

Morphotaxonomic characterization of *Haematopota montana* and *Chrysops dispar* (Diptera: Tabanidae) from Warangal District, Telangana, India

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Abstract

A total of 8,488 tabanid fly specimens were collected from August 2023 to July 2025 across the Warangal district of Telangana, India, using trapping and hand-picking methods. The collected specimens were subjected to detailed morphological examination and identified based on key diagnostic characters, including body size, head morphology, thorax, wings, legs, antennae, and abdominal features. These flies identified on the basis of morphological identification key for the family *Tabanidae*. Morphological characterization revealed the present out of seven Tabanids here listed and detailed each one species of *Haematopota montana* and *Chrysops dispar*. this study helps in accurate identification and taxonomic characterization of Tabanid flies occurring in the Warangal district and surrounding regions. It enables rapid discrimination of closely related species based on readily observable morphological traits, thereby improving the accuracy of species identification in both field and laboratory investigations.

Keywords: Tabanidae, *Haematopota montana*, *Chrysops dispar*, morphotaxonomy, Warangal District

Introduction

Family *Tabanidae* contains approximately 4,455 species and subspecies in 144 genera worldwide (Baldacchino *et al.*, 2014^[5] a; Morita *et al.*, 2016 a). In India, 247 species, one sub species in 14 genera, six tribes and three sub families have been recorded (Maity *et al.*, 2016 b) ^[32]. each one species of *Haematopota* and *Chrysops* species of *Tabanidae* have been recorded from Warangal district of Telangana. They belong to three genera viz., *Haematopota*, *Chrysops*, in two subfamilies viz., Tabaninae, Chrysopsinae (Kapoor *et al.*, 1990; Veer, 2004; Vasudeva, 2007a) ^[25, 69, 70]. This *Haematopota*, *Chrysops* flies shows different characters on the wing pattern and antenna and markings on the abdomen. Adults are diurnal, often most active in sunny weather and generally rest on trees. Males feed on nectar from flowers while females are hematophagous on animals and occasionally humans. Flies are abundant during monsoon, and the density of tabanids is influenced by rainfall (Vasudeva, 2007a) ^[69]. The females lay eggs in masses on vegetation overhanging in waterbodies. The hatched larvae predate on invertebrates and can spend more than one season. Pupation occurs underground; the pupa being

positioned vertically in the substrate. The whole life cycle of tabanids is completed in 4-5 months under favorable conditions.

Materials and methods

In this study five mandals of Warangal district were included which consists of sixteen villages (Laknavaram, Chalcwai, Hasanparthi, Geeskonda, Laknepally, Govindraopet, Narsampet, Kazipet, Dharmasagar, Panthini, Singaram, Mamnoor, Bollikunta, Chintagattu, Mupparam, Pedapendyala of erstwhile district of Warangal, Hanamkonda and Mulugu area.

Morphological identification of adult flies was carried out by using keys provided by Kapoor *et al.*, (1990); Veer (2004) ^[25, 70]; Burton (1978); Stone and Philip (1974) ^[64]; Burger and Chainey (2000). The characters for morphological identification of fly included color of fly; length of fly; eyes and eye banding pattern; frons length and width ratio; shape, size, color of basal callus, median callus and sub callus; antennal shape, size, color, tomentum and number of annulations of flagellum; basic oostoma with or without setae, color of veins, structure and number of apical

band, number of rosettes or pale transverse streaks, presence or absence of appendix and color of the pterostigma of wing; abdomen and thorax with spots, stripes or bands of various shape and size either median, submedian or both, which are also taxonomically very much significant in various species of *Tabanids*. Colors of scutellum, presence of hair or tomentum are additional important characters.

Results

Morphological identification:

The characters for morphological identification of fly



Fig 1 A: *Haematopota montana* adult fly



Fig 1B: *Haematopota montana* abdomen

Observation: Medium sized species prevalent during May to July in the Warangal district of Telangana.

Details of the fly collected from: INDIA, Telangana, Warangal district Bollikunta 7° 53' 30" N, 79° 36' 54" E, 280 A, Singaram 17.9689° N, 79.5941° E, 302 A Panthani, 17.9° N 79.6° E, 270 A Mamnoon, 17.93800° N 79.52370° E, 285 A Hasanaparthi, 18°04'05" N, 79°31'25" E, 262 A Kazipet 7° 58' 0" N (17.9667°), 79° 30' 0" E (79.5000°) 304 A Chintagattu, 18°04'04" N, 79°29'39" E, 263.

Identification

A small greyish-brown fly measuring about 7.5–8.5 mm in length. The frons is grey, brown, slightly wider at the base, with a small central frontal spot. Paired circular spots are large and touch the eyes but are separated from the callus. The callus is brown, broad, and low, touching the eyes and showing a slight median projection above with a weakly curved lower edge. The subcallar region has a prominent black spot between the antennae. The face and parafacial areas are greyish yellow, often with dark markings on the upper face, while the upper parafacial region is irregularly mottled brown. The beard is white. The eyes are bare, larger than the thorax, and show three green zig-zag bands. The antennae have a shiny dark reddish scape, a pedicel with a small dorsal projection, and a reddish-brown flagellum that darkens toward the tip; it is long, slender, and only slightly tapers, with the first flagellomere slightly shorter than the

included color of fly; length of fly; eyes and eye banding pattern; antennal shape, size, color, number of annulations of flagellum; basi costa with or without setae, color of veins, structure and number of apical bands.

The collected flies were grouped into large, medium and small flies based on the body size. The size of the fly was variable, small (about 10 mm long or less), medium (about 15–18 mm long or less), large (18–20 mm long more).

1. *Haematopota montana*

scape. The palpus is dark reddish grey with black hairs. The thorax is brown with a pair of distinct triangular markings behind the transverse suture and a strong grey band before the scutellum; the scutellum is dark and the pleuron is grey. The wings are 7.3–8.7 mm long, brownish with a typical pattern of pale markings, including a complete, slightly broad, nearly straight subapical band and pale triangular markings in all posterior cells. The haltere has a brown knob. The legs are variably dark and pale: the fore coxa is grey with a darker apex, the femur is dark brown, and the fore tibia is about two-fifths white. The mid tibia has two pale bands, while the hind tibia shows a basal white band and a faint subapical pale spot. The basal tarsi of the mid and hind legs are white on their basal half. The abdomen is dark brown with pale segmental margins, a narrow mid-dorsal stripe, and pale lateral spots on the posterior segments, while the underside is dark with broad grey bands between segments (Fig. 1A, B).

Host: cattle, buffalo, horse, wild herbivorous and carnivorous animals.

Observation: This species is active from May to July in the Warangal region. It is closely related to *Haematopota brevis*, but can be distinguished by its fully developed, slightly broad, and almost straight subapical band, along with all posterior cells showing distinct pale triangular markings.

2. *Chrysops dispar*



Fig 2 A: *Chrysops dispar* adult fly



Fig 2B: *Chrysops dispar*



Fig 2C: *Chrysops dispar* head & antenna

(II segment of abdomen inverted V shaped mark)

Details of the fly collected from: INDIA, Telangana, Warangal district Bollikunta 7° 53' 30" N, 79° 36' 54" E, 280 A, Singaram 17.9689° N, 79.5941° E, 302 A Panthani, 17.9° N 79.6° E, 270 A Mamnoon, 17.93800° N 79.52370° E, 285 A Hasanaparthi, 18°04'05" N, 79°31'25" E, 262 A Kazipet 7° 58' 0" N (17.9667°), 79° 30' 0" E (79.5000°) 304 A Chintagattu, 18°04'04" N, 79°29'39" E, 263.

Identification

A small, slender fly measuring about 5.8–6.3 mm in length, with a yellow and black coloration pattern. The frons is yellow and about as long as it is wide, with a broad, shiny black callus. The vertex and area around the ocelli are glossy black, while the front clypeus is yellowish-brown with darker lateral shading and a pale yellow, hair-like median stripe. The maxillary palpi are light reddish-brown. The eyes are bare and appear black in preserved specimens, and the ocelli are well developed. The antennae are long and thin, with a yellow-brown scape, light brown pedicel, and a dark brown to black flagellum; all segments are roughly similar in length. The thorax is mainly black, with golden yellow hairs near the transverse suture and apex, and a dark brown to black scutellum. The legs are pale yellow brown to brown, with darker coxae and hind femur; the hind tibia is slightly swollen. The wings are 6.4–7.2 mm long, transparent, and marked by a broad dark band along the costal margin extending to the wing tip, along with a transverse band reaching from the costal to the anal margin and leaving a clear patch toward the rear. The abdomen is yellow with distinctive black markings: a narrow band on the posterior edge of the first tergite, a broad inverted V-shaped mark on the second tergite extending onto the third and sometimes fourth, and variable dark lateral margins on tergites two to six. The first to fifth sternites are yellow, while the sixth and seventh are brown to black (Fig.2 A, B, C).

Host: Cattle, buffalo

Observation: This species is identified by a distinctive inverted V-shaped dark mark on the abdomen extending up to the third abdominal segment (tergite III). It is found in the Warangal district of Telangana during May and June, and it

typically feeds on the forelegs and neck regions of cattle and buffalo.

Discussion

Warangal district of Telangana possesses a rich diversity of flora and fauna, including a wide variety of mammals and birds, which provides a favorable ecosystem for the survival and development of tabanid flies. The diverse habitats support all developmental stages of these flies. Females typically oviposit on grasses and fallen bamboo vegetation located near water bodies, while the moist soil beneath accumulated plant biomass in forested areas and paddy fields offers suitable conditions for larval development and pupation (Chainey, 2004). Domestic livestock, particularly cattle and buffaloes reared in villages adjoining forest areas, provides an ample source of blood meals for adult female tabanid flies, thereby supporting their reproduction and contributing to the maintenance of local populations.

In the present study, a total of 7 species belonging five genera of tabanus were identified but here only 2 were mentioned related to Morphological characters of *Haematopota* and *Chrysop* Warangal district. In the present study, one species of genus *Haematopota* was recorded. The morphological description of *H. montana* concurrence with Stone and Philip, 1974, Kapoor *et al.*, 1990, Veer, 2004 and Vasudeva *et al.* 2007b^[25, 64, 69, 70]. The identification of *C. dispar* was in concurrence with Ricardo, 1911, Kapoor *et al.*, 1990, Burger and Chainey 2000, Veer, 2004 and Vasudeva *et al.*, 2007^[25, 61, 69, 70] b.

Conclusion

This is first report from Warangal district, Telangana to understanding the Morpho-taxonomic Characterization of tabanid vectors is crucial for developing effective management strategies to control the transmission of economically important diseases such as Surra, Anthrax, Blackleg, and Hemorrhagic septicemia. Such comprehensive data would support the implementation of timely and targeted vector control measures, thereby minimize disease spread and improving livestock health.

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