

Description of three new species of *Drosophila* (*Scaptodrosophila*) from Orissa, India

J P GUPTA and K K PANIGRAHY

Genetics Laboratory, Department of Zoology, Banaras Hindu University,
Varanasi 221 005, India

MS received 29 March 1982 ; revised 8 October 1982

Abstract. *Drosophila koraputae*, *D. neomedleri* and *D. puriensis* all belonging to the subgenus *Scaptodrosophila* are described as new species. Their taxonomic relationships, based on the morphology and male genital structures, are established.

Keywords. Drosophilidae ; *Drosophila koraputae* ; *D. neomedleri* ; *D. puriensis*.

1. Introductions

Until recently very little has been known concerning the Drosophilid fauna of Orissa (Gupta 1972 ; Dasmohapatra *et al* 1981). This paper deals with the descriptions of three more new species collected recently from a wild area in Koraput district of Orissa.

2. Taxonomic descriptions

2.1. Genus *Drosophila* Fallen

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

2.2. Subgenus *Scaptodrosophila* Duda

Scaptodrosophila Duda, 1923, Mus. Nat. Hungarici, Ann. 20 : 37. Type species : *Scaptodrosophila*.

Scaptomyzoidea Duda ; New Guinea

Paradrosophila Duda, 1923, Mus. Nat. Hungarici, Ann. 20 : 43. Type species ; *Drosophila pictipennis* Kerte'SZ ; New Guinea.

Pugiodrosophila Duda, 1924, Arch. Naturg. 90A (3) : 203. Type species : *Drosophila pugionota* de Meijere ; Simalur.

Xiphidiochaeta Duda, 1925, Mus. Nat. Hungarici, Ann. 22 : 200 (improper replacement name for *Pugiodrosophila*; type: *D. pugionota* de Meijere).

Pholadoris Sturtevant, 1942, Univ. Texas publ. 4213 : 28. Type species: *Drosophila victoria* Sturtevant; United States.

2.3. *Drosophila* (*Scaptodrosophila*) *koraputae*, sp. nov.

2.3a. *Head*, ♂ and ♀: Arista with 4 dorsal and 3 ventral branches in addition to terminal fork. Antennae with second segment reddish brown; third segment brown. Frons including ocellar triangle pale brown. Orbitals in ratio of 7 : 4 : 11, anterior reclinate orbital closer to proclinate than posterior reclinate. Vibrissa strong, second oral not differentiated. Palpi pale, slender, with 3-4 marginal setae. Carina brown, broad and high. Face and cheek dark brown, greatest width of cheek 0.16 the greatest diameter of eye. Clypeus dark brown. Eyes dark red.

2.3b. *Thorax*, ♂ and ♀: Acrostichal hairs somewhat irregular, in 8-10 rows. Prescutellars well developed. Anterior scutellars convergent; posterior scutellars crossing each other. Anterior dorsocentral two-fifth length of posterior dorsocentral; distance from anterior dorsocentral to posterior dorsocentral about half the distance between two anterior dorsocentrals. Mesonotum brown; with a rectangular dark brown dorsal median patch on posterior half. Scutellum pale brown dorsal median patch on posterior half. Scutellum pale brown, with lateral sides black. Humerals two, outer thicker and long. Thoracic pleura dark brown, with a faint pale stripe. Sterno-index about 0.7. Legs yellowish brown, pre-apicals on all three tibiae; apicals on first and second tibiae.

2.3c. *Abdomen*, ♂ and ♀: Abdominal tergites yellow, 2T-3T with dark brown medially interrupted uniformly broad black bands, Sternites brown.

2.3d. *Wings*, ♂ and ♀ (*figure 1D*): Clear. C_1 bristle one; C_3 bristles on basal about three-fourth of third costal section. Halteres white.

2.3e. *Periphallidic organs* (*figure 1A*): Epandrium yellowish brown, pubescent, broadened below, with 5 bristles on upper half and 15 closely placed bristles on lower half. Surstylus small, with 8-9 black, stout teeth arranged in a row on outer margin and a few fine setae ventrally. Cerci elongate, pubescent, with 22 small bristles.

Table 1. Average wings indices calculated from 10 ♂♂ and 4 ♀♀.

	C-index	4V-index	4C-index	5X-index
Male	2.38	2.0	1.0	2.0
Female	2.52	2.12	1.16	1.92

Average length of wing 2.78 mm (♂); 2.9 mm (♀)

Average length of body 2.49 mm (♂); 2.7 mm (♀).

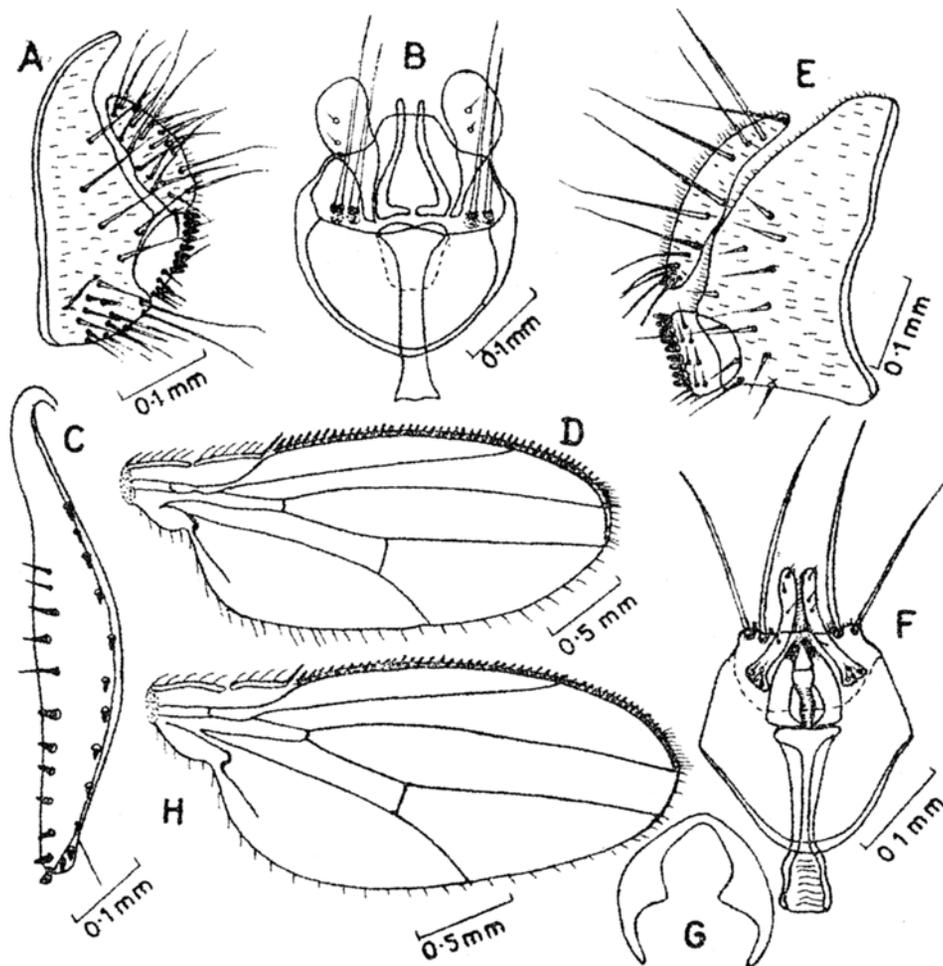


Figure 1. (A-D). *Drosophila koraputae* sp. nov.: A. Periphallalic organs; sp. nov. B. Phallic organs; C. egg-guide; D. male wing. (E-H). *Drosophila neomedleri*. E. Periphallalic organs; F. Phallic organs; G. Decasternum; H. Male wing.

2.3f. *Phallic organs* (figure 1B): Aedeagus pale, bifid, broadened below, basal apodeme of aedeagus straight, about one and half times as long as aedeagus. Anterior gonapophyses pale, club shaped with 2 subapical sensilla. Hypandrium medianly projected, with two pairs of long stout submedian spines, ventral fragma hemispherical.

2.3g. *Egg-guides* (figure 1C): Lobe yellow, elongate with 13 marginal teeth, apical tooth with broad tip, and with 11 discal teeth, upper five bristle like. Holotype ♂, India: Narayanpur, Koraput District, Orissa April 1981, Colls. Gupta and Panigrahy.

Paratypes: 7 ♂♂, 2♀♀, collection data same as holotype.

All type specimens are at present deposited in the Museum, Department of Zoology, Banaras Hindu University, Varanasi, India. 2 ♂♂ and 1 ♀ from

the paratype series are also deposited in the " *Drosophila* collection " of Department of Biology, Tokyo Metropolitan University, Tokyo, Japan.

2.3h. *Relationships* : This species in the brunnea group closely resembles *D. scutellimargo* Duda, but it distinctly differs from it, having a rectangular, dark brown dorsal median patch on posterior half of mesonotum (no median patch in *Scutellimargo*), 2T-3T with dark brown medially interrupted uniformly broad apical bands (2T-3T brownish yellow, with white fluorescence in *Scutellimargo*), anterior gonapophyses club shaped, with 2 subapical sensilla (large, dorsally curved with many sensilla in *Scutellimargo*), hypandrium with 2 pairs of submedian spines (1 pair in *Scutellimargo*), ventral fragma hemispherical (almost squarish in *Scutellimargo*).

Distribution : India.

2.4. *Drosophila (Scaptodrosophila) nemeodleri* : sp. nov.

2.4a. *Head*, ♂: Arista with 4 dorsal and 2 ventral branches in addition to terminal fork. Antennae with second segment reddish brown ; third segment pale brown. Frons pale brown, ocellar triangle dark brown. Orbitals in ratio of 8 : 2 : 10. Second oral thin, about half the length of vibrissa. Palpi pale brown, slender, with one prominent apical and 2-3 fine ventral setae. Carina dark brown, moderately ridged. Face and cheek dark brown, greatest width of cheek 0.14 the greatest diameter of eye. Clypeus black. Eyes dark red.

2.4b. *Thorax*, ♂: Acrostichal hairs somewhat irregular, in 6-8 rows. Anterior scutellars nearly convergent ; posterior scutellars crossing each other. Anterior dorso central half the length of posterior dorsocentral; distance from anterior dorsocentral to posterior dorsocentral about two-fifth the distance between two anterior dorsocentrals. Mesonotum and scutellum unicolorous, blackish brown, tip of scutellum white. Thoracic-pleura blackish brown. Sterno-index about 0.6. Legs brown, coxae, femora and tibia of fore legs blackish brown ; coxae and femora of mid and hindlegs dark brown ; tarsal segments of all legs yellowish brown, joints lighter. Preapicals on all three tibiae ; apicals on first and second tibiae.

2.4c. *Abdomen* ♂ : 1 Tergite pale yellow, 2T with narrow medially interrupted brown apical band, 3T with medially interrupted broad band, the remainder tergites completely dark brown. Last two sternites light brown.

2.4d. *Wings*, ♂ (*figure 1H*) : Hyaline. C_1 bristle one ; C_3 bristles on basal about two-fifth of third costal section. Halteres white.

Table 2. Average wings indices calculated from 11 ♂♂.

	C-index	4V-index	4C-index	5X-index
Male	1.8	2.21	1.31	2.0

Average length of wing 2.47 mm (♂) ; Average length of body 2.74 mm (♂).

2.4e. *Periphallic organs* (figure 1E) : Epandrium brown, pubescent broadened below and narrowly projected at heel, with 12 bristles running from the middle of posterior margin downwards. Surstylus small, with 9 small dissimilar teeth arranged in a straight row on outer margin and 6 short dorso-medial and a few fine setae ventrally. Cerci brown, pubescent, narrow and elongate, with 7 upper long and 5-6 smaller bristles. Decasternum (figure 1G) brown, with lateral pieces inwardly projected.

2.4f. *Phallic organs* (figure 1F) : Aedeagus brown, short and stout, apically pointed and hairy. Basal apodeme of aedeagus straight and thick, about twice as long as aedeagus. Anterior gonapophyses pale, narrow, finger like having 4 basal sensilla and 4 equidistantly placed upper sensilla. Hypandrium with 2 pairs of strong submedian spines, inner pair little longer. Ventral fragma rounded distally.

2.4g. *Holotype* ♂, *India* : Narayanpur, Koraput District, Orissa, April, 1981 Colls. Gupta and Panigraphy.

2.4h. *Paratypes* ; 8 ♂♂, collection data same as holotype.

All type specimens are at present deposited in the Museum, Department of Zoology, Banaras Hindu University, Varanasi, India. 2 ♂♂ from the paratype series are also deposited in the "*Drosophila* Collection" of the Department of Biology, Tokyo, Metropolitan University, Tokyo, Japan.

2.4i. *Relationships* : This species resembles *D. medleri* Tsacas and Chassagnard in having somewhat similar male genital structures, but distinctly differs in having mesonotum with no silvery stripes (mesonotum with four brown broad stripes having silvery fluorescence, in *medleri*), surstylus with a row of 9 small dissimilar teeth arranged in a straight row (with a row of 11 similar strong teeth arranged in a concave row in *medleri*), ventral fragma rounded distally (almost rectangular in *medleri*).

Distribution : India.

2.5. *Drosophila (Scaptodrosophila) puriensis, sp. nov.*

2.5a. *Head*, ♂ and ♀ : Arista with 4 dorsal and 3 ventral branches in addition to long terminal fork. Antennae with second segment reddish-brown ; third segment pale brown. Frons including ocellar triangle dark brown. Orbitals in ratio of 8 : 5 : 12. Vibrissa strong, second oral not differentiated. Palpi pale brown, slender with 3-4 marginal setae. Carina brown, narrow, high and somewhat broadened below. Face and cheek brown, greatest width of cheek 0.12 the greatest diameter of eye. Clypeus dark brown. Eyes dark red.

2.5b. *Thorax*, ♂ and ♀ : Acrostichal hairs very small, in 8-10 rows between dorsocentrals. Anterior scutellars nearly parallel ; posterior scutellars crossing each other. Anterior dorsocentral half the length of posterior dorsocentral ; distance from anterior dorsocentral to posterior dorsocentral about one-third the distance between two anterior dorsocentrals. Mesonotum shiny dark brown, anteriorly lighter, with narrow and faint longitudinal streaks in the line of dorsocentrals. Scutellum blackish brown with yellowish tip. Humerals two,

subequal, outer strong. Thoracic pleura blackish-brown. Sterno-index about 0.6. Legs: Dark brown, tarsal segments slightly lighter. Preapicals on all three tibiae; apicals on first and second tibiae.

2.5c. *Abdomen*, ♂ and ♀: 1 Tergite pale yellow. 2T-4T with shiny broad black bands, the remainder tergites uniformly black. Sternites black.

2.5d. *Wings*, ♂ and ♀ (figure 2D): Clear C_1 bristle one; C_3 bristles on basals three-fourth of third costal section. Halteres white.

Table 3. Average wings indices calculated from 12 ♂♂ and 14 ♀♀.

	C-index	4V-index	4C-index	5X-index
Male	2.36	2.0	1.0	1.87
Female	2.48	2.12	1.18	1.72

Average length of wing 2.52 mm (♂) 2.66 mm (♀); Average length of body 2.81 mm (♂) 3.02 mm (♀).

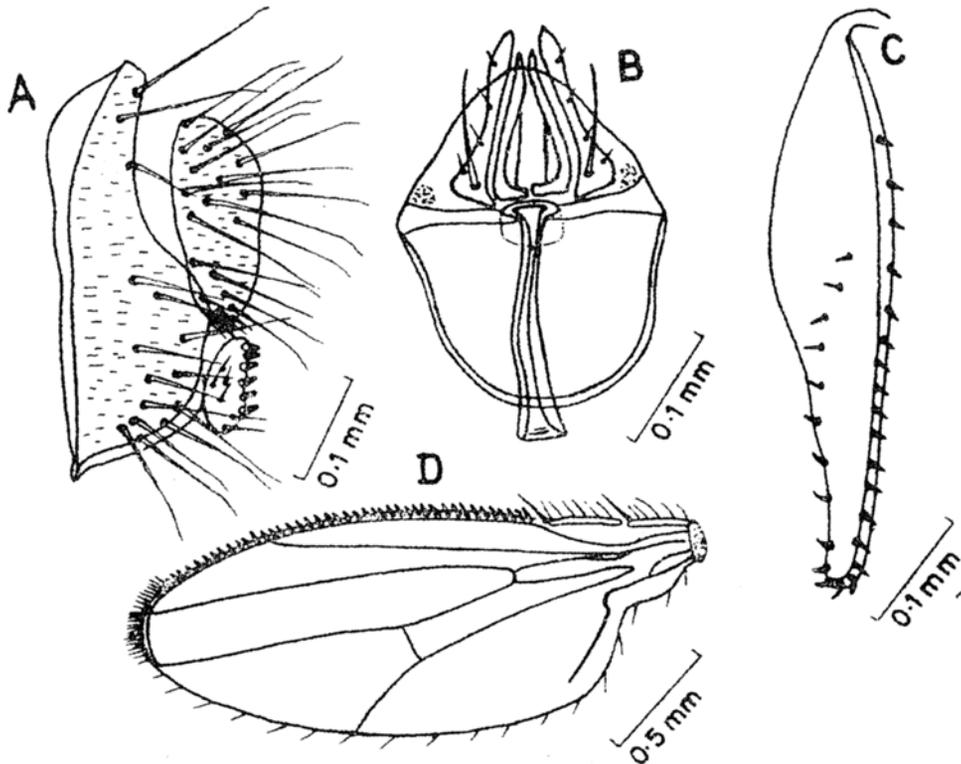


Figure 2 (A-D). *Drosophila puriensis* sp. nov. A. Peripheral phallic organs; B, Phallic organs; C. egg-guide; D, Male wing.

2.5e. *Periphallid organs (figure 2A)* : Epandrium yellowish brown, pubescent, broadened below with 3 long bristles on upper half and 12 similar bristles on lower half. Surstylus small, with 6 small teeth arranged in a straight row and 4 dorso-medial and 2 ventral setae. Cerci pale yellow, large elongate, pubescent, with 17 long and 4-5 stout setae ventrally.

2.5f. *Phallic organs (figure 2B)* : Aedeagus pale, bifid, crescentric in lateral aspect ; narrowing distally ; basal apodeme of aedeagus about one and half times as long as aedeagus. Anterior gonapophyses pale, blade like, narrowing apically, contiguous with aedeagus, with 4 equidistantly placed marginal sensilla. Posterior gonapophyses fused together forming a triangular process. Hypandrium with a pair of submedian spines of moderate length. Ventral fragma hemispherical.

2.5g. *Egg-guides (figure 2C)* : Lobe yellow, elongate with 23 small marginal teeth and 5 discal bristles. Basal isthmus thick and short.

2.5h. *Holotype* ♂, *India* : Narayanpur, Koraput District, Orissa, April 1981, Colls. Gupta and Panigrahy.

2.5i. *Paratypes* : 8 ♂♂, 11 ♀♀, collection data same as holotype.

All type specimens are at present deposited in the Museum, Department of Zoology, Banaras Hindu University, Varanasi, India. 2 ♂♂ and 1 ♀ from the paratype series are also deposited in the "*Drosophila* Collection" of the Department of Biology, Tokyo Metropolitan University, Tokyo, Japan.

2.5j. *Relationships* : This species somewhat resembles *D. parabrunea* Tsacas and Chassagnand, but it distinctly differs from it in having surstylus with 6 sparsely placed stout teeth (with a group of tightly placed 12 strong teeth in *Parabrunea*), anterior gonapophyses with 4 equidistantly placed sensilla (with numerous scattered sensilla in *parabrunea*), egg-guide with 28 teeth, apical teeth placed apart (with 40 teeth, five apical teeth tightly placed in *parabrunea*), submedian spines of moderate length (usually long in *parabrunea*).

Distribution : India.

Acknowledgements

The authors are thankful to Dr T Okada, Emeritus Professor, Department of Biology, Tokyo Metropolitan University, Tokyo, Japan, for his help in confirming the identifications and to Prof. M S Kanugo, Head of the Zoology Department, for facilities. One of us (KKP) is thankful to UGC for awarding Teacher Fellowship under the Faculty Improvement Programme.

References

- Dasmohapatra D P, Tripathy N K and Das C C 1981 Distribution of different species of *Drosophila* in Khallikote Ghats, Ganjam District, Orissa, India ; D.I.S. 56 45
Gupta J P 1972 *D. orissaensis*, A new species of *Drosophila* from Orissa, India, *Oriental Ins.* 6 561-563