



Diversity of short-horned grasshoppers (Orthoptera: Caelifera) in selected mangrove ecosystem and Kole Wetland of central Kerala, India

Thasnim E S*, Bijoy C

Department of Zoology, Shadpada Entomology Research Lab, Christ College, Irinjalakuda, Thrissur, Kerala, India

Abstract

The Caeliferan diversity in selected Kole wetland and mangrove ecosystem of Thrissur was documented for seven months from June to December 2018. A total of 11 species belonging to seven subfamilies and two families were recorded. Species richness was higher in the Kole wetland, but they were more evenly distributed in the mangrove ecosystem. The study was interrupted by the 2018 Kerala flood, and the grasshopper distribution in relation to the flood was recorded.

Keywords: orthoptera, caelifera, grasshopper, Kole Wetland, mangrove, diversity

Introduction

Orthopterans are the primary insect group representing grassland ecosystems, [1] comprising grasshoppers, crickets and katydids. The suborder Caelifera of order Orthoptera represents grasshoppers with lesser antennal segments (short-horned grasshoppers). About 29,009 grasshoppers are known so far from the world, [2] among which only 1033 species are recorded from India, [3] 140 species from Kerala [4, 5, 6, 7, 8]. The pest status of grasshoppers in India is one reason for the lack of information on their functional role in different ecosystems [5]. Being important primary consumers and contributing to the diet of many other animals, grasshoppers play a significant role in the functioning of grassland ecosystems [9, 10]. They are good indicators of the health and quality of different habitats and respond quickly to the changing environmental conditions [11]. But they remain less explored and no grasshopper species in India has so far been considered as a biodiversity indicator [4]. Prabakar and Radhakrishnan [12] documented four new reports of grasshoppers from Kerala while studying the orthopteran specimens of the Zoological Survey of India collection. Koya *et al.* [13] recorded 35 species belonging to five families from Palakkad, Kerala. Bhaskar *et al.* [4] compiled a checklist for Orthoptera of Kerala in which they reported 130 species of Orthoptera. Bhaskar *et al.* [5] studied the impact of fire management practices on the grasshopper fauna of Eravikulam National Park and Parambikulam Tiger Reserve, Kerala. Bhaskar *et al.* [14] rediscovered *Mopla guttata* Henry, from Western Ghats, Kerala, and described the first male specimen of the genus. Bhaskar *et al.* [6] recorded a new species *Tettilobus trishula*, from the Western Ghats of Kerala. The grasshopper diversity of the Kole wetlands and mangrove ecosystems of central Kerala was never documented. The present study aims to find the grasshopper diversity in two selected wetland ecosystems; mangrove and Kole wetland of the Thrissur district of Kerala state. The Kole wetlands are one of the largest, highly productive and threatened low lying wetlands located 0.5 - 1m bmsl. The Kole wetland, including paddy field greenery spread over the Thrissur and Malappuram districts of Kerala, recognized as one of the Ramsar sites during

2002 [15]. The 'Kole' is a local term in regional language (Malayalam) that refers to the bumper yield or high yield, which is a particular cropping pattern from December to May [16]. Mangroves, globally distributed on tropical shores, consist of trees, shrubs, climbers, and ferns adapted to saline and anoxic habitats which make mangrove plants structurally and functionally unique [17, 18, 19]. In Kerala, the maximum extent of mangroves is reported from Kannur (1100 ha), followed by Ernakulam (600 ha) and Kasaragod (315 ha). Thrissur has a minimum extent of 30 ha. of mangroves [20]. Human intervention is evident in both the Kole wetland and Mangrove ecosystem as paddy and aquaculture practices respectively. Since the impact of human intervention can significantly affect these ecosystems' faunal diversity, field surveys and faunal documentation programmes are needed to know the status and distribution of species to implement conservation efforts. No work has been reported so far on grasshopper diversity from these ecosystems of this region; hence this primary step on inventorying the grasshopper fauna of these ecosystems will form a foundation for carrying out future research in this area.

Materials and Methods

Two kinds of wetland ecosystems; Mangrove ecosystem in Vallivattaom (10°15'51.79" N and 76°11'31.18" E) and the Kole wetland of Muriyadu (10°21'51.46" N and 76°15'53.54" E) in Thrissur district, Kerala, India, were selected for monitoring grasshopper diversity. The study was conducted from June to December 2018.

A systematic collection of grasshoppers was done from both fields twice a month. The collection was done by net sweeping, covering a linear distance of 10m on a band of about 1m width [21]. Being cold-blooded organisms, grasshoppers place themselves on the vegetation surface to warm up during morning hours at low-intensity sunlight. [22] Hence, the collection was carried out during the morning hours from 9:00 am to 11:00 am. The collected specimens were killed by using ethyl acetate, spread, dried and preserved by pinning. Voucher specimens were preserved and deposited in Shadpada Entomology Research Lab