Chasing the sounds in the abode of clouds: a study on the cicada diversity of Meghalaya, India

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Introduction:

Cicadas are hemipterans that feed on xylem fluid, thus exploiting an underused resource of nature and making it available to their predators. This makes them a crucial component of the food web. While the diversity of Indian cicadas is under-documented, there is also a great lacuna in our understanding of their ecology, behaviour, acoustics and natural history.

We prepared the systematic inventory of cicadas in Meghalaya along with their calls and studied their natural history. The study greatly enhances the understanding of this previously under-studied group of insects from India, and shed light on the need of their conservation.

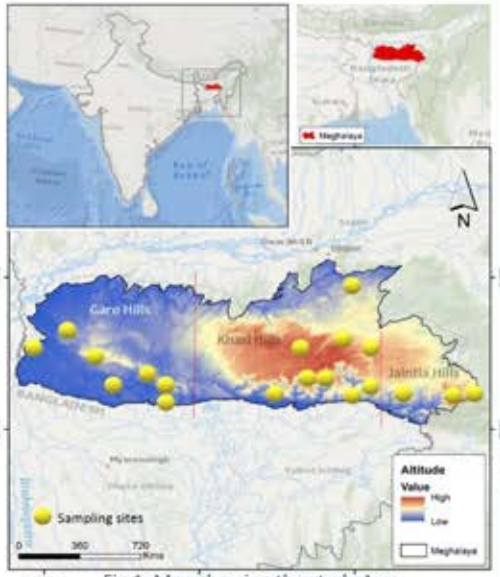

Fig.1: Map showing the study Area

Fig.2: Sampling cicadas across Meghalaya in motorbike.

Methodology:

The field work was carried out once every month in the Jaintia, Khasi and Garo hills by motorbike between March to October, 2017. Thirty-eight sampling sites (two in every locality) were surveyed periodically to document the annual species turnover. Cicadas were spotted using sono-guidance and the tymbalizing calls were recorded using unidirectional microphone with parabola and digital sound recorder.

Fig.3: Finding cicadas using Sono-guidance

Recorded individuals were collected and preserved in ethanol for taxonomic studies. Natural history such as behaviour, emergence, hostplants was recorded in the field using binocular and digital camera with telephoto lens. The species-specific activity periods were documented. Morphometric measurements were taken using Image-J. Calls were analysed using Reven pro. Village elders were interviewed about traditional cicada names and related folklores to understand the nature-culture linkages in the landscape.

Findings:

Earlier, 193 species of cicadas were reported from India while only 22 species were reported from Meghalaya. We recorded more than 60 species of cicadas from the study site in nine months. Among them, 44 are new report for Garo-Khasi-Jaintia Hill complex, eight are new report for India, and tentatively 11 species are new to science. We recorded calls for 61 of these species, which was a first of its kind effort from India; majority of these calls were recorded for the first time.

Fig.4: Cicadas of different species

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Additions to the cicada (Insecta: Hemiptera: Cicadidae) fauna of India: first report and range extension of four species with notes on their natural history from Meghalaya

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Additionally, the habitat preference, activity period, emergence timing and other natural history observations were made for every encountered species. Khasi and Garo cicada names and folklores are documented that are related to natural history of these insects.

This is the first systematic approach to document the acoustics of Indian Cicadas. They have species specific tymbalizing calls, hence the call database is essential to the field identification of cicadas. In addition, there are species that looks similar but have different tymbalization. This study provides the call library of the cicadas from Meghalaya and addressed many complexities in the taxonomy of multiple cicada groups.

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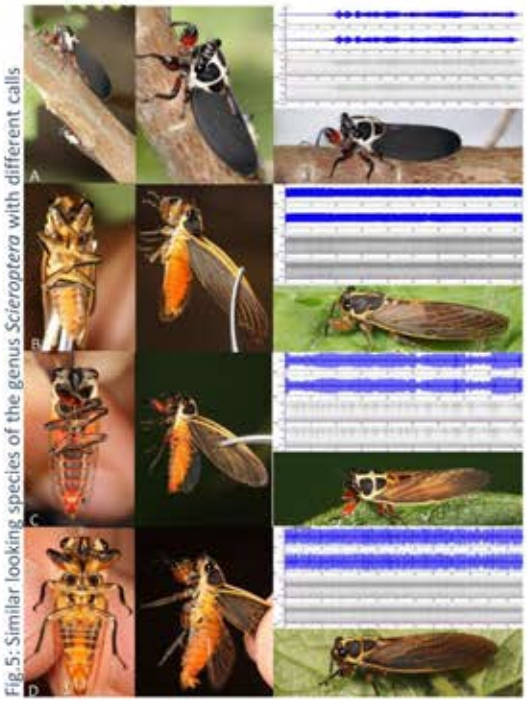

Fig.5: Similar looking species of the genus *Scieroptera* with different calls