ENTOMON 41(4) : 339-346 (2016)
Article No. ent. 41411

Review of *Semaranga* Becker (Diptera: Chloropidae: Chloropinae) with description of a new species from India

P.T. Cherian*

Department of Zoology, University of Kerala, Kariavattom, Trivandrum 695581, India
Email: Cherian_pt07@yahoo.co.in

ABSTRACT: *Semaranga* Becker is reviewed and a second species, *S. subtriangularis* Cherian sp. n. is described from India. © 2016 Association for Advancement of Entomology

KEYWORDS: Chloropidae, Mepachymerini, *Semaranga subtriangularis* Cherian sp. n., India

INTRODUCTION

Semaranga Becker is a small genus known by the type species *S. dorsocentralis* Becker. It is distributed in the Afrotropical and Oriental Regions, including India. Andersson (1977) in his revisionary work on Chloropidae of the world placed the genera *Semaranga* and *Elachiptereicus* Becker under the *Semaranga* genus group proposed by him because of the similarities between the two genera pointed out also earlier by Sabrosky (1951). Later Nartshuk (1983) erected the tribe Mepachymerini and placed the above two genera along with three more namely, *Centorisoma* Becker, *Mepachymerus* Speiser and *Steleocerellus* Frey under it because of some characters they have in common. These tribal placements are followed today. *Semaranga* is unique in the subfamily Chloropinae in possessing three pairs of *dc* bristles on scutum in place of one pair found in all other genera of the subfamily.

While studying the genus *Semaranga* two groups of specimens were observed, one representing true *S. dorsocentralis* species and another, a related but different species. The original description of *dorsocentralis* by Becker was silent on some important characters.The study of the detailed redescription of the species by Andersson (1977) and later by Kanmiya (1983) indicated that the former dealt with true specimens of *dorsocentralis* while Kanmiya based his description probably on two groups of specimens, one representing true *dorsocentralis* and the other a different species as revealed by discrepancies in the descriptions of body characters and diagrams of male genitalia. A new species is described here, its differences with *dorsocentralis* are stated, species limits are drawn and a key to both the species is given.

The type specimens are retained at present in the collections of the Department of Zoology, University of Kerala, Trivandrum and shall later be deposited in the National Zoological Collections, Western Ghats Regional Centre, Zoological Survey of India, Kozhikode (Calicut), Kerala, India.

Genus *Semaranga* Becker

Semaranga Becker, 1911. *Annales Historico-Naturales Musei Nationalis Hungarici,* 9: 48. Type species : *Semaranga dorsocentralis* Becker. By monotypy.

* Author for correspondence

Diagnosis: Medium-sized shining flies with three pairs of long straight *dc* bristles, reniform *ant* 3, thickened and pubescent black arista and approximated cross-veins.

Emended characters. Head wider and higher than long; frons projecting beyond anterior margin of eye, weakly convex, shining, nontomentose with a few *fr*; frontal triangle large, glabrous, shiny and reaching anterior margin of frons; *if* proclinate, in a row outside frontal triangle along its margin; face rather flat, sloping, higher than wide with rather indistinct facial carina; antenna yellow; *ant* 2 small, almost as long as or longer than wide*; ant* 3 longer than wide or wider than long, reniform with slightly angulate dorsodistal margin; arista terminal, black, broadly thickened with short, dense black pubescence; gena wider than *ant* 3 with punctate hairs mostly in lower half; vibrissal corner not reaching anterior margin of eye; postgena very well developed; parafacialia not very distinct in profile; eye small, broad oval with oblique long axis and very sparse and fine pubescence; palpi short, cylindrical; proboscis short; head bristles with stout *ovt* and *ivt,* long widely divergent *oc*, short, proclinate and divergent *pv*t and 5-6 short *orb*; scutum moderately convex, longer than wide, glabrous, nontomentose, shining yellow to reddish yellow with deeply brown to partly black longitudinal bands; humeral callus yellow with dark spot; pleura glabrous and shining with rather indistinct or distinct maculae; scutellum with nearly rounded or nearly subtriangular distal margin and weakly convex disc; thoracic bristles well developed but *h* 1 and *pa* 2 absent*; npl* 1+2, subequal to *pa* 1; *dc* 3, long, straight; *as* well developed, a little longer than scutellum; *ss* 1 almost half as long as *as.* wing hyaline with *r-m* and *m-m cross*-veins strongly approximated; distance between cross-veins less than length of *m-m;* R_{4+5} and M_{1+2} straight but divergent; haltere yellow; legs slender and elongated; tibial organ long and narrow; abdomen usually suboval, finely tomentose with dark hairs; male genitalia elongate and geniculate; surstylus attached to anteroventral aspect of epandrium; pregonites not developed; postgonites narrowly elongate with a pair of stout long to very long black bristles near its middle; basiphallus narrowly elongate; distiphallus bifid at apex; ovipositor rather short and stout.

Distribution: Oriental and Afrotropical Regions

Remarks: *Semaranga* shows close affinities to members of *Elachiptereicus* Becker (Cherian *et al*., 2014) in the nature and development of head, antenna, wing with approximated *r-m* and *m-m* cross-veins and general nature of male genitalia as emphasized by earlier authors, including Sabrosky (1951), Cherian *et al*. (2014) and others. However *Semaranga* differs from *Elachiptereicus* chiefly in the former having 3 pairs of well developed *dc* bristles, an unusual feature in the subfamilies Chloropinae, Rhodesiellinae and Oscinellinae expect for *Tricimbomyia* Cherian (1989) under Oscinellinae in which 2 pairs of *dc* bristles are present. Hence *Semarang*a is considered a distinct genus as recognized by earlier workers including Nartshuk (1983) who placed it under the tribe Mepachymerini Nartshuk.

This genus is hitherto known by the type species *S. dorsocentralis* Becker which is widely distributed in the Afrotropical and Oriental Regions, including India. It is apparent from the descriptions of *S. dorsocentralis* by earlier workers like Andersson (1977) and especially Kanmiya (1983) and a few others that their description of this species was based on two distinct species, one representing true *dorsocentralis* and the other a different species. According to Kanmiya (1983*),* third segment of arista is 4x as long as the second in *dorsocentralis* but in true *dorsocentralis* and the new species described below*,* 3rd aristal segment is at most 2.2x as long as the second. Kanmiya either might have erred in describing this character, which does not normally happen with his descriptions or else a different species was involved. However specimens studied by Kanmiya are not readily available for verification at present.

Key to species of *Semaranga*

ant 3, 1.3x as wide as long; *ant* 2 about 0.9x as

long as wide; facial carina rather indistinct; scutellum nearly rounded at apex*; as* rather widely separated at base, distance between bases of *as* and *ss* 1 much less than that between bases of *as;* proportions of costal sectors 2 to 4 in the ratio 22:20:11; ……*dorsocentralis* Becker

ant 3, 1.2x as long as wide; *ant* 2, 2x as long as wide; face a little raised medially; scutellum nearly subtriangular at apex*; as* not very widely separated at base, distance between bases of *as* only a trifle more than that between bases of *as* and *ss* 1; second costal sector 1.36 to 1.5x as long as third sector. ……*subtriangularis*,Cherian sp. n.

***Semaranga dorsocentralis* Becker**
(Pl. 1, Figs. 1-4)

Semaranga dorsocentralis Becker (1911): 48. Type localities: Indonesia: Semarang; India: Bombay.

Male and female (Pl.1): Head predominantly yellow to orange yellow, higher than long, length, height and width ratio 8:10:12; frons projecting beyond anterior eye margin, about 1.4x as long as wide and nearly 0.47x as wide as head, yellow to yellowish brown and with a few black *fr* mostly in anterior half; frontal triangle nearly as wide as frons at vertex, glabrous, shiny yellow to orange yellow, in some specimens with deep brown tinge at apex and area immediately behind, reaching anterior margin of frons and ending with pointed apex; face yellow to yellowish brown, rather flat, sloping, higher than long but in some specimens midlongitudinal area along about two-thirds length of face between bases of antennae slightly raised and hence with concave sides and a little raised epistomal margin; antenna yellow but in some specimens basal segments deeply brownish; *ant* 2 almost as long as wide; *ant* 3 reniform, about 1.3x as wide as long, narrowly darkened along dorsodistal margin; arista at apex of *ant* 3, black broadly thickened with very dense short, black hairs; first basal segment of arista as long as wide, second segment about 2x as long as wide, third segment about 1.6x as long as combined length of basal segments and 2.3x as long as second, though according to Kanmiya, third segment is 4x as long as the second; eye small, broad oval with oblique long axis and very sparse, minute pubescence; gena very broad, strongly widened in the area of postgena, width in the middle about 1.3x that of *ant* 3, distinctly rugose with slender, punctate hairs mostly in lower half, in most specimens yellow but a few with dark tinge; vibrissal corner almost a right angle, not reaching anterior margin of frons; cephalic bristles as described for the genus; scutum a little narrower than head and about 1.1x as long as wide, moderately convex, a little flattened posteriorly, smooth, not tomentose, shiny yellow with three dark brown to black broad longitudinal bands of which median commences from anterior margin and in most specimens tapers off a little beyond middle of scutum posteriorly and each submedian band commences from level of lower margin of humeral callus and extends whole length of scutum; besides the three longitudinal bands lateral to each submedian one linear to a little more developed oblong black macula is present which often partly merges with the submedian band; in some specimens median band is largely discoloured, appearing reddish brown to reddish yellow; scutal hairs rather scattered, short pale brown; pleura pale, glabrous, in most specimens with variously developed reddish brown to brown maculae on part of *kepst;* meron and rarely on *anepm*; scutellum about 1.4x as wide as long, shiny yellow with infuscated laterobasal corners as a continuation of the infuscation of submedian dark bands on scutum, with rounded oval distal margin and weakly to distinctly convex disc bearing a few short pale brown hairs; thoracic bristles black, well developed, as described for the genus*; dc* 3, straight much longer than *npl*, of these anterior most is presutural and the rest postsutural in position*; as* straight, as long as scutellum; ss 1 less than half of *as;* distance between bases of *ss* and *as* much less than that between bases of *as;* wing hyaline with brown veins and hairs; proportions of costal sectors 2 to 4 in the ratio 22:20:11; last section of M_{1+2} evanescent; *r-m* cross-vein far distad of middle of discal cell, opposite 0.82 of its length; distance

between *r-m* and *m-m* shorter than length of *m-m*; terminal sectors of R_{4+5} and M_{1+2} divergent; anal field slightly receding; haltere yellow; legs slender with short black hairs, almost entitrely yellow with only the last tarsal segment of all legs infuscated but in older specimens variously developed brown tinge is discernable on coxa, some femora, tibiae and some distal tarsal segments of fore leg; tibial organ long and narrow; abdomen predominantly yellow but in some specimens some segments with dark tinge, longer than wide and wider than thorax, subshiny, finely grey tomentose with short dark hairs. Female cerci relatively short with a few fine hairs; male genitalia (Figs. 1-4) as described for the genus.

Length: Male - 2.2 - 2.5 mm: wing 2.1 - 2.3 mm. Female - 2.4 - 2.8 mm; wing 2.3 - 2.7 mm.

Specimens studied: 2 ♂, 2 ♀; Nicobar Is., Camerota, 40.0319° N, 15.3751° E 6. x. 1972, Coll. P.T. Cherian; 1 ♀ (head broken off), Meghalaya: Shillong; Mawphlang. 6. ix. 1975, Coll. N. Muraleedharan; 1 female; Meghalaya: Shillong. 9. ix. 1975, Coll. N. Muraleedharan; 2 ♂, 8 ♀; Meghalaya: Cherrapunji; 5 .v. 1979, Coll. G.K. Srivastava.

Remarks: *S. dorsocentralis* is very widely distributed in the Oreintal and Afrotropical Regions and is the only species of *Semaranga* known. Because of the discrepancies in the descriptions and differences in the diagrams of the genitalia of *dorsocentrali*s by earlier workers like Andersson (1977) and Kanmiya (1983), it is evident that Kanmiya had dealt with two distinct species, one representing true *dorsocentralis* and the other a different species. Based on the present study of specimens from diverse demes and their male genitalia, it is apparent that Andersson's description was based on the study of true specimens of *dorsocentralis* whereas that by Kanmiya was probably based on some specimens of *dorsocentralis* and also others representing a different species. The differences between the two are given in the key to species and under remarks that follows the description of the new species.

Distribution: China: Kiangsi, Yunnan, India: Meghalaya, Maharashtra, Nicobar Is, W. Bengal; Indonesia: Java; Philippines: Luzon; Russia: Maritime territory; widely distributed in Africa; Japan: Honshu, Kyushu, Amami and Ishigaki Islands, Hawai.

***Semaranga subtriangularis* Cherian sp.n.**

LSID urn:lsid:zoobank.org:act:8C8C348B-9F1D-43DD-B2B6-6F94A7621FAC

(Pls. 2-4, Figs. 5-6)

Male [(Pl. 2) and female: Head (Pl. 3) is Predominantly yellow, higher than long, length, height and width ratio 16:19:25. Frons projecting a little beyond anterior margin of eye but less so than in *dorsocentralis*, 1.2x as long as wide and 0.52x as wide as head at vertex, yellow to yellowish brown, very finely tomentose with a few well developed black *fr;* frontal triangle nearly as wide at vertex as frons, large, glabrous, shiny yellow to orange yellow, reaching anterior margin of frons and ending with pointed apex. Face yellow to yellowish brown with dark tinge around epistomal margin in some specimens, sloping, higher than long, mid longitudinal area a little raised up to epistomal margin, giving the impression of a distinct facial carina, especially in some specimens. Basal antennal segment hidden by projecting frons; *an*t 2 yellow but with distinct dark tinge in some specimens, 2x as long as wide unlike in *dorsocentralis* in which it is only almost as wide as long*; ant* 3 reniform, 1.2x as long as wide, yellow but infuscated along dorsodistal margin; arista at apex of *ant* 3, black, broadly thickened with short, very dense black hairs; proportions of lengths of three flagellar segments in the ratio 2:5:11; second flagellar segment a trifle more than 2x as long as wide. Gena wide, very widened at area of postgena, width in middle 1.3x that of *ant* 3, distinctly rugose as in *dorsocentralis* with slender, punctate hairs mostly in lower half, yellow to brownish yellow; vibrissal corner almost a right angle; parafacialia narrow, often not visible in profile. Proboscis short, yellow but a little infuscated in some specimens; palpi cylindrical, yellow but rarely appearing infuscated because of black hairs. Eye relatively small, broad oval with oblique long axis and very minute, sparse

Plate 1. ***Semaranga dorsocetralis*** **Becker, Female fly**

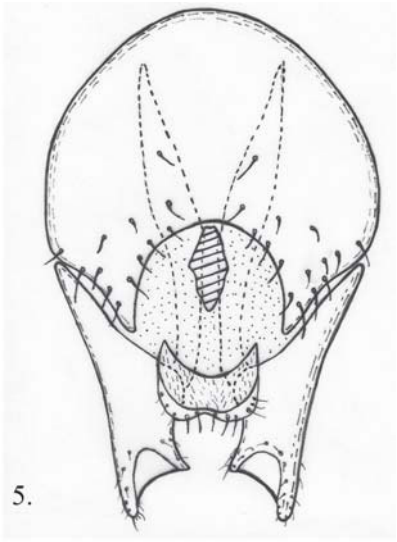
Plate 2-4. ***Semaranga dorsocetralis*** **sp.no. 2. Male fly, 2. I lead, dorsal view, 4. Scutellum.**

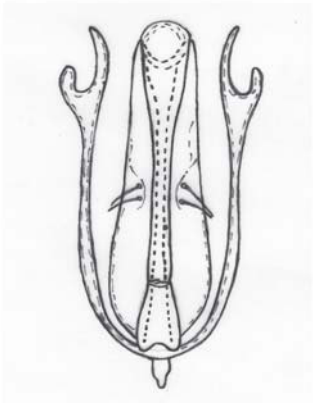
pubescence. Head bristles as in *dorsocentralis* with well developed *ovt* and *ivt*, long, proclinate and divergent *oc*, short, slender, proclinate and slightly divergent *pvt*, 5-6 *orb* and 5-6 well developed, proclinate *if* along margin of frontal triangle mostly in anterior half.

Thorax: Scutum a little narrower than head and as wide as long, moderately convex but less so posteriorly, smooth, not tomentose, shiny yellow with three reddish brown to dark brown, broad longitudinal bands as in *dorsocentralis* but in some specimens including the holotype, median band is very faint and almost indistinct and in all specimens it commences from anterior margin of scutum, is abbreviated posteriorly and fades off around middle of scutum and each submedian is often divided at around transverse suture and appears on each side as two distinct bands below transverse suture; humeral callus yellow with dark spot medially; scutal hairs scattered, pale brown; pleura glabrous, shiny yellow with reddish brown to a little infuscated large macula on *meron* and part of *kepst* and more faint smaller maculae on *anepm* but in some specimens the maculae are rather indistinct and appear as glabrous and shiny patches only. Scutellum (Pl. 4) nearly subtriangular, 1.35x as wide as long, with less convex and almost flattened yellow disc than in *dorsocentralis* which is often with brown to dark brown infuscation at laterobasal corners which extends a little more along lateral margins. Thoracic bristles well developed; *npl* 1+2, subequal and equal to *pa* 1; *dc* 3, straight, much longer than *npl*, sequentially posterior ones becoming longer and stouter; distance between bases of posterior most *dc* much more than that between those of *dc* 1 and *dc* 2 as in *dorsocentralis*; *as* 1.2x as long as scutellum; *ss* 1, 0.55x the *as*; bases of *as* nearer to each other than in *dorsocentralis* and only a trifle more than that between bases of *as* and *ss* 1.

Wing: Hyaline 2.58x as long as wide with yellowish brown to brown veins and brown hairs; proportions of costal sectors 2 to 4 in the ratio 19:14:9 to 33:22:15; *r-m* cross vein far distad of middle of discal cell, opposite 0.85 of its length; length of *m-m* 1.5x the distance between *r-m* and *m-m*; terminal sector of M_{1+2} evanescent and gradually diverging from that of R_{4+5}; anal corners slightly receding. Haltere yellow.

Legs: Slender with short yellow and dark hairs; coxae, femora and tibiae yellow with brown tinge in some areas under certain angles of illumination; tarsi yellow except for last tarsus of all legs; in some





Figs. 5-6: ***Semaranga subtriangularis*** **sp.n.**
5. Epandrium, posterior view
6. Phallic complex, ventral view

specimens most of fore tarsi appear a little infuscated under some angles of illumination; tibial organ long and narrow as in *dorsocentralis.*

Abdomen: Much longer than wide, predominantly blackish brown but rarely appearing more yellowish, subshiny, finely tomentose with a few well developed slender dark hairs, ovipositor short rather stout. Male genitalia (Figs 5-6): surstylus with median depression on distal margin; mesolobus large, medially concave distally with well developed hairs; hypandrium long and narrow; pregonite absent; postgonite more narrowly elongate than in *dorsocentralis* with a pair of stout black setae medially which are relatively shorter than in *dorsocentralis*; basiphallua and phallopodeme narrowly elongate with a slightly sclerotized plate at base of distiphallus.

Length: Male 2.2 - 2.7 mm; wing 2.0 - 2.4 mm
Female 2.3 - 3.4 mm; wing 2.3 - 2.7 mm

Holotype: ♂, Kerala: Trivandrum 8.5241° N, 76.9366° E Kariavattom. 25 m. 6.xi.2006. Coll. Jyothi Tilak. *Paratypes*: 1 ♀, Tamil Nadu: Palani Hills, 10.2000° N, 77.5000° E 27. iv. 1989. Coll. P.T. Cherian; 1 ♀(?), Karnataka: Bodipode: Biligiri 11.9956° N, 77.1428° E. WLS. 18 .iii. 1999. Coll. S. Krishnan; 1 ♂, Kerala: Trivandrum., Kariavattom. 25 m. 25. x. 2004, Coll. J. Jasmin; 1 ♀, Kerala: Wayanad Dist., Kabanigiri. 11.8574° N, 76.1812° E 750 m. 7 .i. 2006. Coll. A.K.Shinimol; 2 ♀, Kerala: Trivandrum Dist., Kariavattom. 25 m. 6.xi.2006. Coll. Jyothi Tilak; 1 ♀, Kerala: Trivandrum Dist., Veli. 10m. 2.xii.2007. Coll. Jyothy Tilak.

Remarks: *S. subtriangularis* shows close affinities to *dorsocentralis* Becker but in the former *ant* 3 is longer than wide, *ant* 2 is 2x as long as wide, scutellum is nearly subtriangular with more flattened disc, *as* are less widely separated at base and second sector of costa is 1.36 to 1.5x as long as third sector. But in *dorsocentralis ant* 3 is wider than long, *ant* 2 is not longer than wide, scutellum is with rounded oval distal margin and more convex disc, *as* are more widely separated at base and second sector of costa is only a trifle longer (11:10) than third sector. Besides, both species differ in relative development of male genitalia as shown in the figures.

ACKNOWLEDGEMENTS

I am grateful to the Science and Engineering Research Board, Ministry of Science and Technology, Government of India for financial support and to the Head of the Department of Zoology, University of Kerala for facilities for work. I am also thankful to Dr. M. Aja, Post Doctoral Fellow for taking the photographs.

ABBREVIATIONS

anepm - anepimeron, *anepst* - anepisternum, *ant* 2 - second antennal segment, *ant* 3 - third antennal segment, *as* - apical scutellar bristle, *dc* - dorsocentral bristle, *fr* - frontal hair, *h* - humeral bristle, *if* - interfrontal bristle, *ivt* - inner vertical bristle, *kepst* - katepisternum, *npl* - notopleural bristle, *oc* - ocellar bristle, *orb* - frontoorbital bristle, *ovt* - outer vertical bristle, *pa* - postalar bristle, *pvt* - postvertical bristle, *ss* - scutellar bristle, $R_{2+}3$- radius $_{2+3}$, R_{4+5} - radius $_{4+5}$, M_{1+2} - median vein$_{1+2}$.

REFERENCES

Andersson, H. (1977 Taxonomic and Phylogenetic studies on Chloropidae (Diptera) with special reference to Old World genera. Entomologica Scandinavica Suppelementum, 8, 1-200.

Becker, Th. (1911) Chloropidae. Eine monographische Studie III teil. Die Indo-Australische Region. Annales Historico-Naturales. Musei Nationalis, Hungarici, 9: 35-170.

Cherian, P.T. (1989) Some new genera of Oriental Chloropidae (Diptera). Oriental Insects, 23: 219-229.

Cherian, P.T. and Ambily, E.G. (2014) Studies on two new species of the genus *Elachiptericus* Becker (Diptera: Chloropidae: Mepachymerini) from the Oriental Region. Biosystematica, 8(1&2): 25-29.

Kanmiya, K. (1983) A systematic study of the Japanese Chloropidae (Diptera). Memoirs of the Entomological Society of Washington, 11: 3-370.

Nartshuk, E. P. (1983) A system of Superfamily Chloropoidea (Diptera: Cyclorrhapha). *Entomologicheskoe obozreni*, 62(3): 638-648. Zoologicheskogo Instituta Akademii Nauk USSR**,** 136: 1-280. (In Russian).

Sabrosky, C.W. (1951) Chloropidae *In*: Ruwenzori Expedition, 1934-35. 2: 711-828.

Sabrosky, C.W. (1977) Family Chloropidae. *In*: Delfinado, Hardy (Eds.) A Catalog of the Diptera of the Oriental Region. Volume III. Suborder Cyclorrhapha (excluding Division Aschiza). 3: 277-319.

(Received.29 June 2016; accepted 15 November 2016.; published 31 December 2016)