



First record of the genus *Gaurax* Loew (Chloropidae: Oscinellinae: Botanobiini) from India with descriptions of six new species

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ABSTRACT: The Genus *Gaurax* Loew is recorded for the first time from India. Six new species, *ammoni*, *bimaculatus*, *indicus*, *ninani*, *shillongensis* and *tomentosus* and an unnamed species are described from India. A key to Indian species of *Gaurax* is also given. © 2013 Association for Advancement of Entomology

KEYWORDS: Chloropidae, *Gaurax*, six new and an unnamed species.

INTRODUCTION

Andersson (1977) proposed the *Gaurax* group of genera and placed *Cestoplectus* Lamb, *Gaurax* Loew, *Gampsocera* Schiner and *Pseudogaurax* Malloch under the group which was later followed by Kanmyia (1983) and others. Nartshuk (1983, 1987) in her revisionary works on Chloropidae included 9 genera under the tribe Botanobiini when she erected the tribe. Apart from the four genera named above, she added five more namely, *Eugaurax* Malloch, *Hapleginella* Duda, *Leucochaeta* Becker, *Pselaphia* Becker and *Pterogaurax* Duda to the tribe. Of these nine genera, only four, *Cestoplectus* Lamb, *Gampsocera* Schiner, *Hapleginella* Duda and *Pseudogaurax* Malloch have been reported from India (Cherian, 2013).

Gaurax Loew is the largest genus of the tribe. It is distributed in all the Zoogeographical Regions. Becker (1911) reported many species of *Gaurax* from the Oriental Region, especially Taiwan (Formosa) to which were added a few more by Duda (1934) and others. Sabrosky (1977) included nineteen species from the Oriental Region, a few of which were later transferred to other genera but Kanmyia (1983) reported some more species from the Region. This genus has not so far been recorded from India. Six new species, besides an unnamed species, from India are described here. A key to species from India is also given.

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MATERIAL EXAMINED

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

RESULTS AND DISCUSSION

Genus *Gaurax* Loew

1863. *Gaurax* Loew, *Berl. Ent. Ztschr.*, **7**: 35 Type species: *Gaurax festivus* Loew. By monotypy.

1864. *Botanobia* Lioy, *Atti 1^a. Veneto Sci.* (3) **9**: 1125. Type species: *Botanobia dubia* (Macquart) (= *Oscinis dubia* Macquart, 1835). By monotypy.

1914. *Neogaurax* Malloch, *Canad. Ent.*, **46**: 119. Type species: *Neogaurax montanus* (Coquillett) (= *Gaurax montanus* Coquillett, 1898). By original designation and monotypy. Syn. Sabrosky, 1941.

Diagnostic Characters:

Head higher and wider than long; frons often thickly pubescent or hairy; frontal triangle smooth and shiny, reaching from middle to rarely anterior margin of frons; face with or without short carina in upper part; gena linear to narrow, usually silvery tomentose; vibrissal corner rounded; parafacialia not developed; *ant* 3 oval or reniform, much wider than long; arista slender with dense pubescence; eye very large, slightly to distinctly pubescent; *ovt* and *ivt* at times subequal; *pvt* and *oc* upright, cruciate; *orb* 5-8; *if* in a row along outer margin of frontal triangle; thorax black or yellow with black markings; scutum often with black maculae or dark stripes; pleura smooth and shiny with or without maculae; scutellum rounded, convex, black to yellow; thoracic bristles long and slender; *h* 1, *npl* 1+2, *pa* 1 and short *pa* 2 developed; *as* at times longer than scutellum, *ss* 1-2; wing hyaline or partly infuscated; second costal sector longer than the third; legs simple, partly darkened or wholly yellow; femoral organ absent; tibial organ distinct, oval; abdomen oval, wholly black to partly yellow, subshiny, tomentose with dark or rarely pale hairs; female cerci long and slender. Male genitalia: epandrium large, broad and rounded with a small orbicular dorsodistal opening; cerci bilobed, weakly developed, often long and produced ventrad; surstyli long with long hairs; hypandrium weakly developed, mostly of open type, without latero-distal bifurcation; gonites broadly attached to hypandrium, broad and elongate, without well defined suture between pre- and postgonites in most species.

Distribution: All the Zoogeographic Regions.

Remarks: *Gaurax* is closely related to *Gampsocera* Schiner. However, in the former *ant* 3 is

rounded or reniform, arista arises from dorsobasal part of *ant* 3, epandrium is broad and rounded with a small orbicular dorso-distal opening, cerci are separated and usually long and projecting, surstyli are of a complex nature with various projections and hypandrium, pregonites and postgonites are fused to form a complex structure. But in *Gampsocera* though the phallic complex is of the same rigid type as of *Gauraxi*, yet *ant* 3 is oblique with thickened, densely hairy, apically inserted arista, epandrium is flat and apically broad, surstyli are simple and there are only indistinct traces of cerci.

Gaurax is a very large and speciose genus known by ninety seven species from the world (Encyclopedia of Life, 2013) and is distributed in all the faunal regions. However, it has not been reported from India. 6 new and an unnamed species from India are described here. A key to Indian species is also given.

Key to species of *Gaurax* Loew from India:

1. Wing with marginal infuscation extending from base to ending of R2+3 or from R1 to R2+3.....2
 Wing without such infuscation, either colourless or partly diffusely brown.....3
2. Marginal infuscation of wing extends from R1 to ending of R2+3; wing deeply infuscated at sides of R4+5 along about two-thirds its length basally; discal cell greatly widening distally with greatly convex m-m cross-vein which bears a tuft of black hairs medially on either side; second posterior cell with a short, black spine in upper half submedially.....*Gaurax* sp.
 Anterior marginal infuscation of wing extends from base to ending of R2+3; wing without infuscation along sides of R4+5; discal cell and m-m cross-vein normally developed, the latter without black hairs; spine on second posterior cell absent*ninani* Cherian sp. n.
3. Occiput and *ant* 3 yellow; pleura black, only brownish yellow anteriorly; legs almost wholly yellow.....*shillongensis* Cherian sp. n.
 Occiput partly or entirely dark brown to black, *ant* 3 at least partly infuscated; pleura entirely black or wholly yellow with black macula covering at least part of *anepm*; at least hind femora or hind tibiae partly dark brown.....4
4. Face yellow; gena yellow or reddish brown; pleura yellow with black maculae at least on *anepm*; femora predominantly yellow, at most weakly infuscated dorsally and ventrally.....5

Face and gena deeply infuscated to brownish black; pleura almost entirely black to brownish black; femora predominantly black or partly infuscated.....6

5. Gena yellow; frontal triangle and vertex margin yellow, its width in the middle half that of *ant* 3; scutum black with yellow sides and two large yellow maculae, one each in the area of *1dc* which extends to scutellar margin..... *bimaculatus* Cherian sp. n.

Gena yellowish brown, its width in the middle about one fourth that of *ant* 3; frontal triangle and vertex margin entirely black; scutum dorsally wholly black.....
.....*indicus* Ambily sp. n.

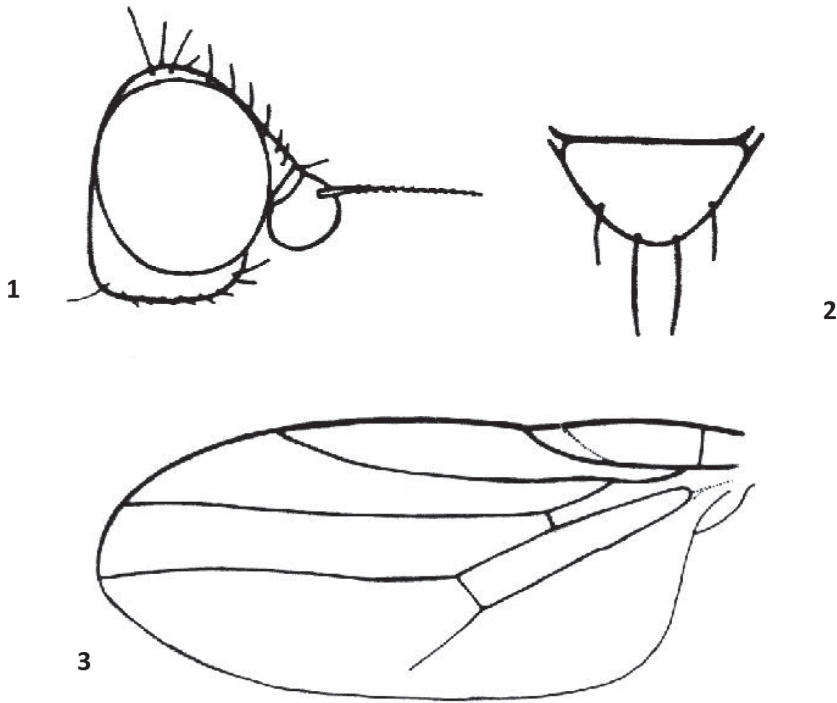
6. Frontal triangle, large, subshiny, reaching nearly anterior margin of frons and partly yellow in front of ocellar tubercle; eye with scattered fine pubescence; gena dull black; scutum subshiny, very weakly and finely tomentose; all femora predominantly brownish black.....*ammoni* Cherian sp. n.

Frontal triangle dull, densely tomentose, not reaching beyond three-fourths length of frons, dull brownish black in front of ocellar tubercle and yellow at sides and anteriorly; eyes densely and conspicuously pubescent; gena dull brownish yellow, grey tomentose; femora only partly infuscated
.....*tomentosus* Cherian sp. n.

***Gaurax shillongensis* Cherian sp. n. (Figs.1-3)**

Female: Head (Fig.1): Higher than long, length height and width ratio 9:11:14. Frons weakly narrowing anteriorly, a trifle widening at vertex, width at point of widening 0.53x that of head and 1.15x its own length, weakly tomentose, yellow with pale *fr* and ending with straight anterior margin; frontal triangle distinctly demarcated, shiny golden yellow, reaching a little behind anterior margin of frons and ending with nearly pointed apex. Face short, narrow, concave, yellow and finely tomentose; epistomal margin convex; facial carina triangular between bases of antennae and not extending beyond. Antennae erect, yellow; basal segments short; *ant* 3 reniform, 1.4x as wide as long; arista brown with short brown pubescence. Gena and postgena yellow, finely tomentose, the former narrowing anteriorly, width in the middle at most about 0.4x that of *ant* 3; vibrissal corner rounded, receding. Eye large with very fine, very short dense pubescence and nearly vertical long axis; occiput yellow. Proboscis short, brownish; palpi yellow with fine hairs. Head bristles yellow; *ovt* longer than *ivt*; *pvt* and *oc* cruciate, the latter shorter than *ivt*; *orb* 6, well developed, reclinate but posterior most one a trifle proclinate; *if* in a row of about 6, outside margin of frontal triangle.

Thorax: Scutum as long as wide and as wide as head, finely grey tomentose, subshiny yellowish brown but for darkened sides and three weakly demarcated blackish brown longitudinal bands commencing behind neck and reaching about two-thirds its length; posterior part of convex scutum also partly infuscated so that scutum appears darkened medially. Pleura dull brownish black, finely tomentose. Scutellum (Fig. 2) 0.7x as long as wide, yellowish brown but partly infuscated, disc convex bearing short brownish yellow hairs as on scutum. Thoracic bristles



Figs. 1-3: *Gaurax shillongensis* sp.n. 1. Head- profile; 2. Scutellum; 3. Wing

with slender *h* 1, 1+2 *npl*, *pa* 1, short *pa* 2 and normally developed 1 *dc*; *as* a little shorter than scutellum; *ss* 1 two-thirds as long as *as*; distance between bases of *as* and *ss* 1 more than that between bases of *as* bristles.

Wing (Fig. 3): 2.5x as long as wide, hyaline with pale brown veins; proportions of costal sectors 2 to 4 in the ratio 7:5:3; r-m cross-vein distad of middle of discal cell, opposite 0.6 of its length; terminal sectors of R4+5 and M1+2 not parallel, the former straight and the latter gradually becoming convex above medially and joining costa beyond apex of wing, anal area moderately developed. Haltere yellow but knob medially faintly infuscated.

Legs: Slender, of medium size, almost wholly yellow except for darkened hind coxa and brownish tinge antero-dorsally and antero-ventrally on hind femur; tibial organ oval with pale fine pubescence.

Abdomen: Suboval, brownish black with diffused faint yellow tinge on dorsum of some terga and more so on sterna, weakly tomentose with short pale hairs. Ovipositor broad basally and gradually narrows terminally, entirely brownish black.

Length: ♀ 1.8 mm; wing 1.88 mm.

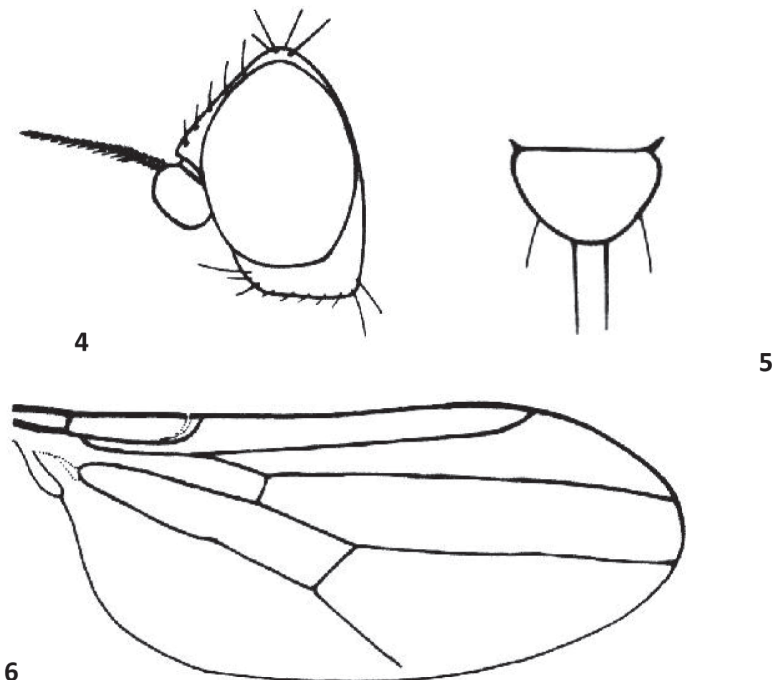
Holotype: ♀, India: Meghalaya: Shillong: Elephant Falls, 1350 m, 5 .vii.1979, Coll. P.T. Cherian.

Etymology: This species derives its name from its place of collection

Remarks: *G. shillongensis* comes close to *G. rubicundulus* Frey from the Philippines. However, in *shillongensis* second costal sector is only 1.4x as long as third sector, r-m cross vein is distad of middle of discal cell and terminal sectors of R4+5 and M1+2 are not parallel and the latter is convex above medially where as in *rubicundulus* second costal sector is about 2x as long as third sector, r-m cross vein joins discal cell somewhat in its middle and terminal sectors of R4+5 and M1+2 are parallel.

***Gaurax ninani* Cherian sp. n. (Figs. 4-6)**

Female: Head: (Fig. 4): Much higher than long, length height and width ratio 11:13:16. Frons narrowing anteriorly, width at vertex a little less than half that of frons and subequal to its own length, dull brownish yellow, grey tomentose and with short pale *fr*; frontal triangle subshiny blackish brown with yellow sides, reaching middle of frons and ending with obtuse apex. Face



Figs. 4-6: *Gaurax ninani* sp.n. 4. Head- profile; 5. Scutellum; 6. Wing

narrow, deeply concave, dull brownish yellow; facial carina triangular between bases of antennae, low and reaches nearly middle of face whence it fades off. Basal antennal segments a little infuscated; *ant* 3 yellow, reniform, 1.4x as wide as long; arista basally a little thickened with well developed pubescence. Gena in the middle about 0.4x as wide as *ant* 3, yellowish brown with dark tinge along oral margin; vibrissal corner receding, rounded; postgena narrow infuscated. Proboscis and palpi short and infuscated. Eye large, pubescence dense but longer than in *shillongensis*, with vertical long axis. Head bristles yellow; chaetotaxy similar to that of *shillongensis* but *orb* about 5, reclinate.

Thorax: A trifle narrower than head, dull brownish black and densely tomentose. Scutum 0.9x as long as wide with short, fairly dense pale hairs; pleura without maculae. Scutellum (Fig. 5) 1.33x as wide as long, rounded with weakly convex disc bearing hairs as on scutum. Thoracic bristles with *h* 1, 1+2 *npl*, 1 *pa*, 1 *dc* and hair-like *pa* 2; *as* shorter than scutellum; *ss* 1 about two-thirds as long as *as*; distance between bases of *as* much less than that between *as* and *ss*1.

Wing (Fig. 6): 2.8x as long as wide; proportions of costal sectors 2 to 4 in the ratio 22:11:5; r-m cross-vein far distad of middle of discal cell opposite about 0.65 of its length; m-m cross-vein strongly oblique; terminal sectors of R4+5 and M1+2 early parallel but weakly convergent distally, the latter joining costa a trifle beyond apex of wing; costal and subcostal cells entirely, basal radial cell partly and MG3 and MG4 along their borders infuscated. Haltere yellow.

Legs: Coxae partly darkened; fore and mid femora yellow but one-third their lengths distally blackish brown; hind femora and fore and hind tibiae predominantly darkened; mid tibia partly dark brown and partly yellow; basal tarsi of all legs yellow and distal segments infuscated.

Abdomen: Oval, brownish black with distal segments partly yellow, wholly with short pale hairs. Ovipositor short with a few hairs.

Length: ♀ 1.87mm; wing 1.84mm.

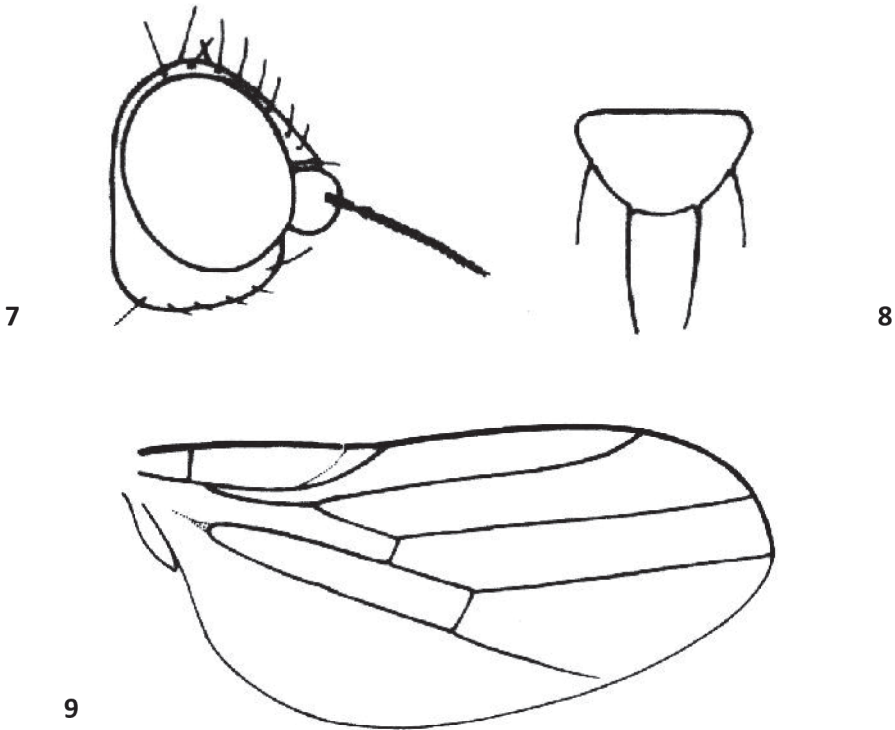
Holotype: ♀, India: Tripura: Maichera, 27.ix.1977, Coll. T.N. Ninan.

Etymology: This species is named after the collector of the specimen.

Remarks: *G. ninani* shows affinities to *shillongensis* but differs in frontal triangle reaching only middle of frons and in having partly infuscated wings and partly darkened legs where as in the latter species frontal triangle reaches nearly anterior margin of frons, wings are not infuscated and legs are almost wholly yellow.

***Gaurax amnoni* Cherian sp. n. (Figs. 7-9)**

Male: Head (Fig. 7): Only a little higher than long, length height and width ratio



Figs. 7-9: *Gaurax amnoni* sp.n. 7. Head- profile; 8. Scutellum; 9. Wing

6:7:11. Frons gradually widening posteriorly, width at vertex 0.55x that of head and about 1.4x its own length, dull dark brown but for blackened vertex margin and brownish yellow tinge at sides of lateral margins of frontal triangle, with a few short *fr*; frontal triangle clearly demarcated, more than two-thirds as wide as frons at vertex, shiny brownish yellow except for black ocellar tubercle, ventral margin and posterior-lateral sides, reaching a little behind anterior margin and ending with nearly pointed apex. Face narrow, higher than wide, dark tomentose, dull brownish black; epistomal margin convex medially and projecting forwards; facial carina triangular between bases of antennae and not extending beyond. Basal antennal segments darkened; *ant* 3 reniform, 1.4x as wide as long, brownish yellow but darkened along anterior-distal margin and the area around; arista a little thickened at base, of medium length, dark brown with concolorous pubescence. Gena narrowing anteriorly, width in the middle about half that of *ant* 3, dull black, silvery tomentose; vibrissal corner rounded, receding; postgena concolorous with gena. Occiput dull black. Proboscis and palpi dull black, the former shortened. Eye large, oval with vertical long axis and very scattered pubescence. Head bristles brownish black, chaetotaxy similar to that of *ninani*.

Thorax: Scutum a little narrower than head, nearly as long as wide, subshiny black, weakly

tomentose with short dark pubescence. Pleura dull black, dark tomentose, without maculae. Scutellum (Fig. 8) 0.7x as long as wide, rather narrowly rounded with weakly convex disc which is concolourous with and tomentose and pubescent like scutum. Thoracic bristles black with 1 *h*, 1+2 *npl*, 1 *dc*, *pa* 1 and short *pa* 2 bristles; *as* a little longer than scutellum, fairly widely separated at base; *ss*1 two-thirds as long as *as*; distance between bases of *as* and that between bases of *as* and *ss*1 subequal; all scutellar bristles borne on fine warts.

Wing (Fig. 9): Hyaline with pale brown veins; costal sectors 2 to 4 in the ratio 8:5:3; r-m cross-vein distad of middle of discal cell opposite 0.62 of its length; terminal sectors of R4+5 and M1+2 subparallel; anal area moderately developed. Halteres infuscated.

Legs: Coxae black; hind femur entirely, but for faint yellow tinge at distal end, brownish black; mid-femur predominantly and fore-femur mostly blackish brown except for partly diffused faint brownish yellow tinge; tibiae mostly yellow with faint brown tinge especially on hind tibia; tarsi yellow; tibial organ distinct.

Abdomen: Subshiny brownish black with a few short hairs.

Length: ♂: 2.0 mm; wing: 1.9 mm

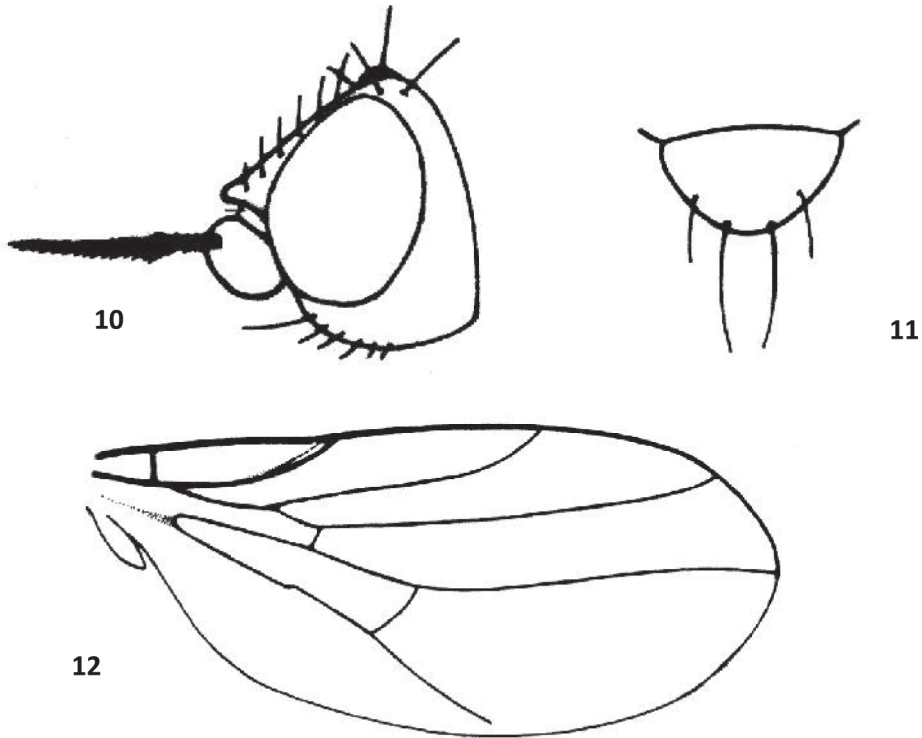
Holotype: ♂, India, Meghalaya; Nangpo, 535 m, 23.iv.1980, Coll. Amnon Freidberg.

Etymology: The species is named in honour of Dr. Amnon Freidberg, Tel Aviv University, Israel, who had collected and donated the specimen for study.

Remarks: *G. ammoni* keys near *shillongensis* but in the former occiput is black, *ant* 3 is partly infuscated, pleura is entirely black, frontal triangle is black at vertex margin and femora are predominantly blackish brown whereas in *shillongensis* occiput and *ant* 3 are yellow, pleura is brownish yellow anteriorly, frontal triangle is almost entirely yellow and legs are almost wholly yellow.

***Gaurax tomentosus* Cherian sp. n. (Figs.10-12)**

Male: Head (Fig. 10): As long as high, length, height and width ratio 11:11:16; frons slightly narrowing anteriorly, widening at vertex, width at point of widening half that of head and 1.1x its own length, brownish yellow, finely grey tomentose with short dark finely punctate hairs and ending with slightly convex anterior margin; frontal triangle subshiny, brownish black but for yellow sides and anterior part, its width at vertex about two thirds that of frons, finely grey tomentose, reaching almost two-thirds length of frons and ending with narrowly obtuse apex. Face deeply concave, dull brownish yellow with dark tinge in some areas; facial carina low, triangular between antennae and not extending much beyond. Antennae erect, basal segments brownish yellow; *ant* 3 reniform, 1.4x as wide as long, yellow but deeply infuscated along dorsodistal margin; arista brownish black with dense, conspicuous, concolourous slender hairs. Gena dull brownish yellow with dark tinge along oral margin, narrowing anteriorly,



Figs. 10-12: *Gaurax tomentosus* sp. n. 10. Head- profile; 11. Scutellum; 12. Wing

width in the middle about one-third that of *ant* 3; vibrissal corner receding, not reaching anterior margin of eye; oral vibrissae well developed; oral setae about 7-8, slender but very conspicuous; postgena well developed, darkened posteriorly and concolourous with gena anteriorly. Eye large, densely and conspicuously pubescent with nearly vertical axis. Proboscis and palpi darkened with fine hairs. Head bristles well developed, brownish black; vertex margin with a row of dark hairs; *ovt* and cruciate *ivt* subequal, *ivt* a little shorter than *ovt* and subequal to longest *orb*; *oc* about half as long as *pvt*, reclinate; *orb* 6 as in *G. ammoni*; *if* in a row about 5-6 along outside margin of frontal triangle, shorter than *orb*.

Thorax: Almost wholly brownish black. Scutum a little narrower than head, nearly as long as wide, dull brownish black, densely grey tomentose but anterior part partly appears having golden yellow tinge in certain angles of illumination. Scutellum (Fig. 11) about 1.5x as wide as long with convex disc which is concolourous with and pubescent like scutum. Pleura concolourous with scutum except for subshiny propleuron and lower and posterior parts which are with light yellow tinge. Thoracic bristles black with 1 *h*, 1+2 *npl*, 1 *dc*, *pa* 1 and *pa* 2, bristles as in *ninani*; *as* 1.2x as long as scutellum, widely separated at base; *ss* 1, 0.6x as long as *as*; distance between bases of *as* and *ss* 1 subequal.

Wing: (Fig. 12): 2.25x as long as wide, hyaline with pale brown veins; proportions of costal sectors 2-4 in the ratio 30:22:13, r-m cross-vein distad of middle of discal cell, opposite 0.56 of its length; terminal sectors of R4+5 and M1+2 gradually diverging distally, the latter weakly sinuate and slightly convex above medially; m-m cross-vein oblique; anal area a little receding. Haltere yellow but partly infuscated.

Legs: Predominantly yellow with diffused dark tinge especially on fore and hind femora and some areas of tibiae, tibial organ developed.

Abdomen: Suboval, subshiny brownish black but for faint yellow tinge medially on dorsum of basal segments, weakly tomentose with fairly dense well developed black hairs especially on distal segments.

Length: ♂ 1.46 mm; wing 1.56 mm.

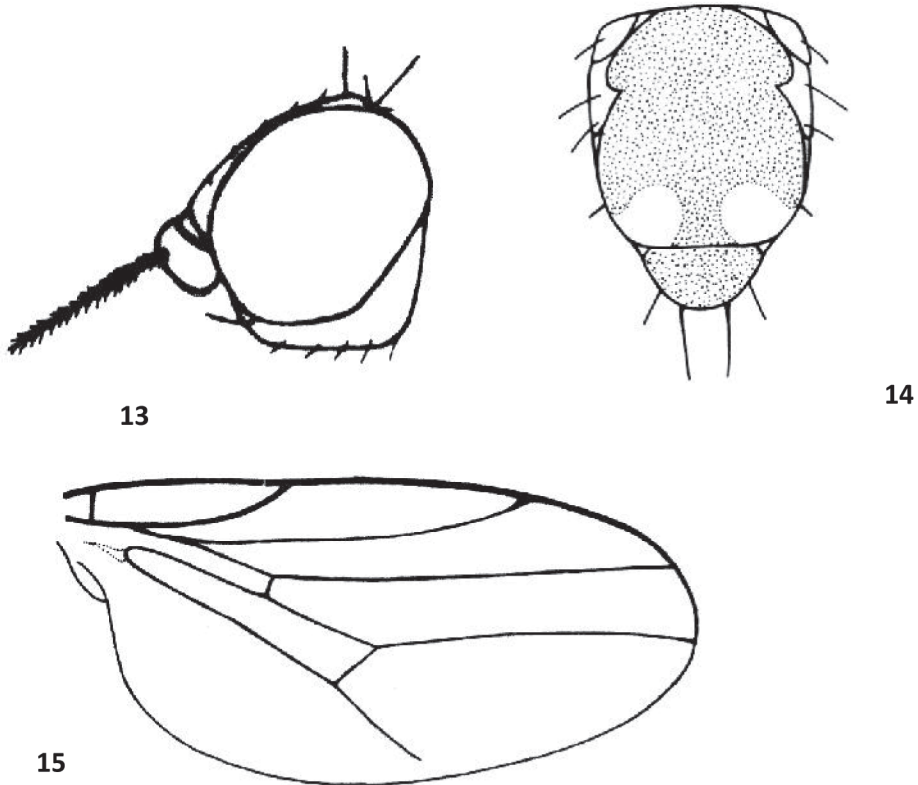
Holotype: ♂, India: Kerala: Ernakulam Dt., Vazhakulam, 14.viii.2011, Coll: E.G. Ambily

Etymology: *G. tomentosus* derives its name from its densely tomentose frontal triangle.

Remarks: *G. tomentosus* shows affinities to *G. ammoni* but in the former frontal triangle is dull, densely tomentose and reaches not beyond three-fourths length of frons, eyes are densely and conspicuously pubescent, gena is dull brownish yellow, scutum is dull and densely grey tomentose, femora are only partly infuscated and *ss* 2 is present. But in *G. ammoni* frontal triangle reaches nearly anterior margin of frons, eye is with scattered fine pubescence, gena is dull black, scutum is subshiny and very weakly and finely tomentose, femora are predominantly brownish black and *ss* 2 is absent.

***Gaurax bimaculatus* Cherian sp. n. (Figs. 13-15)**

Male, female: Head (Fig. 13): Length height and width ratio 6:7:9. Frons nearly parallel-sided but widening at vertex, width at point of widening 0.55x that of head and 0.9x its own length, finely pale tomentose, yellow with fine concolourous *fr*; frontal triangle clearly demarcated, large, glabrous, about three-fourths length of frons and ending with narrowly obtuse apex, concolourous with frons except for brown tinge in front and sides of deeply infuscated ocellar tubercle. Face deeply concave, finely grey tomentose, yellow; epistomal margin convex, and projecting medially, with dark rim; facial carina weak, triangular between bases of antennae and not extending beyond. Basal antennal segments yellow; *ant* 3 reniform 1.4x as wide as long, yellow but darkened in upper half, basally and along dorso-distal margin; arista basally slightly thickened, dark brown with short, concolourous pubescence; gena narrowing anteriorly, width in the middle about half that of *ant* 3, pale tomentose, yellow; vibrissal corner rounded, a little receding; postgena confined to lower half of head posteriorly, concolourous with gena. Eye large, almost naked; occiput darkened below yellow vertex margin. Proboscis short, darkened; palpi yellowish brown. Head bristles yellow; *ovt*, *ivt*, *pvt* and *oc* as in *G. ammoni*; *orb* about 6; *if* as in *G. ammoni*.



Figs. 13-15: *Gaurax bimaculatus* sp.n. 13. Head- profile; 14. Scutellum; 15. Wing

Thorax: Scutum 1.15x as long as wide, shiny, weakly tomentose with convex black disc which is yellow at sides and with 2 large yellow maculae posteriorly, each on either side in the area of *1dc* and extending to posterior margin of scutum with a median black area in the form of a black band, in one specimen maculae are larger and longer; humeral callus well developed, yellow with brown tinge medially, especially in one specimen. Pleura subshiny yellow with nearly oval black maculae on *anepm* and brownish macula on *kepst*. Scutellum: (Fig. 14) broadly rounded, 1.35x as wide as long, with weakly convex, black, finely tomentose disc; thoracic hairs yellow and thoracic bristles dark brown; *h1* short; *npl* 1+2, subequal; *pa* 1 and *1dc* subequal and equal to *npl*; *pa* 2 hair-like; *as* a little longer than scutellum; *ss* 1 two-thirds as long as *as*; distance between bases of *as* and that between *as* and *ss* 1 subequal.

Wing (Fig. 15): 2.3x as long as wide, hyaline with brown costa and brownish yellow veins; proportions of costal sectors 2 to 4 in the ratio 18:12:7; r-m cross-veins joining at four-sevenths length of discal cell from base; terminal sectors of R4+5 and M1+2 subparallel, the former slightly diverging distally before joining costa, the latter joining costa at apex of wing. Haltere yellow.

Legs: Predominantly yellow but hind tibia along one-third its length basally, especially in the holotype, darkened; mid and hind femora with deep brownish tinge along antero-dorsal and posterior-ventral surfaces; tibial organ developed; femoral organ absent.

Abdomen: Short, much narrower than thorax, female cerci long, slender, yellow. Male genitalia partly damaged.

Length: Male 1.72 mm; wing 1.84 mm.

Female: 1.88 mm; wing 2 mm.

Holotype: ♀ : Tamil Nadu : Periyar Dist., Gathisal, 5.i.1990, Coll. P.T. Cherian

Paratype: ♂ : Tamil Nadu : Coimbatore Dist., Kunjapanai, 1200 m, 9.ii.1992, Coll. C. Radhakrishnan.

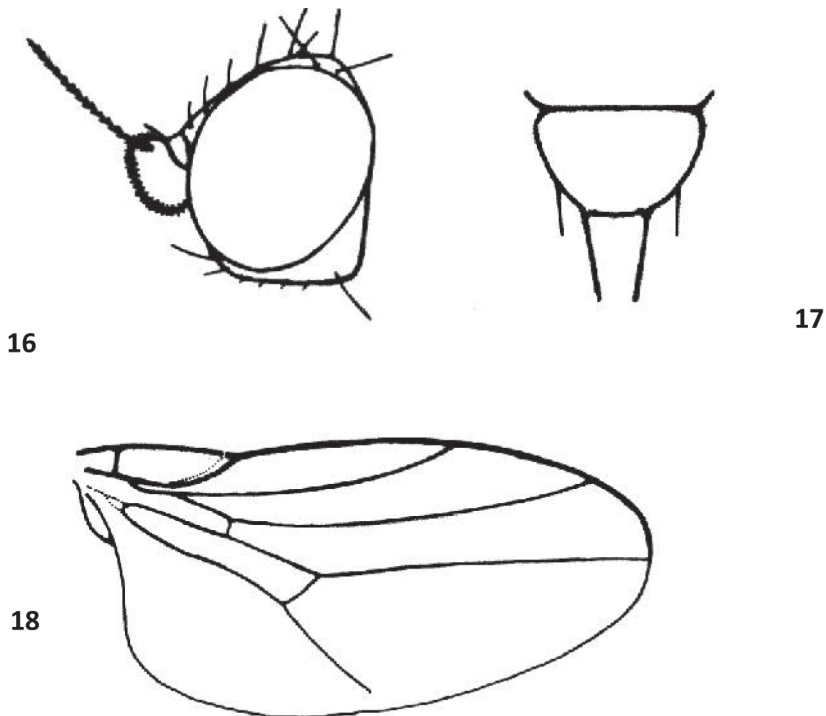
Etymology: The species derives its name from the two yellow maculae on scutum.

Remarks: *Gaurax bimaculatus* shows affinities to *amnoni* but in the former gena and face are yellow, scutum is with two large yellow maculae posteriorly, sides of scutum, much of pleura, coxae and much of femora are yellow and abdomen is short and narrow. But in *amnoni* gena, face and thorax are entirely black, coxae wholly and femora predominantly are black and abdomen is normally developed.

***Gaurax indicus* Ambily sp. n. (Figs. 16-18)**

Female: Head (Fig. 16) Length, height and width ratio 15:19:26. Frons slightly widening at vertex, width at point of widening subequal to its own length and two-thirds width of head, sunken in middle, yellow with slight reddish tinge and a few dark brown *fr*. Frontal triangle large, shiny brownish black, reaching about three-fourths length of frons and ending with narrowly obtuse apex. Face concave medially, weakly tomentose, yellow with narrow brownish black epistomal margin which is with sublinear dark brown horizontal marginal band. Gena yellowish brown, narrowing anteriorly, width in the middle one-fourth that of *ant3*; vibrissal corner receding; postgena reduced, concolourous with gena. Basal antennal segments darkened, *ant 2* with conspicuous dorsal spine, *ant 3* reniform, 1.4x as wide as long, grey tomentose, brownish yellow in lower half and deeply infuscated in upper half and along dorso-distal margin; arista long and slender, blackish brown with fairly dense concolourous hairs; occiput shiny brownish black. Palpi and proboscis yellow. Eye large with nearly vertical long axis and fine, very scattered pubescence. Head bristles slender, dark brown, almost similar to that in *biocellatus* but *orb 5* of which anterior most two are short and the rest nearly subequal.

Thorax: Scutum about 0.8x as long as wide, shiny black but for partly yellow humeral callus and sides upto transverse suture, disc weakly convex with slender fairly dense, pale yellow



Figs. 16-18: *Gaurax indicus* sp.n. 16. Head- profile; 17. Scutellum; 18. Wing

hairs. Pleura yellow with narrow longitudinal brownish black band on *anepst*, part of *anepm* and much of the area of meron. Scutellum (Fig. 17) about 1.2x as wide as long, rounded distally with weakly convex disc which is concolourous with and pubescent like scutum; thoracic bristles dark brown, bristles on scutum similar to those of *biocellatus*; *as* a little shorter than scutellum; *ss* 1 about 0.4x as long as *as*; distance between bases of *as* and *ss* 1 nearly subequal.

Wing (Fig. 18): 2.2x as long as wide, hyaline with pale brown veins; proportions of costal sectors 2-4 as 12:7:5; *r-m* cross-vein distad of middle of discal cell, opposite 0.57 of its length; *m-m* cross-vein oblique; terminal sectors of R4+5 gradually becoming concave above along its entire length, turning upwards before joining costa and that of M1+2 nearly straight so that R4+5 is divergent from M 1+2 distally. Anal area of wing normally developed; haltere pale yellow.

Legs: Slender, predominantly pale yellow but mid femora weakly and hind femora partly with diffused dark brown tinge; tibial organ developed.

Abdomen: Short but medially nearly as broad as thorax, shiny brownish black but for broadly v-shaped yellow area covering broadly the first and narrowly in the middle of second basal

segments; hairs on abdomen slender, dark brown; female ovipositor very slender, brownish black.

Length: ♀ 1.4 mm; wing 1.3 mm.

Holotype: ♀, Kerala: Trivandrum Dist; Pangapara, 25 m, 24.ix.2011, Coll. E.G. Ambily.

Etymology: The species derives its name from the name of the country of its distribution.

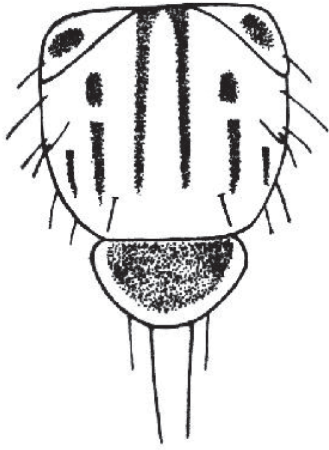
Remarks: *G. indicus* keys near *bimaculatus* but in the former frontal triangle and vertex margin are black to brownish black, gena is yellowish brown and its width in middle is only one-fourth that of *ant* 3 and scutum dorsally is wholly black whereas in *bimaculatus* frontal triangle and vertex margin are yellow, gena is yellow and is half as wide as *ant* 3 and scutum is with two large yellow maculae posteriorly, one each in the area of *1dc*.

***Gaurax* sp.** Fig. (19-20)

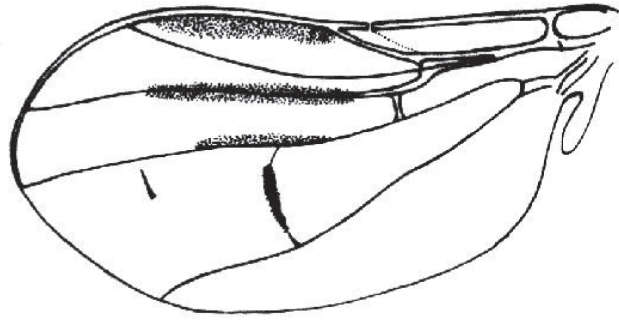
A specimen, the head of which is lost, apparently appears to belong to *Gaurax*. It is not named but described here because of some unique characters of its wing not seen in other species of Chloropidae.

Thorax: Scutum about 1.2x as wide as long, densely and conspicuously grey tomentose, brownish yellow with four posteriorly separated brownish black longitudinal stripes of which two median ones commence at neck and are abbreviated posteriorly at level of *1dc* and each lateral one begins from level of lower margin of humeral callus, is broadly interrupted at transverse suture and ends posteriorly a little below termination of middle ones; apart from four stripes, two each on each side of scutum, there is a short narrow, less distinct dark stripe laterally, commencing from humeral callus and fading off behind base of *pa* 2; scutum convex anteriorly and a little flattened medially and posteriorly, wholly with dense well developed pale hairs; humeral callus well developed, distinctly marked off from scutum, brownish yellow but infuscated medially. Pleura subshiny, almost polished reddish brown but for partly tomentose infuscated *anepst* which is with a shiny black macula along its lower posterior margin. Scutellum (Fig. 19) rounded, 1.2x as wide as long, weakly convex, dark brown in upper half and brownish yellow in lower half and along sides, tomentose and pubescent like scutum. Thoracic bristles well developed, brownish black; *h* 1 shorter than anterior *npl*; *npl* 1+2 anterior one a little longer and posterior 2 subequal; *pa* 1 and 1 *dc* subequal to *npl*; *pa* 2 hair-like; *as* 1.2x as long as scutellum; widely separated at base; *ss* 1 about 0.6x as long as *as* but slender, distance between bases of *ss* 1 and *as* less than that between *as*.

Wing (Fig. 20): Only 1.9x as long as wide, widened medially than at anal area; proportions of costal sectors 2 to 4 in the ratio 16:11:6; r-m cross-vein in the middle of discal cell; terminal sectors of R4+5 and M1+2 convex above submedially and slightly diverging distally; M1+2 convex above submedially and slightly diverging distally; M3+4 medially concave below and



19



20

Figs. 19-20: *Gaurax* sp. 7. Scutellum; 8. Wing

a little convex above distally before joining costal margin; discal cell greatly broadened distally unlike in normal species of *Gaurax*; m-m cross vein greatly convex outwards medially and is with a tuft of prominent black hairs medially above and below; second posterior cell with a short black spine in upper half submedially; marginal infuscation of wing extends from R1 to R2+3 and the area below; wing deeply infuscated at sides of terminal sector of R4+5 along about two-thirds its length basally. Vein R1 with a very short incomplete cross- vein like extension at the bifurcation of R2+3 and R4+5, almost connecting the veins on in some species like *Dasyopa scutellata* (von Roser). Haltere yellow with partly brown stalk.

Legs: Yellow but for diffused brown patches of femora and tibiae; hind femora a little swollen.

Abdomen much narrower than thorax, dull brownish black except for yellow colouration submedially on terga of basal segments; hairs on abdomen short, yellow, fairly dense. Male genitalia fairly large, bends and turns forwards, with conspicuous hairs.

Specimen Studied: ♂ (head fallen off) India, Kerala: Trivandrum Dist., Kariavattom, 25m; 13.xii.2005, Coll. P.T. Cherian.

Remarks: This species (the head of the specimen is lost) appears to belong to *Gaurax* in respect of some body characters, especially of thorax. However it differs from typical species of *Gaurax* in the development of its wing. Its wing is a trifle less than 2x as long as wide, discal cell is greatly widened distally, m-m cross vein is convex above medially and is with a tuft of black hairs above and below medially, M4+5 joins costal margin and there in a short black spine in upper half submedially on second posterior cell. Such a combination of characters is

not found in other species of *Gaurax* or other Chloropid flies. This species may belong to an entirely different genus but cannot be stated with exactitude without studying the characters of its head.

Abbreviations

anepm – anepimeron; *anepst* – anepisternum; *ant 1* - first antennal segment; *ant 2* - second antennal segment; *ant 3* - third antennal segment; *as* - apical scutellar bristle; *1 dc* - first dorsocentral bristle; *fr* - frontal hair; *h* - humeral bristle; *if* – inter frontal bristle; *ivt* - inner vertical bristle; *kepst* – katepisternum; *npl* -notopleural bristle; *oc* - ocellar bristle; *orb* – fronto-orbital bristle; *ovt* - outer vertical bristle; *pa* -postalar bristle; *pvt* - postvertical bristle; *ss* - subapical scutellar bristle; R2+3- radius 2+3; R4+5- radius 4+5; M1+2- median vein 1+2. MG3- 3rd costal segment; MG4- 4th costal segment.

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