



Descriptions of two new species of *Culicoides* Latreille from Sundarbans, India with an adult key to the *ornatus* species group of the Oriental region (Diptera, Ceratopogonidae)

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Abstract

Two new species of biting midges, *Culicoides cornatus* **sp. nov.** and *Culicoides pileus* **sp. nov.** are described based on adults. The new species are compared to their congeners with close similarity. All specimens were collected from the Indian Sundarban Mangrove Forests, few specimens were mounted in glass slides and few were prepared for SEM study. Total 78 species under the genus *Culicoides* Latreille including the two new ones (6 species from *ornatus* species group) are described from India. An adult key of the *ornatus* species group from the Oriental Region is provided.

Key Words

Adult Key, India, New species, *ornatus* group, Sundarbans, Taxonomy

Introduction

Culicoides Latreille, 1809 is one of the most species rich genera of the family Ceratopogonidae with approximately 1368 valid species, 32 subgenera, 38 species groups, and 176 unplaced species described worldwide (Borkent and Dominiak 2020); so far 76 species have been reported from India (Chatterjee et al. 2020). Most female members of this genus are haematophagous and many species act as important vectors of pathogenic viruses, protozoans and filarial nematodes (Mellor et al. 2000; Borkent 2005). These midges are of great concern because they transmit blue-tongue (BT), Akabane and other viruses that cause disease in sheep, cattle and wild ruminants (Kettle 1977; Linley et al. 1983). The outbreak of the BT disease in Tamil Nadu (India) and its occurrence in many parts of India over the last few decades has affected millions of sheep and goats and other livestock (Ilango 2006). Immature stages of this genus can be found in a variety of aquatic or semi aquatic habitats, including tree holes, ponds, marshes, streams, various muddy and saturated organic materials, damp or

rotting vegetation, and manure (Kettle and Lawson 1952; Jamnback 1965; Borkent 2014; Shults and Borkent 2018).

The *ornatus* species group of this genus comprises of 33 species worldwide (Nandi et al. 2013; Borkent and Dominiak 2020) including 27 reported from the Oriental region (Table 1). Before this study, four species of the *ornatus* group have been reported from India: *C. peliliouensis* Tokunaga in Tokunaga and Esaki 1936, *C. aequalispinus* Nandi, Mazumdar & Das Gupta, 2013, *C. fuscitibialis* Nandi, Mazumdar & Das Gupta, 2013, and *C. pateli* Nandi, Mazumdar & Das Gupta, 2013. Members of the *ornatus* group can be recognised by the following characteristics: Eyes usually bare, seldom hairy; contiguous to moderately separated; hind tibial comb with 4 (rarely 5) tibial spines, the one nearest the spur longest; wing with second radial cell usually dark to tip but pale distally in some species; presence of two large sclerotised spermathecae with a vestigial one, sclerotised ring present or absent; male genitalia with well developed apicolateral processes, aedeagus usually with low basal arch and long, tapering, rather blunt distal process; parameres usually fused at bases, the