coll. Singh and Dash.

Distribution : Taiwan, Japan, India, Nepal, Borneo, Thailand, Philipines, New Guinea, Micronesia, Fiji, Samoa and Sumatra.

2. *Drosophila kikkawai* Burla

Drosophila kikkawai Burla. 1954, Rev. Brasil, 14:4:

47. Type locality : Brazil.

Specimens examined : 80 ♂, 70 ♀, India : Uttar Pradesh : Almora district, Almora, 16. VII. 1984, 84 ♂, 72 ♀, Nainital district, Nainital, 11. VII. 1985, Coll. Singh and Dash.

Distribution : Samoa, Japan, Hawaii, Fiji, Micronesia, New Guinea, China, South America, Nepal, Taiwan, Korea, India, Malaya, Thailand, Sumatra and Borneo.

3. *Drosophila malerkotliana* Parshad and Paika

Drosophila malerkotliana Parshad and Paika 1964, Res. Bull. Punjab Univ., 15 : 235. Type locality : Chandigarh, Pinjore and Malerkotla, India.

Specimens examined : 280 ♂, 212 ♀ : India : Uttar Pradesh : Almora district, Ranikhet, 15. VII. 1984; 170 ♂, 115 ♀, Pithoragarh district, Pithoragarh, 22. VII. 1985, Coll. Singh and Dash.

Distribution : Borneo, Philipines, Thailand, Malaya and India.

4. *Drosophila melanogaster* Meigen

Drosophila melanogaster Meigen 1830, Syst. Besch., 6 : 85.

Specimens examined : 92 ♂, 76 ♀, India : Uttar Pradesh : Nainital district, Bhowali, 14. VIII. 1986 ; 180 ♂, 130 ♀, Nainital district, Udham Singh Nagar, 20. VII. 1995. Coll. Singh and Dash.

Distribution : Cosmopolitan.

5. *Drosophila nepalensis* Okada

Drosophila nepalensis Okada, 1955, Flora and Fauna, Nepal, Himalaya, 1:388. Type locality : Nepal.

Specimens examined : 140 ♂, 110 ♀ : India : Uttar Pradesh : Pithoragarh district, Pithoragarh, 22. VII. 1984 ; 167 ♂, 140 ♀, Almora district, Bhujan, 5. VIII. 1986, Coll. Singh and Dash.

Distribution : Nepal, India, China and Thailand.

6. *Drosophila jambulina* Parshad and Paika

Drosophila jambulina Parshad and Paika 1964, Res. Bull. Punjab Univ., 15 : 240. Type locality : Chandigarh and Malerkotla, India.

Specimens examined : 170 ♂, 130 ♀ : India : Uttar Pradesh : Almora district, Almora, 14. VIII. 1984, 110 ♂, 105 ♀, Naintal district, Bhowali, 25. VIII. 1986. Coll. Singh and Dash.

Distribution : Asia, Taiwan, India, Australia.

7. *Drosophila suzukii indicus* Parshad and Paika

Drosophila suzukii indicus Parshad and Paika 1964, Res. Bull. Punjab Univ., 15 : 230. Type locality : Chandigarh and Manimajra, India.

Specimens examined : 60 ♂, 35 ♀, India : Uttar Pradesh : Almora district, Ranikeht, 26. VII. 1984 ; 45 ♂, 30 ♀, Pithoagarh district, Pithoragarh, 13. VIII. 1986. Coll. Singh and Dash.

Distribution : India.

8. *Drosophila takahashii* Sturtevant

Drosophila takahashii Sturtevant 1927, Philip. J. Sci., 32 : 371. Type locality : Taiwan.

Specimens examined : 140 ♂, 120 ♀, India : Uttar Pradesh : Almora district, Bhujan, 18. VIII. 1986, 110 ♂, 100 ♀, Nainital district, Jeolikot, 18. VII. 1987, Coll. Singh and Dash.

Distribution : Taiwan, Japan, Korea, China, Nepal, Thailand, Borneo, Philipines, Micronesia and India.

9. *Drosophila neobaimai* sp. nov. (Text-Fig.2)

Male and Female : Pale brown. Mean bodylength, Males (n = 4) 5.2 mm. ; Females (n = 3) 5.8 mm.

Head : Arista with 4-5 dorsal and 3-4 ventral branches in addition to terminal bifurcation. Antenna with pedicel and flagellomere dark brown. Frons including the ocellar triangle light brown. Orbitals in the ratio of 5:2:5. Facial carina brown. Palpi light brown, with single apical seta. Vibrissa and subvibrissal seta nearly equal. Gena dark brown, greatest width of gena 0.12 the greatest diameter of eye. Eyes dark red.

Thorax : Acrostichal setulae regular in 8 rows. Anterior scutellars convergent, posterior crossing each other. Anterior dorsocentral subequal to the posterior dorsocentral ; distance between anterior and posterior dorsocentral about half the distance between two anterior dorsocentrals. Scutum and scutellum light brown. Sterno-index - 0.75. Legs (Text-Fig.2D) ; light brown. Preapicals on all three tibiae, apicals on second tibiae only. Metatarsal segment with a large sex-comb - Wings (Text-Fig. 2C) : clear, yellowish. C₁ setulae two, equal ; C₃ fringe 0.35. Average wing vein indices : C-index 2.54 ; 4V-index 2.1 ; 4C-index 1.1 ; 5X-index 1.84. Halter stem dark, knob yellowish.

Abdomen : 1st tergite yellowish, 2nd and 3rd tergites light brown in the middle and dark black on sides, 4th, 5th and 6th tergites completely black. Periphallic organs (Text-Fig.2B) : Epandrium narrow above and below and broad in the middle. Upper portion with about 6-7 setulae and lower portion with about 11-12 setulae. Surtylus large, fused to epandrium with about 4-5 small black presisetae and 9-10 small setulae. Ventral cercal lobe club shaped and with about 5-6 small black prenisetae. Cerci separated from epandrium, elongate and with about 35-40 large setulae. Phallic organs (Text-Fig. 2A) : Aedeagus short and pointed at the tip, basal

apodeme slightly larger than hypandrial apodeme. Paramere large, leaf like and without any sensilla. Gonopod thin, anteriorly curved and fused with the aedeagus. Hypandrium S-shaped. Hypandrial apodeme somewhat triangular.

Holotype ♂, : India : Uttar Pradesh, Kumaun hills, Pithoragarh district, Kanalichhina. VIII. 1991, Coll. B. K. Singh and S. Dash. Deposited in the Department of Zoology, Kumaun University, Nainital. Paratypes : 1 ♂, 3 ♀, same data as holotype. In the Department of Zoology, Kumaun University, Nainital and Department of Biology, Tokyo Metropolitan University, Tokyo, Japan.

Distributuion : Uttar Pradesh, Kumaun, Pithoragarh.

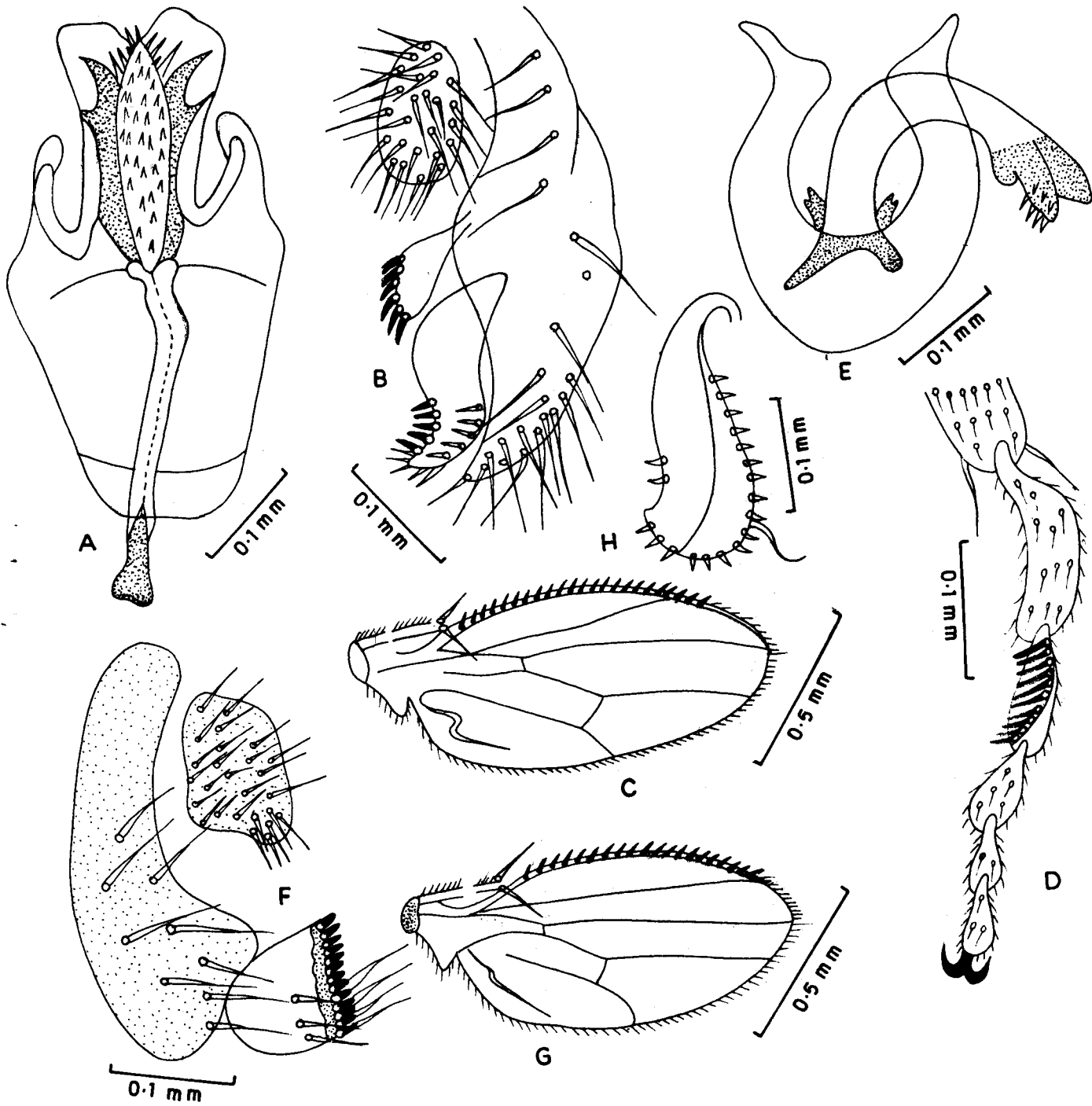
Relationships : This species is a member of the subgenus *Sophophora* of the genus *Drosophila* where it resembles *D. baimaii* Bock and Wheeler (1972) in external morphology but distinctly differs from it in the structure of phallic and periphallic organs.

10. *Drosophila neokhaoyana* sp. nov. (Text-Fig. 2)

Male and female : Pale brown. Mean body length, Males (n = 4) 5.2 mm, Females (n=3) 5.4 mm.

Head : Arista with 3-4 dorsal and 2 ventral branches in addition to terminal bifurcation. Antennae with pedicel and flagellomere dark brown. Frons including the ocellar triangle dark brown. Palpi brown. Facial carina brown. Orbital Setulae in the ratio of 5:4:7. Vibrissa and subvibrissal seta nearly equal. Gena dark brown, greatest width of gena 0.1 the greatest diameter of eye. Eyes dark red.

Thorax : Acrostichal setulae regular in 8 rows. Anterior scutellars convergent, posterior crossing each other. Anterior dorsocentral subequal to posterior dorsocentral ; distance between anterior and posterior dorsocentral about half the distance between two anterior dorsocentrals. Scutum and



Text - Fig. 2.

Text-Fig. 2. A-D : *Drosophila neobaimai* Singh and Dash. A, phallic organs ; B, periphallic organs ; C, wing ; D, male fore leg ; E-H : *Drosophila neokhaoyana* Singh and Dash. E, phallic organs ; F, periphallic organs ; G, wing ; H, oviscapt.

scutellum light brown. Sterno-index 0.75. Legs : light brown. Preapicals on all three tibiae, apicals on second tibia only. Wings (Text-Fig.2G) : Clear, yellowish, C_1 setulae two, equal ; C_3 fringe 0.33. Average wing vein indices : C-index 2.54 ; 4V-index 2.1 ; 4C-index 1.1, 5X-index 1.84. Halter stem light brown, knob yellowish.

Abdomen : In male 1st abdominal tergite, light brown, 2nd and 3rd tergites light brown in the middle and black on sides, rest of the tergites completely black. In female all tergites black. Periphallic organs (Text-Fig. 2F) : Epandrium narrow above and broad below. Upper portion with about 3-4 and lower portion with about 5-6 setulae. Primary surtylus large with about 13 black presetae arranged on outer margin. Cerci separated from epandrium, quadrate, with about 19-20 large setulae above and 5-6 small setulae on the lower portion. Phallic organs (Text-Fig.2E) : Aedeagus long and trilobed with several sensilla. Paramere short and leaf like. Gonopod absent. Hypandrium pointed. Ventral fragma rounded. Oviscapt (Text-Fig. 2H) : Yellowish, medially swollen, apically narrow and terminating into a large peg, with about 19 marginal ovisensillum and one subapical trichoid ovisensillum. Anteroventral bridge short and narrow.

Holytype ♂, : India : Uttar Pradesh : Kumaun hills, Pithoragarh district, Gangolihat, 7.VII. 1991, Coll. H. K. Singh and S. Dash. De-positd in the Department of Zoology, Kumaun University, Nainital. Paratypes, : 4 ♂ and 3 ♀, same data as holotype. In the Department of Zoo-logy, Kumaun University, Nainital and Department of Biology, Tokyo Metropolitan University, Tokyo, Japan.

Distribution : Uttar Pradesh, Kumaun, Nainital.

Relationships : This species is a member of the subgenus *Sophophora* of the genus *Drosophila* where it resembles *Drosophila khaoyana* Bock and Wheeler (1972) in external morphology, but distinctly differs from it in the structure of male terminalia and other details.

11. *Drosophila saraswati* sp. n. (Text-Fig. 3) :

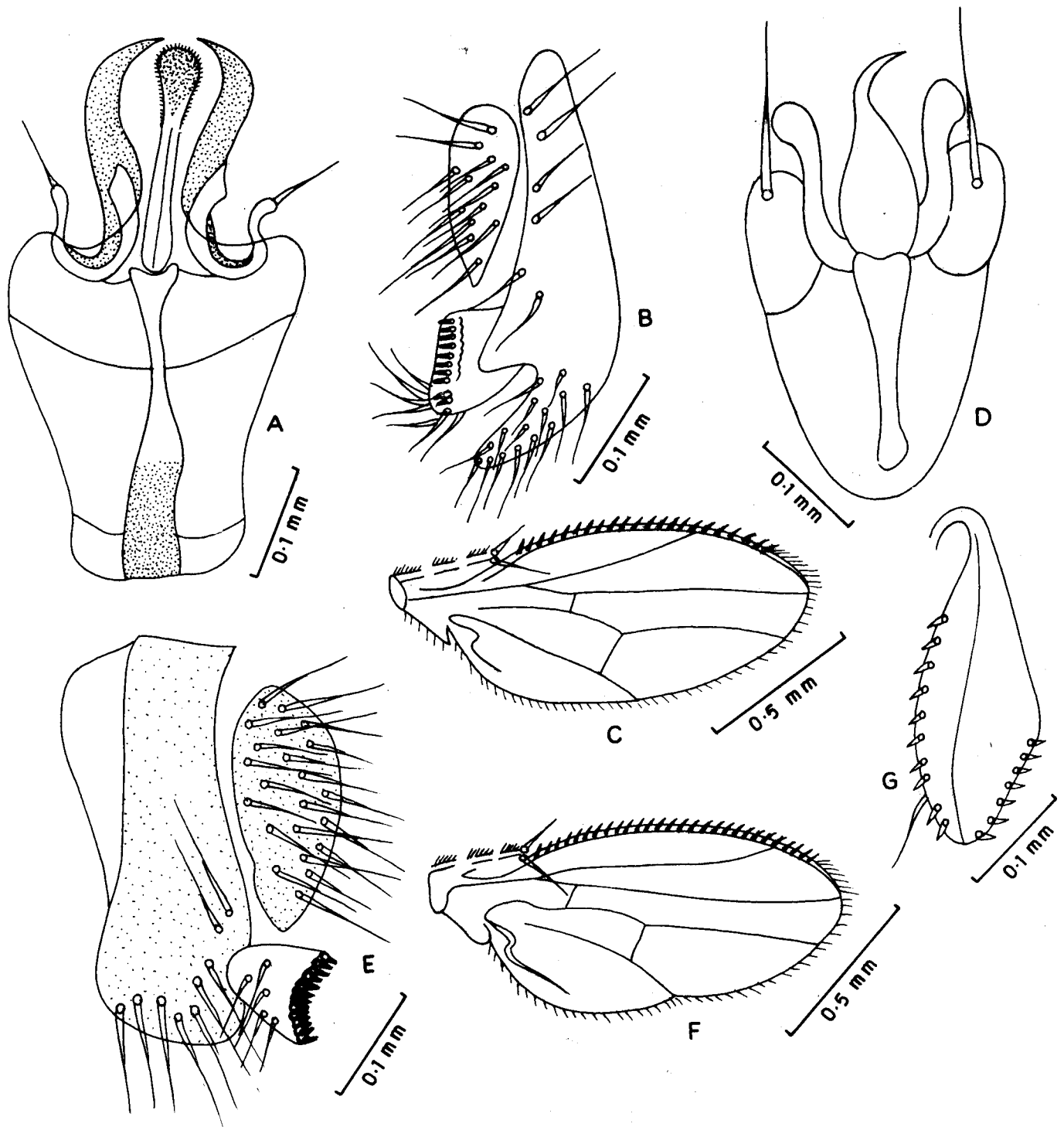
Male and Female : Brown. Mean body-length, Males (n = 2) 4.8 mm ; Females (n = 3) 5.4 mm.

Head : Arista with 5 dorsal and 3 ventral branches including the terminal bifurcation. Antennae with pedicel and flagellomere dark brown. Frons including ocellar triangle light brown. Palpi brown with one apical seta. Facial carina light brown. Orbital setulae in the ratio of 5:2:5. Subvibrissal seta about half the length of vibrissa. Gena brown, greatest width of gena 0.12 the greatest diameter of eye. Eyes dark red.

Thorax : Acrostichal hair regular in 8 rows. Anterior scutellars convergent ; posterior ones crossing each other. Anterior dorsocentral subequal to the posterior dorsocentral ; distance between anterior and posterior dorsocentral about 1/3 of the distance between anterior dorsocentrals. Scutum and scutellum unicolorous, light brown. Sterno-index 0.71 Legs : light brown. Preapicals on all three tibiae, apicals on second tibiae only. Wings (Text-Fig.3C) : Clear C_1 bristles two, equal ; C_3 fringe 0.33. Average wing vein indices : C-index 1.31 ; 4V-index 2.5 ; 4C-index 1.08 ; 5X-index 1.75. Halter stem brown, knob yellowish.

Abdomen : Abdominal tergites light brown with dark brown apical bands in male. Periphallic organs (Text-Fig. 3B) : Epandrium broad above and narrow below. Upper portion with about 4-5 setulae and lower portion with about 16-17 setulae. Surtylus large and curved with about 9-10 small black presetae, 6-7 setulae on the outer margin. Ventral cercal lobe absent. Cerci triangular and separated from epandrium with 24-25 large setulae. Phallic organs (Text-Fig. 3A) : Aedeagus short and club shaped. Basal apodeme equal to hypandrial apodeme. Paramere large and leaf like, without any sensilla. Gonopod small and curved with a single sensilla. Hypandrium rounded. Hypandrial apodeme quadrate.

Holytype ♂ : India : Uttar Pradesh : Kumaun hills, Pithoragarh district, Gangolihat, 20. VIII.



Text - Fig. 3.

Text-Fig. 3. A-C : *Drosophila sarawsati* Singh and Dash. A, phallic organs ; B, periphallic organs ; C, wing ; D-G : *Drosophila hirsuata* Singh and Dash. D, phallic organs, E, periphallic organs ; F, wing ; G, oviscapt.

1991. Coll. B. K. Singh and S. Dash. Deposited in the Department of Zoology, Kumaun University, Nainital. Paratypes : 3 ♂, 2 ♀, same data as holotype. In the Department of Zoology, Kumaun University, Nainital and Department of Biology, Tokyo Metropolitan University, Tokyo, Japan.

Distribution : Uttar Pradesh, Kumaun, Nainital.

Relationships : This species is a member of the subgenus *Sophophora* of the genus *Drosophila* where it resembles *D. serriflabella* Okada (1966) in the structure of periphallallic organs but distinctly differs from it in other details.

Subgenus *Drosophila*. Fallen S. Str.

Drosophila Fallen 1823, Diptera Sueciae, Geomyzides, 2:4 Type species : *Musca funebris* Fabricious, 1787 : 384.

12. *Drosophila immigrans* Sturtevant

Drosophila immigrans Sturtevant 1921, Carnegie Inst. Wash. Publ., 301:83. Type locality : New York, U.S.A.

Specimens examined : 205 ♂, 189 ♀ : India : Uttar Pradesh : Nainital district, Nainital, 20. VII. 1985 ; 189 ♂, 150 ♀, Almora district, Almora, 25. VII. 1986, Coll. Singh and Dash.

Distribution : Cosmopolitan.

13. *Drosophila lacertosa* Okada

Drosophila lacertosa Okada 1956, Syst. Study Drosophilidae, Japan : 158, Type locality : Iwete Pref., Japan.

Specimens examined : 170 ♂, 165 ♀ : India : Uttar Pradesh : Nainital district, Nainital, 25. VII. 1984 ; 95 ♂, 80 ♀, Almora district, Ranikhet, 20. VII. 1986. Coll. Singh and Dash.

Distribution : Japan, Korea, Nepal and India.

14. *Drosophila repleta* Wollaston

Drosophila repleta Wollaston 1858, Ann. Mag. nat. Hist., 41 : 117. Type locality : Madeira, Africa.

Specimens examined : 50 ♂, 250 ♀ : India : Uttar Pradesh : Pithoragarh district, Pithoragarh,

24. VII. 1985 ; 58 ♂, 50 ♀, Nainital district, Bhowali, 16. VIII. 1986. Coll. Singh and Dash.

Distribution : Cosmopolitan.

15. *Drosophila trizonata* Okada

Drosophila trizonata Okada 1966, Bull. Br. Mus. Hist. (Ent.) Suppl., 6:97. Type locality : Above Sangu, Taplejung, Nepal.

Specimens examined : 20 ♂, 17 ♀ : India : Uttar Pradesh : Almora district, Ranikhet, 26. VII. 1987 ; 40 ♂, 35 ♀, 21. VII. 1988. Coll. Singh and Dash.

Distribution : Nepal and India.

16. *Drosophila panuaiti* Singh and Negi

Drosophila paunaiti Singh and Negi, 1989, Proc. Zool. Soc., Calcutta, 40 : 19-26. Type locality : Pauna, Chamoli district, Chamoli, Garhwal.

Specimens examined : 50 ♂, 35 ♀ : India : Uttar Pradesh : Almora district, Ranikhet, 20. VII. 1990 ; 15 ♂, 10 ♀, Nainital district, Bhowali, 22. VII. 1991. Coll. Singh and Dash.

Distribution : India.

17. *Drosophila nainitalensis* Singh and Bhatt

Drosophila nainitalensis Singh and Bhatt 1988, Oriental Insects, 22 : 147-161. Type locality : Nainital, India.

Specimens examined ; 30 ♂, 15 ♀ : India : Uttar Pradesh : Almora district, Bageshwar, 22. VII. 1991 ; 20 ♂, 15 ♀, Pithoragarh district, Gangolihat, 26. VIII. 1989. Coll. Singh and Dash.

Distribution : India.

18. *Drosophila bishtii* Singh and Negi

Drosophila bishtii Singh and Negi 1992, Senckenbergiana Biol., Vol. 72, No. 4/7.

Specimens examined : 25 ♂, 20 ♀ : India : Uttar Pradesh : Nainital district, Khansu, 18. VII. 1990 ; 13 ♂, 10 ♀, Nainital district, Okhalkanda, 22. VI. 1991. Coll. Singh and Dash.

Distribution : India, Kumaun, Nainital.

19. *Drosophila painii* Singh and Negi
Drosophila painii Singh and Negi 1992, Senckenbergiana Biol. Vol. 72, No. 4/7.
 Specimens examined : 25 ♂, 15 ♀, : India : Uttar Pradesh : Nainital district, Kulori, 20.VII.1989 ; 15 ♂, 12 ♀, Almora district, Ranikhet, 22.VI.1991. Coll. Singh and Dash.
 Distribution : India, Kumaun, Nainital.
- 20 *Drosophila sulfurigaster* Duda
Drosophila sulfurigaster (Duda) 1923. Ann. Hist. nat. Mus. Hung. 20:48. Type locality : New Guinea.
 Specimens examined : 12 ♂, 6 ♀, : India : Uttar Pradesh : Nainital district, Surang, 16.VII.1990 ; 15 ♂, 12 ♀, Pithoragarh district, Kanalichhina, 25.VI.1991. Coll. Singh and Dash.
 Distribution : India, Kumaun, Nainital.
21. *Drosophila repleta* Wollaston
Drosophila repleta Wollaston 1858, Ann. Mag. nat. Hist., 41: 117. Type locality : Madeira.
 Specimens examined : 159 ♂, 125 ♀, : India : Uttar Pradesh : Nainital district, Kulori, 16.VII.1984 ; 55 ♂, 35 ♀, Almora district, Lodhia, 22.VII.1985. Coll. Singh and Dash.
 Distribution : Cosmopolitan. Subgenus *Dorsilopha* Sturtevant.
Drosophila Sturtevant 1942, Univ. Texas Publ., 4213 : 28. Type species : *Drosophila busckii* Coquillett, U.S.A.
22. *Drosophila busckii* Coquillett
Drosophila busckii Coquillett 1901, Ent. News, 12 : 18. Type locality : U.S.A.
 Specimens examined : 110 ♂, 95 ♀, : India : Uttar Pradesh : Nainital district, Tanakpur, 15.VII.1984, 125 ♂, 110 ♀, Almora district, Chaubatiya, 22.VIII.1986. Coll. Singh and Dash.
 Distribution : Conmopolitan.
 Genus *Scaptodrosophila* Duda
Scaptodrosophila Duda 1923, Annls. Hist. nat. Mus. Hung., 20:37. Type species : *Scaptodrosophila scaptomyzoidea*, New Guinea.
- Scaptodrosophila* Duda (revised status as genus) : Ref. Grimaldi, 1990, Bull. Amer. Mus. Nat. Hist., 197-1-139.
23. *Scaptodrosophila coracina* Kikkawa and Peng
Scaptodrosophila coracina Kikkawa and Peng 1938, Jap. J. Zool., 7 : 523.
 Specimens examined : 75 ♂, 65 ♀, : India : Uttar Pradesh : Nainital district Okhalkanda, 20.VII.1986 ; 50 ♂, 45 ♀, Nainital district, Surang, 30.VII.1992. Coll. Singh and Dash.
 Distribution : India, China, Japan and Borneo.
24. *Scaptodrosophila chandraprabhiana* Gupta and Ray Chaudhuri
Scaptodrosophila chandraprabhiana Gupta and Ray-Chaudhuri 1970, Proc. Roy. ent. Soc. Lond. (B), 39:62.
 Specimens examined : 130 ♂, 110 ♀, : India : Uttar Pradesh : Nainital district, Khansu, 20.VII.1985 ; 70 ♂, 63 ♀, Almora district, Chaubatiya, 12.VIII.1995. Coll. Singh and Dash.
 Distribution : India.
25. *Scaptodrosophila hirsuata* sp.nov. (Text-Fig.3)
 Male and Female : Pale brown. Mean body length, Males (n = 5) 2.45 mm . Females (n=3) 3.01 mm.
 Head : Arista with 4 dorsal and 1 ventral branch including the terminal bifurcation. Antennae with pedicel and flagellomere dark brown. Frons including the ocellar triangle light brown. Orbitals in the ratio of 5:2:5. Second oral setulae half and length of first oral setulae. Facial carina brown. Palpi brown with 2-3 marginal setae. Clypeus light brown. Vibrissa and subvibrissal seta nearly equal. Gena brown, greatest width of gena 0.2 the greatest diameter of eye. Eyes dark red.
 Thorax : Acrostichal setulae regular in 8 rows. Anterior scutellars convergent, posterior crossing each other. Anterior dorsocentral subequal to posterior dorsocentral, distance between anterior

and posterior dorsocentral about 1/4 of the distance between anterior dorsocentrals. Scutum and scutellum Unicolorous black. Sterno-index 0.8. Legs : Light brown Preapicals on all three tibiae, apicals on second tibia only. Wings (Text-Fig. 3F) : Hazy, yellowish. C_1 setulae two unequal ; C_3 fringe 0.33. Average wing vein indices : C-index 3.2 ; 4V-index 1.44 ; 4C-index 0.68, 5X-index 1.5 Haltere stem dark, knob yellowish.

Abdomen : Abdominal tergites dark black with brown apical bands. Periphallic organs (Text-Fig. 3E) : Epandrium narrow above the broad below. Upper portion bare, lower portion with about 9-10 large setulae. Primary surtylus small, fused with epandrium and with about 11-12 small black prenisetae arranged in a concave row and 4-5 small setulae. Cerci large, somewhat oval and with about 22-23 large setulae. Phallic organs (Text-Fig. 3D) : Aedeagus short and pointed at the tip. Basal apodeme of aedeagus slightly shorter than hypandrial apodeme. Paramere large and leaf like. Gonopod absent. Hypandrium rounded with one large setulae. Hypandrial apodeme trinangular. Oviscapt (Text-Fig. 3G) : Yellowish, medially swollen, apically narrow and terminating into a round structure with about 18-19 marginal ovisensilla and one subapical trichoid ovisensillum. Anteroventral bridge narrow.

Holotype ♂, : India : Uttar Pradesh : Kumaun hills, Nainital district, Tanakpur, 28.VIII.1992, Coll. B. K. Singh and S. Dash. Deposited in the Department of Zoology, Kumaun University, Nainital. Paratypes : 4 ♂, 3 ♀, same data as holotype. In the Department of Zoology, Kumaun University, Nainital and Department of Biology, Tokyo Metropolitan University, Tokyo, Japan.

Distribution : India, Kumaun, Nainital.

Relationships : This species is a member of the genus *Scaptodrosophila* where it resembles *Drosophila (Scaptodrosophila) minima* Okada (1966) in the structure of periphallic organs, but

distinctly differs from it in other details.

Genus *Leucophenga* Mik

Leucophenga Mik 1986, Wien. ent. Ztd., 5:317. Type species : *Drosophila maculata* Dufour, Europe ;

26. *Leucophenga bellula* (Bergrowth)

Drosophila bellula Bergrowth 1894, Stettin. Entomol. 2, 55 : 75. Type locality : Central Queensland, Australia.

Specimens examined : 4 ♂, 3 ♀, : India : Uttar Pradesh : Nainital district, Tanda, Haldwani, 15.VII.1986 ; 3 ♂, 2 ♀, Almora district, Bhujan, 22.VIII.1989. Coll. Singh and Dash.

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

27. *Leucophenga neolacteusa* Singh and Bhatt

Leucophenga neolactensa Singh and Bhatt-1988, Oriental Insects, 22 : 147-161. Type locality : India, Kumaun, Nainital.

Specimens examined : 15 ♂, 11 ♀, : India : Uttar Pradesh : Nainital district, Bhowali, 12.VII.1988 ; 6 ♂, 5 ♀, Almora district, Ranikhet, 15.VIII.1990. Coll. Singh and Dash.

Distribution : India, Kumaun, Nainital.

Genus *Paraleucophenga* Hendel

Paraleucophenga Hendel 1914 ; 114.

Type species : *Paraleucophenga trisetosa* Handel ; Syn. *Trichiaspiphenga* Duda 1924 a ; 185. Type species : *Helomyza invicta* Walker.

28. *Paraleucophenga neojavanaii* Singh and Negi

Paraleucophenga neojavanaii Singh and Negi 1992 ; Senckenbergiana Biol., 72 : 321-327. Type locality : Nainital, Kumaun, India.

Specimens examined : 6 ♂, 4 ♀, : India : Uttar Pradesh : Nainital district, Bhowali, 18.VII.1992 ; 3 ♂, 2 ♀, Almora district, Rajikhet, 15.VIII.1990, Coll. Singh and Dash.

Distribution : India.

Genus *Amiota* Loew

Amito Loew 1862, Berl. Ent. Zeit. 6:229. Type species : *Amiota leucostoma* Loew.

29. *Amiota bandes* Singh and Negi

Amiota bandes Singh and Negi 1992, Senckenbergiana Biol., 72 : 321-327. Type locality : Nainital, Kumaun, India.

Specimens examined : 10 ♂, 6 ♀, : India : Uttar Pradesh : Nainital district, Govt. House, 20.IV.1991. Coll. Singh and Dash.

Distribution : India.

Genus *Gitona* Meigen

Gitona Meigen 1830, 30 : 130. Type species : *Gitona distigma* Meigen.

30. *Gitona distigma* Meigen

Gitona distigma Meigen 1830, 30 : 130. Type locality : Europe.

Specimens examined : 4 ♂, 3 ♀, : India : Uttar Pradesh : Pithoragarh district, Gangolihat, 25.VIII.1989. Coll. Singh and Dash.

Distribution : Europe and India.

Genus *Zaprionus* Conquillet

Zaprionus coquillet 1902, Proc. U. S. natn. Mus., 24:31. Type species : *Zaprionus vittizer* Conquillet, Rhodesia, South Africa.

31. *Zaprionus indianus* Gupta

Zaprionus indianus Gupta 1970, Proc. Indian Acad. Sci., 36 : Type locality : Allahpur, Badaun district, Uttar Pradesh, India.

Specimens examined : 150 ♂, 140 ♀, : India : Uttar Pradesh : Nainital district, Haldwani, 15.VII.1985 ; 80 ♂, 75 ♀, Almora district, Chaubatiya Garden (Ranikhet), 28.VII.1986. Coll. Singh and Dash.

Distribution : India.

Genus *Lissocephala* Malloch

Lissocephala Malloch 1929, Ann. Mag. nat. Hist. 4:250. Type species : *Lissocephala unipunctata* Malloch 1929, Salisburg, Rhodesia.

32. *Lissocephala parasiatica* Takada and Momma

Lissocephala parasiatica Takada and Momma 1975, J. Fac. Sci. Hokkado Univ. Ser. Zool. 20:24. Type locality : Malaysia.

Specimens examined : 6 ♂, 4 ♀, : India : Uttar Pradesh : Nainital district, Bhowali, 15.VII.1988 ; 3 ♂, 4 ♀, Almora district, Almora, 18.VIII.1989. Coll. Singh and Dash.

Distribution : Malaysia and India.

Genus *Scaptomyza* Hardy

Scaptomyza Hardy 1849, Proc. (Berwicksh), Nat. Club. 2:361. Type species : *Drosophila graminum* Fallen 1823, by description of conquillet (1910603).

33. *Scaptomyza himalayana* Takada

Scaptomyza himalayana Takada 1970, Annotnes Zool. Japan, 43:146. Larjing, Papla, Nepal.

Specimens examined 20 ♂, 13 ♀, : India : Uttar Pradesh : Almora district, Bhowali, 16.VII.1987 ; 26 ♂, 18 ♀, Nainital district, Tanda, 22.VIII.1989. Coll. Singh and Dash.

Distribution : Nepal and India.

34. *Scaptomyza quadruangulta* Singh and Dash

Scaptomyza quadruangulata Singh and Dash 1993, Proc. Zool. Soc., Calcutta, 46(2) : 131-140. Type locality : Okhalkanda, Nainital, Kumaun, India.

Specimens examined : 20 ♂, 17 ♀, : India : Uttar Pradesh : Nainital district, Bhowali, 17.VII.1992 ; 25 ♂, 19 ♀, Nainital district, Okhalkanda, 21.VIII.1990. Coll. Singh and Dash.

Distribution : India.

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