



## Two new Indian gall midges of the genus *Contarinia* Rondani (Cecidomyiidae: Diptera) reared from *Amaranthaceae* & *Poaceae*

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Family Cecidomyiidae (= Itonididae) is one of the largest but youngest family of nematoceros Diptera having worldwide distribution. Insects commonly known as gall midges are included in this family. Many of them produce characteristics galls, i.e., deformities on various plant parts on both dicotyledon and monocotyledon plants caused by gall midges of the subfamily Cecidomyiinae; however members of the subfamilies Lestremiinae and Porricondyliinae do not produce such galls. Gall midges have phytophagous, saprophagous, xylophagous and predaceous feeding habits. A few of them are serious pests of economically important crops such as jowar, rice, bajra, wheat; fruit trees such as mango, citrus, papaya; oilseed crop such as linseed, safflower and several grass species. A few gall midge species have a role in the biological control of a few serious insect pests.

A total of 394 species belonging to 125 genera under three subfamilies are so far enlisted in India (Sharma 2009). The collection of gall midge fauna made during

2003-2008 in Nanded District of Maharashtra State revealed two new species of genus *Contarinia* Rondani, namely, *Contarinia asperae* sp. nov. bred from leaf galls of *Achyranthes aspera* L. (*Amaranthaceae*) and *Contarinia dichanthiumae* sp. nov. reared from ear heads of *Dichanthium aristatum* Hub. (*Poaceae*). Presently, 13 species under the genus *Contarinia* are reported from India. With the addition of these two new species the number of species is now 15. All type slides are presently retained for the time being with the P.G. Department of Zoology, Science College, Nanded.

### *Contarinia asperae* sp. nov.

(Figs. 1-16)

#### Material examined

**Holotype:** Male, 17.xi.2006, (slide no Cont.1) labelled as, "reared from leaf galls of *Achyranthes aspera* L. (*Amaranthaceae*), Bhokar forest, Nanded District, India, dissected and mounted on slide, coll. M.S. Siddiqui.

**Allotype:** One female (slide no Cont.2), dissected and mounted on slide, data as of Holotype.

**Paratype:** One male (slide no Cont.3), dissected and mounted on slide, coll, data as of Holotype.

**Study area:** Sitakhandi and Bhokar forest, Nanded District, Maharashtra, India.

#### Etymology

The specific epithet *asperae* is associated with the host plant i.e. *Achyranthes aspera* L.

#### Diagnostic features

##### Male

**Body:** 1.30mm long.

**Head:** eyes confluent above. Trophi normal. Palpus (Fig. 1) quadriarticulate, short, first segment (5) not clearly observed in the preparation; second segment (9:6) subcylindrical, longer and thicker than the first; third segment (9:5) cylindrical; fourth segment (11:4) longest of all, cylindrical.

**Antenna:** 0.75mm long, shorter than the body, with 2+12 segments, flagellate segments binodose, basal enlargements subglobose, with one whorl of long regular circumfila and one whorl of long bristles, apical enlargements subglobose, with one whorl of long regular circumfila and one whorl of long bristles; scape (Fig. 6a) (10:12) cup-shaped; pedicel (Fig. 6b) (10:10) globose, third segment (Fig. 4a) (29) confluent and longer than the fourth, with a very short basal prolongation (3:5), basal enlargement (9:8) 0.31 the length of the segment;

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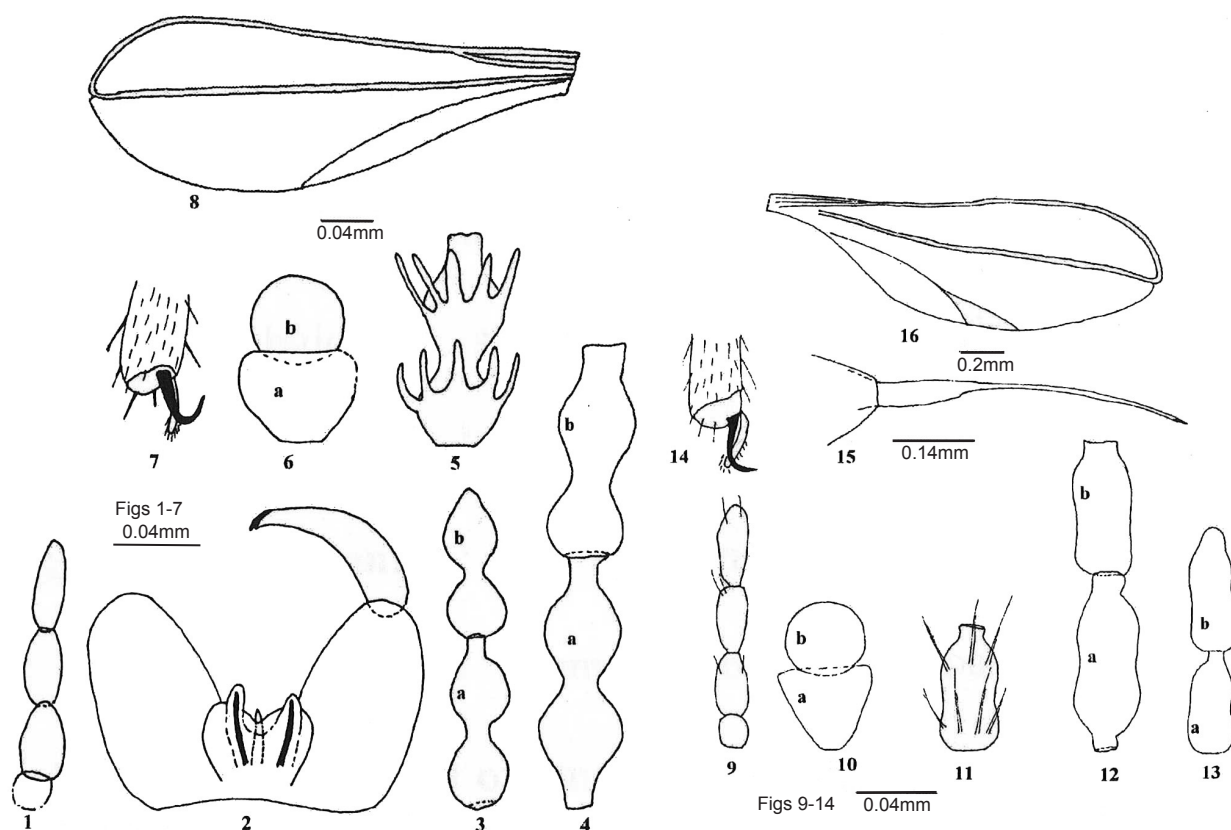
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**Figures 1-16. *Contarinia asperae* sp. nov. (1-8 male; 9-16 female)**

1 - Palpus; 2 - Genitalia; 3(a,b) - Penultimate and terminal antennal segments; 4(a,b) - Third and fourth antennal segments; 5 - Fifth antennal segment; 6(a,b) - Scape and pedicel; 7 - Claw; 8 - Wing; 9 - Palpus; 10(a,b) - Scape and pedicel; 11 - Fifth antennal segment; 12(a,b) - Third and fourth antennal segments; 13(a,b) - Penultimate and terminal antennal segments; 14 - Claw; 15 - Ovipositor; 16 - Wing.

basal stem (3:4) nearly one-third the length of basal enlargement; apical enlargement (10:9) nearly as long as the basal enlargement; apical stem (4:3) less than half the apical enlargement; fourth segment (Fig. 4b) (23) the basal enlargement (8:10) 0.34x the length of the segment & thicker than long, basal stem (3:4) one-third the length of basal enlargement and thicker than long, apical enlargement (10:10) 0.8x the length of the segment and as long as thick, apical stem (3:4) one-third the length of apical enlargement and as long as thick; fifth segment (Fig. 5) (24) shorter than the third, the basal enlargement (8:10) one-third the length of segment & thicker than long, basal stem (3:4) and nearly the length of basal enlargement and thicker than long, apical enlargement (11:10) longer than the basal and nearly as long as thick, apical stem (3:4) less than one-third the length of apical enlargement and thicker than long; sixth to twelfth segments nearly similar to the fifth; penultimate segment (Fig. 3a) (22) shorter than the fifth; terminal segment (Fig. 3b) (16) with a basal enlargement (7:6) 0.43 the length of segment, basal stem (3:2) nearly half the length of basal enlargement, apical enlargement (4:3) half the length of basal enlargement & thicker than long, ending with nipple like prolongation.

**Thorax:** pale brown. Wing (Fig. 8) (97:33) hyaline, 2.93 x as long as broad, vein Rs short, Vein  $R_5$  reaching

wing margin at its apex and interrupting costa at its union; vein Cu simple.

**Legs:** brown, densely hairy, metatarsus (19) little longer than terminal tarsal segment (17), second tarsal segment (66) longest of all, fourth (17) shorter than the third. Claw (Fig. 7) (11) simple on all legs, sickle shaped, empodium (8) 0.72 the length of claw. Genitalia (Fig. 2) light brown, basal clasp segment (28:15) oval, without lobe, terminal clasp segment (18:5) broad basally and narrow beyond middle, ending with a tooth apically; dorsal plate (13:11) deeply bilobed, lobes oval, subdorsal plate (10:13) shallowly bilobed, shorter and broader than the dorsal plate, lobes rounded apically, with a pair of unsclerotised harpes, the later shorter than the dorsal plate; aedeagus (10) short, tip pointed, shorter than both the plates.

#### Female

**Body:** 1.60mm long.

**Head:** Eyes confluent above. Trophi normal. Palpus (Fig. 9) quadriarticulate, moderately hairy, and sparsely setose; first segment (5:4) subglobose, second segment (9:6) subcylindrical, broad basally; third segment (9:5) cylindrical, shorter and thinner than the second, fourth segment (11:4) longest of all, cylindrical.

**Antenna:** 0.35mm long, shorter than the body, with 2+12 segments, flagellate segments cylindrical, constricted medially, apical stems short, enlargements with low circumfila, and with two whorls of long bristles; scape (Fig. 10a) (10:11) cup-shaped; pedicel (Fig. 10b) (8:9) sub-globose, shorter than the scape; third segment (Fig. 12a) (20) with a short basal prolongation (2:2) enlargement (15:7) 0.75 the length of the segment and 2.14x as long as thick, apical stem (3:3) 0.15 the length of the enlargement and as long as thick; fourth segment (Fig. 12 b) (16) shorter than the third, enlargement (14:7) 0.87 the length of the segment, apical stem (2:3) 0.14 the length of the enlargement and thicker than long; fifth segment (Fig. 11) (15) enlargement (13:6) 0.86 the length of the segment, apical stem (2:3) 0.15 the length of the enlargement and thicker than long; sixth to twelfth segments progressively shortened distally; penultimate segment (Fig. 13a) (12) shortest of all; terminal segment (Fig. 13b) (15) enlargement (15:6) 2.5x as long as thick, ending in to a rounded tip.

**Thorax:** pale brown. Wing (Fig. 16) (115:38) hyaline, 3.02 x as long as broad, venation as in male.

**Legs:** long, densely hairy, metatarsus (15) shorter than the terminal tarsal segment (20), second tarsal segment (66) longest of all, fourth segment (17) shorter than the third. Claw (Fig. 14) (9) simple on all legs, bent at right angle, empodium (7) 0.77 the length of the claw. Ovipositor (Fig. 15) aciculate, exerted, needle - like, shorter than body,

### Remarks

*Contarinia asperae* sp. nov. can be separated easily from *Contarinia* (= *cincticornia*) *bivalviae* (Rao, 1950) in the presence of harps, aciculate ovipositor (not ovipositor with 2 small lobes) and empodium being shorter than the claw (not, empodium as long as claw). This new species also differs from other closely placed species i.e. *Contarinia ramchandri* (Mani, 1953) in possessing bilobed dorsal plate (not, dorsal plate obtusely triangular)

### *Contarinia dichanthiumae*, sp. nov. (Figs.17-32)

### Material examined

**Holotype:** Male, 12.xii.2005, (Slide no. Cont. 4), labelled as, "reared from ear heads of *Dichanthium aristatum* Hub. (Family Poaceae), Vishnupuri, Nanded District, India, coll. M.S. Siddiqui.

**Allotype:** One female (Slide no. Cont.5), data as of Holotype.

**Paratype:** Two males (Slide no. Cont.6-7), and two females (Slide no. Cont.8-9), data as of Holotype.

**Study area:** Vishnupuri, Nanded District, Maharashtra, India.

### Etymology

The specific epithet *dichanthiumae* is associated with the host grass species i.e. *Dichanthium aristatum* Hub. (Family: Poaceae).

### Diagnostic features

#### Male

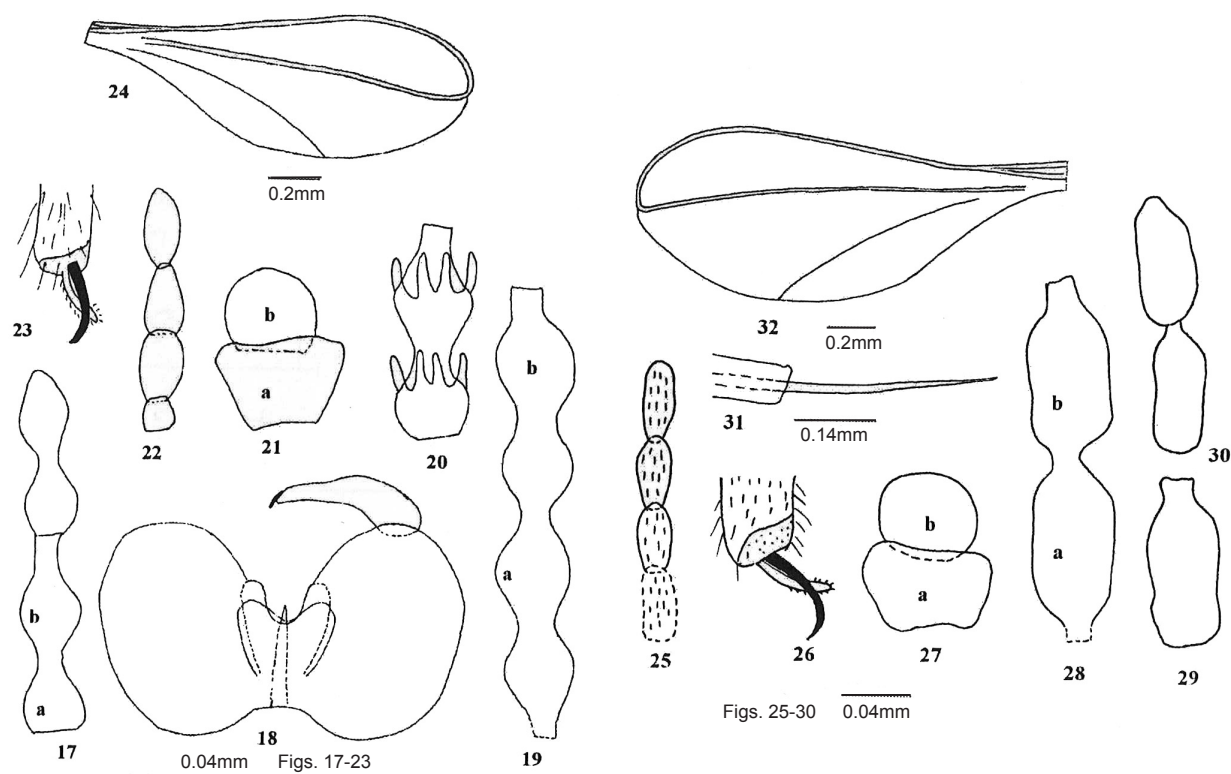
**Body:** 1.33mm long.

**Head:** eyes confluent above. Trophi normal. Palpus (Fig. 22) quadriarticulate, short, first segment (5:4) subglobose, second segment (9:6) subcylindrical, third segment (8:5) subcylindrical, fourth segment (8:4) subcylindrical, 2.00x as long as thick.

**Antenna:** 1.00mm long, shorter than the body, with 2+12 segments, flagellate segments binodose, basal enlargements subglobose, with one whorl of long, regular circumfila and one whorl of long bristles, apical enlargements subglobose, with one whorl of long, regular circumfila and one whorl of long bristles; scape (Fig. 21a) (9:14) cup-shaped; pedicel (Fig. 21b) (10:11) subglobose; third segment (Fig. 19a) (30) confluent with and longer than the fourth, with a very short basal prolongation (3:4), basal enlargement (9:8) 1.12x as long as thick, basal stem (4:5) nearly half the basal enlargement and thicker than long, apical enlargement (10:10) slightly longer than the basal, apical stem (4:5) less than half the length of apical enlargement, thicker than long, fourth segment (Fig. 19b) (27) shorter than thick, with basal enlargement (8:9) 0.88x as long as thick, basal stem (3:4) less than half the basal enlargement and thicker than long, apical enlargement (11:10) longer than the basal, apical stem (4:4) less than half the length of apical enlargement and as long as thick; fifth segment (Fig. 20) (28) with a basal enlargement (7:9) one fourth the length of segment, thicker than long, basal stem (5:5) nearly two-third the length of basal enlargement, apical enlargement (11:10) longer than the basal, 1.57x the length of the basal enlargement, apical stem (5:4) nearly half the length of apical enlargement; sixth to twelfth segments progressively shortened distally; penultimate segment (Fig. 17a) (22) with the basal enlargement (7:7) 0.31 the length of the segment, basal stem (3:3) nearly half the length of basal enlargement, apical enlargement (8:7) longer than the basal, 1.14x as long as thick, apical stem (5:3) more than half the length of apical enlargement and 1.66x as long as thick; terminal segment (Fig. 17b) (20) shortest of all, with basal enlargement (6:6) 0.3 the length of the segment, basal stem (3:2) 0.5 the length of basal enlargement, apical enlargement (8:6) longer than the basal, ending with a rounded tip.

**Thorax:** Mesonotum pale brown. Wing (Fig. 24) (95:35) hyaline, 2.7x as long as broad, vein Rs short, Vein R<sub>5</sub> reaching wing margin at the wing apex and interrupting costa at its union; vein Cu simple.

**Legs:** long, densely hairy, metatarsus (21) longer than terminal tarsal segment (20), second tarsal segment (72) longest of all. Claw (Fig. 23) (10) simple on all legs,



**Figures 17-32. *Contarinia dichanthiumae* sp. nov.** (17-24 male; 25-32 female)

17(a,b) - Penultimate and terminal antennal segments; 18 - Genitalia 19(a,b) - Third and fourth antennal segments; 20 - Fifth antennal segment; 21(a,b) - Scape and pedicel; 22 - Palpus; 23 - Claw; 24 - Wing; 25 - Palpus; 26 - Claw; 27(a,b) - Scape and pedicel; 28(a,b) - Third and fourth antennal segments; 29 - Fifth antennal segment; 30(a,b) - Penultimate and terminal antennal segments; 31 - Ovipositor 32 -Wing.

sickle shaped, empodium (8) 0.8 the length of the claw. Genitalia (Fig. 18) basal clasp segment (30:21) oval, 1.42x as long as broad; terminal clasp segment (22:6), 3.7x as long as broad, ending with a pointed tooth apically; dorsal plate (15:13) deeply bilobed, lobes round, subdorsal plate (12:14) bilobed, shorter and wider than the dorsal plate, lobes broadly rounded apically, aedeagus (12) as long as the subdorsal plate but shorter than the dorsal plate.

#### Female

**Body:** 2.50mm long.

**Head:** Eyes confluent above. Trophy normal. Palpus (Fig. 25) quadriarticulate, moderately hairy, first segment (11:5) subcylindrical, second segment (10:5) subcylindrical, third segment (9:5) subcylindrical, fourth segment (11:4) cylindrical, as long as first.

**Antenna:** 0.90mm long, shorter than the body, with 2+12 segments, flagellate segments cylindrical, enlargements with low circumfila, and with two whorls of long bristles; scape (Fig. 27a) (10:18) cup-shaped; pedicel (Fig. 27b) (11:12) subglobose; third segment (Fig. 28a) (22) confluent with but nearly as long as the fourth, with a short basal prolongation (3:2), enlargement (16:9) 1.8x as long as thick, apical stem (3:3) 0.18 the length of the enlargement, fourth segment (Fig. 28b) (21) with enlargement (18:9) 0.85 the length of the segment,

apical stem (3:3) 0.16 the length of the enlargement, fifth segment (Fig. 29) (22) with enlargement (18:8) 0.81 the length of the segment, and 2.25x as long as thick, apical stem (4:4) 0.2 the length of the enlargement; Sixth to twelfth segments progressively shortened distally; penultimate segment (Fig. 30a) (15) with enlargement (13:6) 0.86 the length of the segment, apical stem (2:2) 0.15 the length of the enlargement, Terminal segment (Fig. 30b) (16) with enlargement (14:6) 0.86 the length of the segment, tip rounded apically.

**Thorax:** Mesonotum pale brown. Wing (Fig. 32) (94:39) hyaline, 2.41x as long as broad; venation as in male.

**Legs:** brown, long, densely hairy, metatarsus (20) as long as the terminal tarsal segment, second tarsal segment (80), third segment (36) longer than the fourth (22); Claw (Fig. 26) (13) simple on all legs, sickle shaped; empodium (9) 0.69 the length of claw. Ovipositor: (Fig. 31) aciculate, exerted, needle like, shorter than the body.

#### Remarks

*Contarinia dichanthiumae* sp. nov. is morphologically closer to *C. prosopidis* (Mani, 1938), but can be easily distinguished in possessing (i) empodium shorter than claw (not, empodium longer than claw), (ii) enlargement of fifth antennal segment of female 2.25x as long as thick

(not 1.5x as long as thick). This new species can also be easily separated from other closely related species i.e. *C. caudata* (Felt, 1920) in possessing empodium shorter than claw (not, empodium as long as claw) and *C. orientalis* (Rao & Sharma, 1977) infesting ear heads of *Dichanthium pertusum* (L.) W.D. Clayton, in having quadriarticulate palpi (not, triarticulate).

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