First documentation of two different arthropodan species *Conocephalus fuscus* (Fabricius, 1793) and *Humbertiella ceylonica* (Saussure, 1869) in Anna University Campus, Chennai, Tamil Nadu

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Abstract

The two arthropodan species *Conocephalus fuscus* (Fabricius, 1793) and *Humbertiella ceylonica* (Saussure, 1869) were first observed and documented in the Anna University Campus in Chennai, Tamil Nadu. Species were identified based on photographs. There have been prior reports of these two species in two distinct areas of the nation. *Humbertiella ceylonica*, a mantodean species, was discovered in India, whereas *Conocephalus fuscus* an orthopteran species was discovered in many countries and recently in Pakistan (Sadiq et al., 2017). Now both species were documented in Anna University, Chennai, Tamil Nadu.

Keywords: New record, Arthropoda, Orthoptera, Mantodea, Tamil Nadu

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Introduction

The majority of arthropods are terrestrial and can be found dwelling in plants, leaf mould, and under stones and logs (Goncalves et al., 2021). They play a very important role in maintaining the environment and are also useful for humans. For example, many insects pollinate plants, produce useful substances (bees wax), act as pest control (predators), and serve as food for other

animals and humans (Culliney, 2013). Thunberg (1815) erected the genus *Conocephalus*, with *Gryllus*, *Tettigonia* and *Conocephalus* serving as type species (Cigliano et al., 2023). The genus *Conocephalus* can be diagnosed small size in body. The largest genus in the Conocephaliini tribe, *Conocephalus* is distributed throughout the world of cosmopolitan. There are 151 species of *Conocephalus* in the world (Cigliano et al., 2023), of which 10 have been identified in India (Shishodia et al., 2010; Nagar and Swaminathan, 2016; Farooki and Usmani, 2018), with two of those species having been found in rice habitats (Chitra et al., 2000).

Mantids (Mantodea: Insecta), also referred to as praying mantis, are important predators in the ecology. They mostly eat beetles, butterflies, flies, grasshoppers and moths and they are skilled at mimicking and camouflaging their surroundings (Surehsan & Sambath, 2009). The way mantids elevate their two fore legs in a prayerful stance is how they got their common, popular moniker. They frequently spend hours together, motionless, with their heads turned 180°, waiting for their prey (Sureshsan, 2009). Mantis is diurnal and creatures that are drawn to lights at night. They are feeble flies that are typically observed perched on trees, shrubs, and herbs (Sathe & Vaishali, 2014). Approximately 2300 species of mantids fall under 434 genera worldwide (Ehrmanm, 2002). There have been reports of 162 mantis species from India, organised into 68 genera and six families (Mukherjee et al., 1995). The goal of the current study was to investigate the two arthropodan species that were initially discovered and recorded on the Anna University campus: *Humbertiella ceylonica* (Saussure, 1869) and *Conocephalus fuscus* (Fabricius, 1793). The current species' discovery has led to the creation of a new record for Tamil Nadu.

Material and Methods

Conocephalus and *Humbertiella* species were recorded from Anna University Campus, Chennai district, Tamil Nadu (Figure 1). The Gonypetidae and Tettigoniidae were studied through photographic records taken and visually observed in study area. It is the first record of *Conocephalus* and *Humbertiella* from Chennai, on the Bay of Bengal in eastern India, is the capital of the state of Tamil Nadu. The state's photographic catalogue is a helpful resource for Gonypetidae and Tettigoniidae identification. Therefore, an initial attempt was made to publish the colourful photos of Tamil Nadu's mantis and bush cricket. A digital camera (Vivo V20 SE) was used to take close-up pictures of arthropodan animals and their behavioural characteristics.

In order to record natural coloration and particular behavioural postures, live individuals from the field were photographed. In times before cameras were invented, mantises and bush crickets were gathered, conserved, and pictures of these preserved mantises and bush crickets were taken for recording purposes (photo catalogues). The basic keys found in the previously published research articles are used to identify the species level.

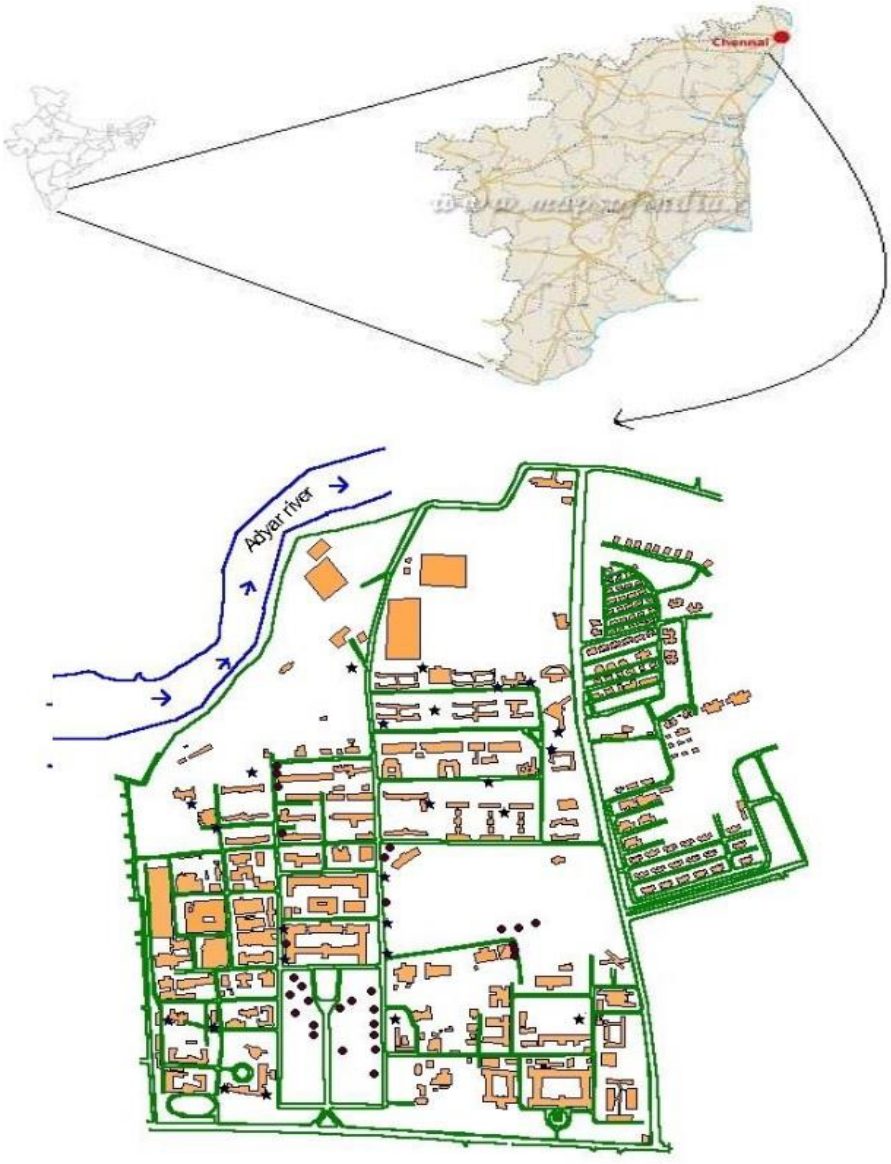

Figure 1. The map displaying the locations of the two new documented arthropod species, Humbertiella and Conocephalus.

Figure 2. Conocephalus fuscus: Currently identified based on photograph in Anna University, Campus in Tamil Nadu by Dr. S. Vijayan

Synonym.

Conocephalus discolor Thunberg, 1815

Conocephalus thoracicus Fischer von Waldheim, 1846

Conocephalus ponticus Nedelkov, 1907

Conocephalus turanicum Semenov, 1915

Conocephalus dilatatus Ramme, 1951

Conocephalus fuscus, Sadiq et al., 2017

***Diagnostic Characters*:** Head blackish green; a dark brown patch running from mid inter-ocular space to occipital sulcus with margins on both extremes not straight present. Eyes globular, projected outwards and black in colour with bright yellow rim basally. Antenna: Longest antenna

and dull brown throughout with base of each flagellomere darker. Legs with tibia and femur well distinguished. Fore and Hind legs: femur half black with green and another half slight black with pale brown. Tibia blackish brown in colour. Tarsus of each leg are blackish slight brown. Claw also same like tarsus.

Material Examined: 1 unknown adult, Anna University Campus, Chennai dist., Guindy, 19.xii.2024 coll. Dr. S. Vijayan

Distribution: Algeria, Bulgaria, Europe, Germany, Iran, Kazakhstan, Middle Asia, Mongolia, Northern Africa, Pakistan, Romania, Sweden, Switzerland, Spain and Tamil Nadu.

Remarks: This species can be found in a broad range of open environments, including meadow grasslands and thick forests. First record from Tamil Nadu.

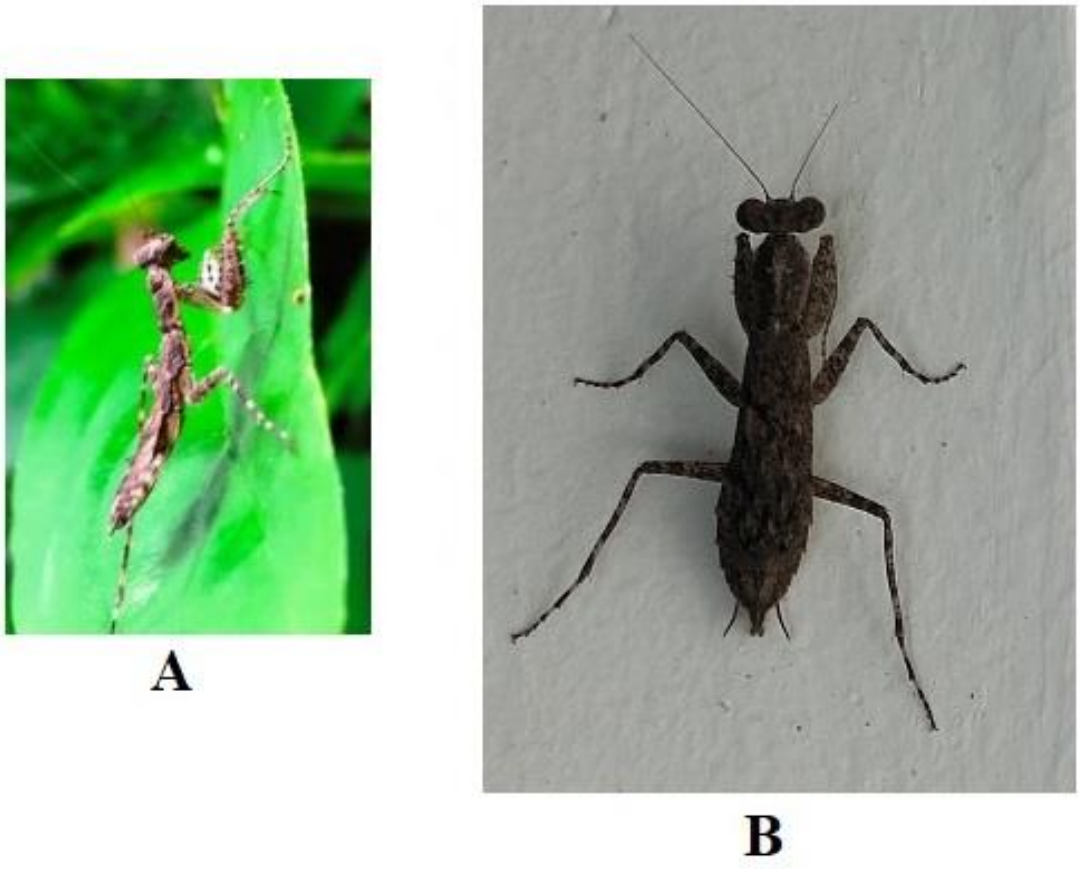

Figure 3. Humbertiella ceylonica: A) Deep et al., 2023 published in Gujarat and B) Dr. S. Vijayan, currently identified in Anna University, Campus in Tamil Nadu

Synonym.

1869. *Humbertiella ceylonica* Saussure. Mitt. Schweiz. Entomol. Ges., 3: 62.

1891. *Theopompa sepentrionum* Wood-Mason. A catalogue of the Mantodea., 2: 64.

1927. *Humbertiella ceylonica* Giglio-Tos. Das Tierreich., 50: 64.

2009. *Humbertiella ceylonica* Sureshan., 305: 1-56.

***Diagnostic Characters*:** Body deep brownish. Frontal sclerite black or blackish brown, superior margin less arched, usually brown in female; In foreleg coxae with 5-6 white, triangular and tubercular spines. Longer internal spines of fore femur brownish black; reaching up to 5-6 abdominal segments in female.

Material Examined: 1 female, Anna University Campus, Chennai dist., Guindy, 11.i.2024 coll. Dr. S. Vijayan

Distribution: Myanmar, India: Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Kerala, Karnataka, Madhya Pradesh, Maharashtra; Orissa, Tamil Nadu, Uttar Pradesh, West Bengal.

Remarks: This is a common widely distributed species found on tree trunks, soil and among litter. First record from Tamil Nadu.

Conclusion

The first record of *Conocephalus fuscus* (Fabricius, 1793) and *Humbertiella ceylonica* (Saussure, 1869) is from Chennai district, Tamil Nadu. Additionally, *Conocephalus* and *Humbertiella* species' distribution, habitat, descriptions, photos, and synonymy are recorded. These arthropodan species can be found in a wide range of open environments, including meadows with grasses, crops, and dense vegetation. Therefore, research on their pest status needs to be done. Additional surveys might uncover new species that contribute to this region's biodiversity.

Conflict of Interest

Author declares that there is no conflict of interest

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