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## Revision of genus *Cerais* VAN DER WULP (Diptera: Chloropidae: Chloropinae: Mindini) with description of two new species from India

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**Abstract.** *Aragara* WALKER is placed under the tribe Mindini and *Aragara magnicornis* (VAN DER WULP) is transferred back from *Aragara* to *Cerais*. Genus *Bathyparia* LAMB is synonymised with *Cerais* VAN DER WULP and *Cerais ponti* and *Cerais travancorensis*, two new species from India, are described. A key to species of *Cerais* of the world is also given. This is the first record of the genus from India.

**Key words:** Diptera, Chloropidae, Chloropinae, *Aragara*, *Bathyparia*, *Cerais ponti* sp.n., *C. travancorensis* sp. n., India.

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### I. INTRODUCTION

Mindini PARAMONOV (1957), known by sixteen genera (NARTSHUK 1983, 1987), is the largest of the eight tribes of subfamily Chloropinae in terms of genetic diversity. Eleven of these genera are represented in the Oriental Region, of which only five – namely *Eutropha* LOEW, *Cordylosomides* STRAND, *Merochlorops* HOWLETT, *Thaumatomyia* ZENKER and *Thressa* WALKER – have been reported from India.

While revising the genera of the tribe Chloropini of India and adjacent countries the authors came across two new species of which one shows characters intermediate between those of the genera *Bathyparia* LAMB (1917), known only by the type species *B. praeclara* LAMB, and *Cerais* VAN DER WULP, represented by four known species in the world. Based on the study and comparison of species of both the genera and one of the new species it is evident that they are all congeners. Hence *Bathyparia* is considered a junior synonym of the older name *Cerais* and *B. praeclara* is transferred to *Cerais*. Thus only 15 of the 16 genera recognized by NARTSHUK under Mindini are considered valid.

*Aragara* WALKER is a small genus known by seven species, of which *magnicornis* (VAN DER WULP) is here transferred back to *Cerais*. This genus has not been placed under any tribe of Chloropidae. Based on the study of this genus and related genera of tribe Mindini,

it is apparent that *Aragara* belongs to this tribe and hence is hereby placed under Mindini, thereby recognizing 16 genera under the tribe.

## II. MATERIALS

Out of a large number of specimens in the depositories of the Head Office and Regional Centres of the Zoological Survey of India and in the personal collections of the first author, we came across two new species belonging to the rare genus *Cerais* from the southern states of India. The specimens are mounted on pins and the male genitalia are mounted on slides.

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

Abbreviations for morphological structures:

(Morphology nomenclature is followed after MC ALPINE in MC ALPINE et al. (1981).

*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* – interfrontal 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

MES – mesolobus

PH S – phallapodemic sclerite

POG – postgonite

PRG – pregonite

SUR – surstylus

R2+3 – radius 2+3

R4+5 – radius 4+5

M1+2 – median vein 1+2

## III. SYSTEMATICS

Genus *Cerais* VAN DER WULP

*Cerais* VAN DER WULP, 1881. Midden Sumatra Expedition, **4**: 54. Type species: *Cerais magnicornis* VAN DER WULP. By monotypy.

*Euryparia* BECKER, 1911. *Annales historico-naturales Musei nationalis hungarici* Budapest. Type species: *Euryparia rara* BECKER. By Monotypy. Synonym by ANDERSSON, 1977.

*Bathyparia* LAMB, 1917. *Annual Magazine of Natural history*; (8) **19**: 56. Type species: *Bathyparia praeclara* LAMB. By Monotypy. **Syn. n.**

*Euriparia* NARTSHUK, 1963. *Entomologicheskoe obozrenie*, **42**: 671. Error for *Euryparia* BECKER (SABROSKY, 1964).

**E m e n d e d d i a g n o s i s.** Head nearly as long as high or higher than long; frons projecting beyond anterior margin of eye, widening at vertex, silvery white tomentose and with whitish *fr*; frontal triangle almost as wide as to very rarely half as wide as frons at vertex, partly or wholly tomentose except for shiny mid-longitudinal streak to rarely wholly smooth and shiny; face long and rather narrow with or without narrow facial carina reaching middle of face; *ant 2* longer than wide; *ant 3* much longer than wide, rectangular to shoe-shaped; arista short, bare or with fine pubescence; parafacialia broad to indistinct; eye relatively small, suboval to subspherical, bare or with fine scattered pubescence; gena hairy, much wider than *ant 3*; vibrissal corner not reaching or slightly projecting beyond anterior margin of eye, a right angle or a little blunt at apex; proboscis short, palpi slender with pale hairs; head bristles weakly developed with short *ovt* and *ivt*, much shorter and proclinate *pvt* and *oc*, short hair-like *orb* and hairy *if* in one row along lateral margin of frontal triangle.

Thorax. Mesonotum black or with rusty yellow ground colour, often with 3 black longitudinal bands, partly or wholly grey tomentose with slender and very rarely with scale-like white hairs, usually shallowly depressed along dorsocentral lines; scutellum yellow, brown or darkened, convex, usually with rounded and rarely with subtriangular laterodistal margin, tomentose and pubescent like scutum. Pleura black or brown, grey tomentose with black wholly shining or partly tomentose maculae; *anepst* in some species with and in most species without white hairs; *kepst* in all species with long white hairs; thoracic bristles yellowish white with 1+2 *npl*, *pa 1*, *pa 2*, 1 *dc* and no distinct *h 1* bristles; *as* rarely as long as scutellum, often short and hair-like; *ss 1-2*, much shorter than *as*.

Wing. Often partly infuscated; terminal sector of M1+2 convex above and that of R4+5 rarely so; anal area rather well developed and at times with a distinct anal fold below basal part of discal cell. Haltere white, rarely with brown to deeply brown tinge.

Legs: Simple, largely darkened, silvery grey tomentose with white hairs and narrow tibial organ.

Abdomen. Ovoid, black to brown tomentose, with pale hairs. Female short, rather stumpy. Male genitalia of *Eutropha*-type; middle lobe of surstylus pointed and hook-like; mesolobus short and hairy; pregonite with or without knob at anterior end.

**D i s t r i b u t i o n.** Oriental, Palaearctic and Afrotropical Regions.

**R e m a r k s.** ANDERSSON (1977) when he erected the *Eutropha* genus group placed four genera, *Eutropha* LOEW, *Bathyparia* LAMB, *Cerais* VAN DER WULP and *Pemphigonotus* LAMB under the group which were later placed along with many other genera under the tribe Mindini by NARTSHUK (1983, 1987). Of these related genera only *Bathyparia* and *Pemphigonotus* have silvery white hairs on *anepst*, in the former stout scale-like and in the latter normal slender hairs, while *Eutropha* and *Cerais* are without hairs on *anepst*. However, we have a new species, described below from India, belonging to *Cerais* especially because of the nature of its *ant 3* and frons as in the type species *magnicornis* and distinct parafacialia in profile as in *tadzhikorum* (NARTSHUK) but has white hairs on *anepst* typical of the genus *Bathyparia*.

In all the known species of *Cerais* *ant 3* is at least 1.5x as long as wide. In the type species *magnicornis* VAN DER WULP of *Cerais* and in the new species it is 3x as long as wide and is narrowing distally, more so in the former. In all the species of *Cerais* *ant 3* is concave above. In *praeclara* LAMB, the only species of *Bathyparia* known, *ant 3* is 1.5x as long as wide, slightly concave above and a little angulate at dorsodistal margin. The major differences between species of *Bathyparia* and *Cerais* are that in the former hairs on scutum and some other parts of the body are thickened and scale-like, frontal triangle is smooth, shiny and narrower, *anepst* is with white hairs and parafacialia is visible in profile. In the new species hairs on scutum and some other parts of the body are not scale-like, but parafacialia is distinctly visible in profile, *anepst* is with white hairs, frontal triangle though broad at vertex is midlongitudinally not tomentose but smooth and shiny. Besides, the male genitalia of species of *Cerais* and *Bathyparia* are of the *Eutropha*-type, not exhibiting differences of generic significance. As for the scale-like hairs on thorax found in *Bathyparia*, there are a number of species of *Siphunculina* RONDANI which possess normal slender hairs and some typical species like *S. intonsa* LAMB and *S. ulceria* CHERIAN which possess short, stout and scale-like hairs. Hence it is not a character of generic significance. Therefore *Bathyparia* is considered a junior synonym of *Cerais praeclara*, LAMB, the only species of *Bathyparia* so far known is transferred to *Cerais*.

In the Encyclopedia of Life (2013) only three species, *rara* (BECKER), *tadzhikorum* (NARTSHUK) and *trifasciata* (DE MEIJERE) (DE MEIJERE 1910) are placed under *Cerais* and the type species *Cerais magnicornis* has been transferred to *Aragara* WALKER, thereby placing 7 species under *Aragara*. With its distally greatly narrowed *ant 3* which is 3x as long as wide and is greatly concave above and normally developed fore femur *magnicornis* is entirely different from other known species of *Aragara*. In all the species of *Aragara* known so far, including *femorata* CHERIAN, *mizoramensis* CHERIAN and *trilineata* CHERIAN (1984) which are Indian endemics, *ant 3* is wider than long, is normally developed and fore femur is greatly swollen with spines along anteroventral and posteroventral surfaces, often forming a crib into which fore tibia fits in. Hence *magnicornis*, the type species of *Cerais* is transferred back to the genus and six species including two new species described below are placed under *Cerais*. Thus there are only six species known under *Aragara*.

A key to all the six species of *Cerais* known from the world is also given. This is the first record of *Cerais* from India.

**Key to species of *Cerais* VAN DER WULP of the world**

1. *ant* 3 narrowing distally, its length around 3x or more its maximum width . . . . 2
  - *ant* 3 not narrowing distally, its length not more than 2x its maximum width . . . . 3
2. *ant* 3 shoe-shaped and moderately narrowing distally, its width in the middle of distal half 0.5x its maximum width; arista more than half as long as *ant* 3; *anepst* with white hairs . . . . . *C. ponti*, sp.n.
  - *ant* 3 not shoe-shaped but greatly narrowing distally, its width in the middle of distal half one-third its maximum width; arista less than half as long as *ant* 3; *anepst* without hairs. . . . . *C. magnicornis* VAN DER WULP
3. Frontal triangle small, its width at vertex only a trifle more than half the width of frons at vertex, smooth and shiny; *ant* 3 with a little pointed dorsodistal corner; *anepst* with long white hairs . . . . . *C. praeclara* (LAMB)
  - Frontal triangle not small, its width at vertex three-fourths or more the width of frons at vertex, tomentose; *ant* 3 with broad distal margin; *anepst* without hairs . . . . . 4
4. *ant* 3 2x as long as wide with nearly straight lateral margins; R1 reaching middle of wing . . . . . *C. rara* (BECKER)
  - *ant* 3 only 1.5x as long as wide with slightly or distinctly medially concave upper and medially convex lower margins; R1 not reaching middle of wing. . . . 5
5. In profile frons along its entire length projecting above level of eye, more so anteriorly; arista as long as antenna; second sector of costa 1.5x as long as third sector . . . . . *C. tadzhicorum* (NARTSHUK)
  - In profile frons not projecting above level of eye medially; arista much shorter than antenna; second sector of costa less than 1.5x as long as third sector . . . . 6
6. Parafacialia distinctly visible in profile; facial carina developed, running as a low median sublinear ridge reaching a little behind epistomal margin and visible in profile; antenna 1.5x as long as arista; r-m cross vein joining distad of middle of discal cell, opposite 0.69 of its length; proportions of costal sectors 2-3 in the ratio 9:7; haltere almost dark brown. . . . . *C. travancorensis* sp.n.
  - Parafacialia not visible in profile; facial carina not developed; antenna only 1.2x as long as arista; r-m cross vein joining distad of middle of discal cell opposite 0.6 of its length; proportions of costal sectors 2-3 in the ratio 15:13; haltere white . . . . . *C. trifaciata* ANDERSSON

***Cerais ponti* CHERIAN, sp.n.**

(Figs 1-5)

**D i a g n o s i s.** Moderately large species which possesses long, shoe-shaped *ant* 3, midlongitudinally nontomentose and shiny frontal triangle, white and slender hairs on *anepst* and distally cruciate surstyli.

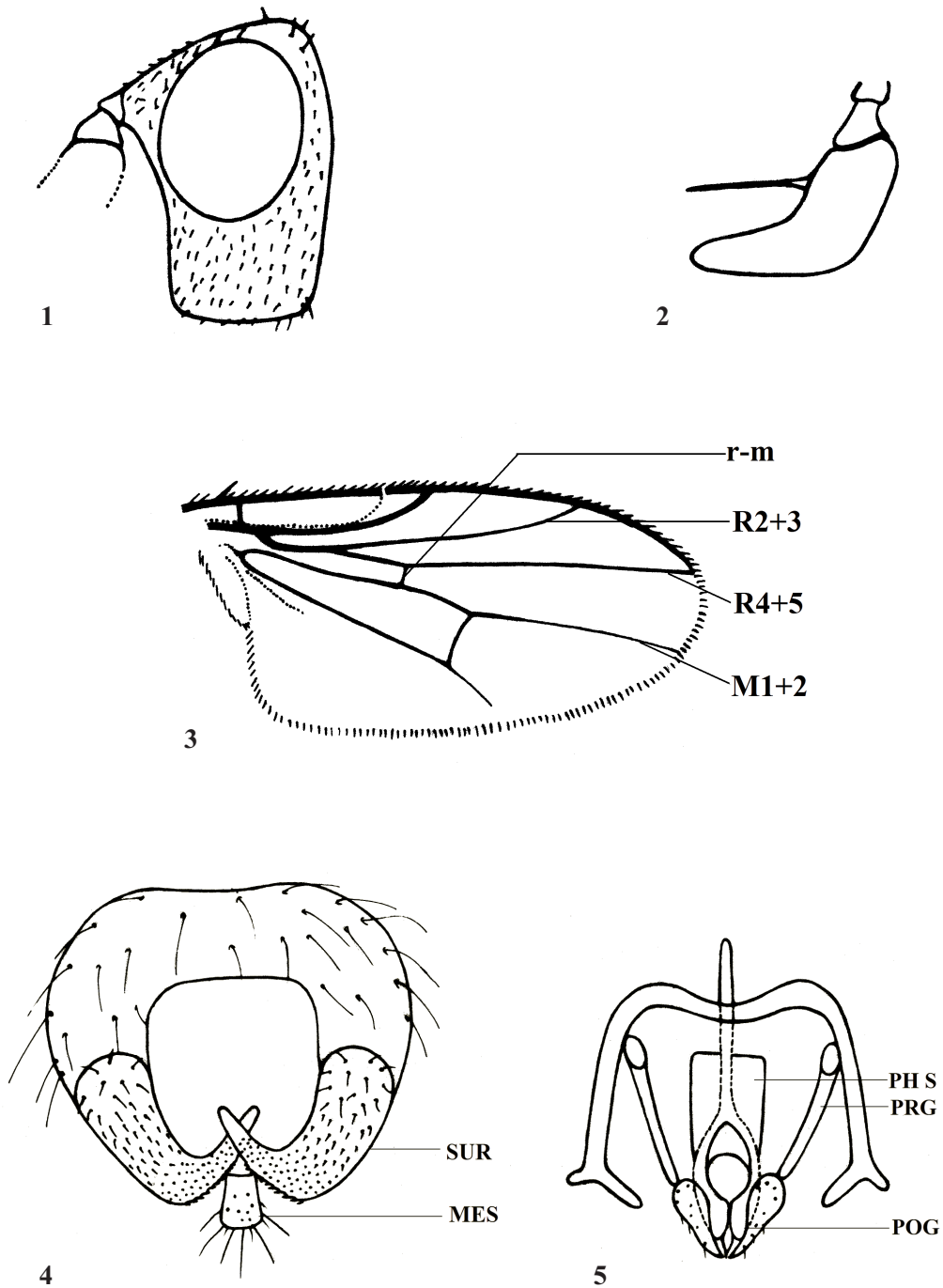
**E t y m o l o g y.** This species is named in honour of the collector of the specimen.

**M a t e r i a l e x a m i n e d.** Holotype: male, India: Hyderabad, 4.XI.1971, coll. A.C. PONT.

**Description.** Male: head (Fig. 1) wider than thorax, length height and width ratio 21:22:28. Frons nearly parallel-sided but widening at vertex, width at vertex more than half that of head and 1.2x as long as wide, slightly projecting beyond anterior margin of eye, deeply brownish, densely silvery white tomentose with shiny white *fr*; frontal triangle at vertex nearly as wide as frons, subshiny black, densely grey tomentose but for nearly spindle-shaped median, shiny black longitudinal streak running from anterior ocellus to nearly anterior margin of frons. Parafacialia distinct in profile, narrower than in *praeclara* (LAMB) but more developed than in *trifaciata* (DE MEIJERE) and *rara* (BECKER). Face long, narrow, receding and silvery white tomentose; facial carina not developed. Antennae (Fig. 2) grey tomentose; two basal segments blackish brown; *ant 2* longer than wide; *ant 3* shoe-shaped, length 3x its maximum width and 0.9x length of head, brownish behind and dark brown dorsally and distally; arista short, two-thirds as long as *ant 3*, attached dorsally at one-third length of *ant 3* from base; basal segment of arista thickened, two-ninths of its length basally deeply brown, the rest white, without pubescence. Gena very wide, width 1.5x that of maximum width of *ant 3* and 0.43x height of head, densely silvery white tomentose and with shiny white hairs especially in lower half; post gena tomentose and pubescent like gena. Eye small with oblique long axis and fine, scattered pubescence. Occiput, palpi and proboscis with slender white hairs, palpi yellow and proboscis brownish black. All head bristles very slender concolourous with and hardly distinguishable from *fr*; *ovt* one-fifth as long as width of eye; rest of head bristles short, slender, almost indistinct; *if* very small, in a row on margin of frontal triangle.

Thorax: Scutum convex, nearly as long as wide, black, densely silvery grey tomentose which is less dense (in some areas absent) along three, nearly equally broad, anteriorly and posteriorly abbreviated longitudinal bands which are shiny in some areas, wholly with fairly dense slender white hairs; scutellum brown, highly convex, width at base 1.5x its length, tomentose and pubescent like scutum, appearing entirely silvery grey dorsally. Pleura also silvery grey tomentose, deeply brownish except for black posterior part of *anepst*, much of *kepst*, upper part of *anepm* and part of *meron*, the black areas of pleura nontomentose or only partly tomentose giving such areas a shiny appearance; slender white hairs present on *anepst* as in *Bathyparia praeclara* LAMB and unlike in other species of *Cerais*; *kepst* with white hairs which are longer in posterior half. Thoracic bristles slender, hardly distinguishable from the white hairs; *h 1* indistinguishable; *npl 1+2*, subequal slightly longer than *ovt*; *pa 1* and *1 dc* equal to *npl*; *as* approximated at base, 0.4x as long as scutellum; *ss 1* two-thirds as long as *as*.

Wing (Fig. 3) 2.5x as long as wide, infuscated except for some what hyaline distal one-third of its length and area along the distal and lower margins; all the veins strongly developed, dark brown; costal sectors 2 to 3 and distance between ending of R4+5 and M1+2 in the ratio 20:17:12; r-m cross-vein joining discal cell distad of its middle, opposite 0.68 of its length; terminal sectors of R4+5 and M1+2 gradually diverging distally, the latter convex above along most of its length and evanescent except for one-fourth its length basally; there is a faint anal fold in the area of anal vein; anal field well developed. Knob of haltere and distal part of stalk yellowish white, basal part of stalk deeply brown (though the knob appeared yellowish white in 1975, yet in 2013 it is having dark tinge).



**Figs 1-5.** *Ceraiis ponti* sp.n. 1. Head profile; 2. Antenna; 3. Wing; 4. Epandrium; 5. Hypandrium and phallic complex.



Legs: all legs silvery grey tomentose with white hairs; fore coxa and trochanter brown; rest of foreleg and whole of mid and hind legs brownish black but for yellowish brown distal ends of all femora and basal ends of all tibiae; hairs on anteroventral and posteroventral margins of femora arranged in a row; tibial organ long and narrow.

Abdomen: fairly broad, ovoid, blackish brown, weakly silvery grey tomentose and with white hairs. Male genitalia (Figs 4-5) of *Eutropha*-type with pointed, hook-like middle lobe of surstylus (SUR); cerci fused to form hairy mesolobus (MES); pregonite straight, narrow with a knob at anterior end; postgonites short, curved.

Length: male 2.9 mm, wing 3 mm.

**R e m a r k s.** This species shows affinities to *magnicornis* in possessing very long *ant 3* which is 3x as long as wide and such other characters but differs from the latter in having distinct hairs on *anepst*, in the nature of *ant 3* which is shoe-shaped with its maximum width not more than 2x its width in the middle of distal half and its arista being about two thirds as long as *ant 3*. But in *magnicornis* *anepst* is without hairs, *ant 3* is not shoe-shaped, is greatly narrowed in distal half, its width in the middle of distal half only about one-third its maximum width and arista being less than half as long as *ant 3*. Though both *ponti* and *praeclara* (LAMB) possess hairs on *anepst* and yet unlike in the former, the latter has narrower, smooth and shining frontal triangle, scale like hairs of thorax and no distinct longitudinal bands on scutum. Thus *ponti* possesses characters intermediate between those of genera *Cerais* and *Bathyparia*.

***Cerais travancorensis* CHERIAN & GEORGE, sp. n.**

(Pl. 1-3)

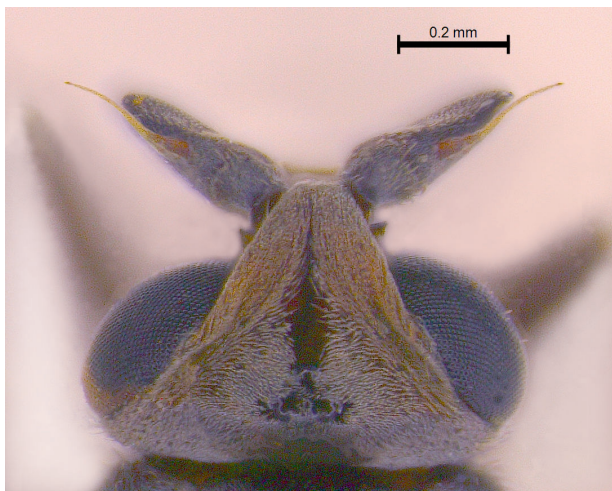
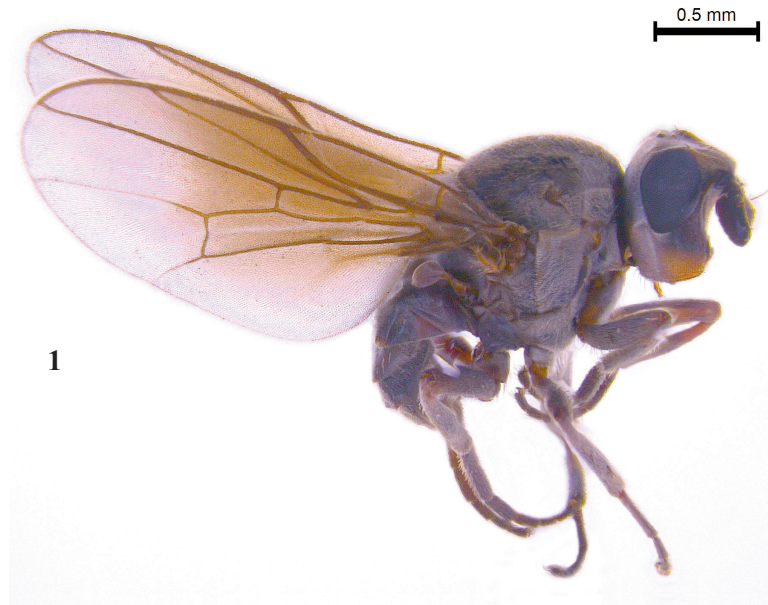
**D i a g n o s i s.** A species close to *trifasciata* ANDERSSON but differing in possessing facial carina, distinctly visible parafacialia in profile, longer arista and almost dark brown haltere.

**E t y m o l o g y.** The species is named after Travancore, the name of the southern part of the Indian state Kerala from where the holotype was collected.

**M a t e r i a l e x a m i n e d.** Holotype female, India: Kerala, Trivandrum Dist., Kariavattom, alt. 25 m, 29.IX.2007, coll. A.K. SHINIMOL.

**D e s c r i p t i o n.** Female (Pl. 1): head (Pl. 2) as wide as thorax, length, height and width ratio 13:19:20. Frons conspicuously widening at vertex; width at vertex a little more than its length, projecting sublinearly above upper margin of eye along its entire length and greatly so above and beyond anterior margin of eye, dull black with light brown tinge especially in distal half, densely and conspicuously grayish white tomentose; frontal triangle almost as wide as frons at vertex, dull, concolourous with tomentose-like frons except for smooth, nontomentose somewhat spindle-shaped shiny black midlongitudinal streak which reaches sublinearly a little behind anterior margin of frons. Face long, concave medially, dull brownish and grey tomentose; facial carina develops as a low ridge which reaches a little beyond middle of face; epistomal margin v-shaped and greatly projecting above level of face. Basal antennal segments dull tomentose; entirely black; *ant 1* with a spinous protuberance near its base; *ant 2* longer than wide; *ant 3* 1.6x as long as wide with medially concave upper and convex lower margins, black except for light brownish





**Plates 1-3.** *Cerais travancorensis* sp.n. Pl.1. Female fly; Pl.2. Head, dorsal view; Pl.3. Head & thorax, dorsal view.

yellow tinge at base, distally not widening as in *tadzhicorum* or *trifasciata*; 1.7x as long as arista, basally thickened and brownish, flagellum whitish with almost indistinct pubescence; parafacialia sublinear, visible in profile but narrower than in *tadzhicorum*. Gena about 1.2x as wide as *ant* 3, densely silvery white tomentose, dull brownish black with brown yellow tinge submedially and with white hairs, vibrissal corner almost a rectangle, parafacialia without yellow tinge, with a few hairs. Eye longer than wide with vertical long axis and very scattered fine pubescence. Palpi long and slender, yellowish brown with a few hairs, proboscis short; head bristles as in *trifasciata*, short, white, slender and hair-like.

Thorax (Pl. 3) Scutum convex, as long as wide, black, densely silvery grey tomentose which is less dense (in some areas absent) along three nearly equally broad anteriorly and posteriorly abbreviated longitudinal bands which are less shiny in some areas than in *ponti*, wholly with fairly dense slender white hairs. Scutellum 1.4x as wide as long, broadly subtriangular at apex with convex disc which is tomentose and pubescent like but less darker than scutum. Pleura concolourous with and tomentose like scutum except for a shiny non-tomentose longitudinal macula along anterior border of *anepst*; *kepst* with and *anepst* without slender white hairs. Thoracic bristles white, slender, hair-like, similar to those in *trifasciata*; *as* 0.4x as long as scutellum, somewhat approximated at base; *ss* 1 two-thirds as long as *as* and *ss* 2 shorter; lateral scutellar more like marginal hairs on scutum.

Wing (Pl. 1): 2.4x as long as wide, infuscated but becomes light brown distally and along lower margin, with thickened dark brown veins. Proportions of costal sectors 2-3 and distance between ending of R4+5 and M1+2 in the ratio 18:14:9, r-m cross-vein joining discal cell far distad of its middle, opposite 0.69 of its length, terminal sectors of R4+5 and M1+2 gradually diverging distally, the latter thickened and convex above basally and becomes evanescent along three-fourths its length distally; anal field well developed; an anal fold is developed as in *ponti*. Haltere yellowish brown with infuscated knob.

Legs: predominantly brownish black with yellowish brown tinge at the joints of femora and tibiae; tibial organ long and narrow.

Abdomen: medially almost as wide as thorax, dull black, grey tomentose and with short white hairs. Female cerci short, rather stumpy with a few slender white hairs.

Length: female 2.2 mm; wing 2.56 mm.

**R e m a r k s.** *C. travancorensis* keys near *C. trifasciata* (DE MEIJERE) from Srilanka. However in the former the parafacialia is distinctly visible in profile, facial carina is developed, frons projects sublinearly above upper margin of eye along its whole length in profile and widens anteriorly, antenna is 1.7x as long as arista, r-m cross-vein joins far distad of middle of discal cell opposite 0.69 of its length, proportions of costal sectors 2-4 are in the ratio 18:14:9 and knob of haltere is infuscated. But in *trifasciata* parafacialia is not visible in profile, facial carina is not well developed, frons is below the level of upper margin of eye in profile, antenna is only 1.2x as long as arista, r-m cross-vein joins discal cell opposite 0.6 of its length from base, proportions of costal sectors 2-4 are in the ratio 15:13:8 and haltere is white.

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