

A CHECKLIST OF TETTIGONIIDAE (ORTHOPTERA : TETTIGONOIDEA) FROM UTTAR PRADESH STATE, INDIA

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A survey of Tettigoniid fauna of Uttar Pradesh State, India was carried out during the period 2013 to 2015. The collected material includes thirteen species belonging to ten genera and four subfamilies. Twelve species, nine genera and two subfamilies are reported for the first time from this region.

Key words : Tettigoniidae, Katydids, Bush-crickets, Uttar Pradesh, India.

INTRODUCTION

Tettigoniidae is a family of suborder Ensifera under the superfamily Tettigonoidea. The members of Tettigoniidae are commonly known as katydids and bush-crickets. They are also known as long horned grasshoppers, although, they are more closely related to crickets than to grasshoppers. Tettigoniidae possess long and cylinder antennae, usually longer than the body, four segmented tarsi and usually sword or sickle like ovipositors. These constitute an economically important group of Orthoptera pests that infest a number of cultivated and non-cultivated crops (Usmani *et al.*, 2010). Katydids are widely distributed throughout the world, but the majority of species can be expected in tropical and sub tropical regions, especially the New World tropics. The economic importance of these insects has been recognized all over the world. Tettigoniids are the important members of biological communities. They play the role of both herbivores and predators, and they are consumed by many vertebrates and invertebrates as the primary source of animal proteins.

In the recent years much progress in the field of Tettigoniidae due to the contribution of Ingrisch (1990), (Shishodia *et al.*, 1993), Ingrisch & Shishodia (1998 & 2000), Shishodia (2000a, b) who have worked on the Tettigoniid fauna of the Indian subcontinent especially from eastern India, Andaman and Nicobar Island. Ingrisch & Shishodia (1998) published the first results on the fauna of Tettigoniidae. There are about 6000 species of Tettigoniidae found in the world belonging to 1070 genera (Otte, 1997). Out of which only 160 species under 68 genera are reported from India (Shishodia *et al.*, 2010). No survey work so far has been done exclusively for this group from Uttar Pradesh, insufficiently known for its Tettigoniid fauna. There are very few reports on the taxonomy of Tettigoniidae from Uttar Pradesh state of India. Except for some sporadic reports, there is no systematic study on the katydids and bush-crickets belonging to the family Tettigoniidae from this state. Correct identification and knowledge on the biology is very essential for evaluation of the damage caused by the pests and also for developing suitable control measures. Keeping in mind the economic importance of these pests in an agriculturally developing country like India, it was decided to carry out a comprehensive plan of collecting and identifying the Tettigoniid fauna from Uttar Pradesh, India.

MATERIALS AND METHODS

Uttar Pradesh (Fig. 1) is a state situated between 23°52'N - 31°28'N latitudes and 77°3'E - 84°39'E longitudes and is bounded by Nepal in the North, Uttarakhand on the north-east, Himachal Pradesh on the north west, Haryana on the west, Rajasthan on the south-west, Madhya Pradesh on the south and south-west, and Bihar on the east. The climate of Uttar Pradesh is the tropical monsoon type, with warm weather year-round. Annual rainfall in the state ranges from 40-80 inches (1,000-2,000 mm) in the east to 24-40 inches (600-1,000 mm) in the west.

The Gangetic plain stretches across the entire length of the state from east to west. Much of the area of Uttar Pradesh is covered by a deep layer of alluvium spread by the slow moving rivers of the Ganges system. These extremely fertile alluvial soils range from sandy to clayey loam. Forests constitute about 12.8% of the total geographical area of the state. The Himalayan region and the terai and bhabhar area in the Gangetic plain have most of the forests. 120 specimens of adult long-horned grasshoppers were collected after monsoon period (from 15th September to 15th October of years 2013, 2014 and 2015) from different localities of Uttar Pradesh. These localities are Agra, Aligarh, Allahabad, Bareilly, Bijnor, Budaun, Ghaziabad, viz. Kanpur, Lucknow, Meerut, Moradabad, Muzaffarnagar, Rampur, Shahjahanpur and Varanasi. The surveys were done daily from 9 : 30 am to 12 : 30 pm and from 2 : 00 pm to 5 : 00 pm. They were caught by hand, forceps and entomological net. The net was used for catching insects individually or by sweeping on grasses, bushes and other vegetation. The collected specimens were killed with the help of ethyl acetate. The specimens were prepared, stretched and pinned. The present authors follow the Orthoptera Species File in classifying Tettigoniidae. The collected material is deposited in the Zoological Museum of the Aligarh Muslim University, Aligarh, India.

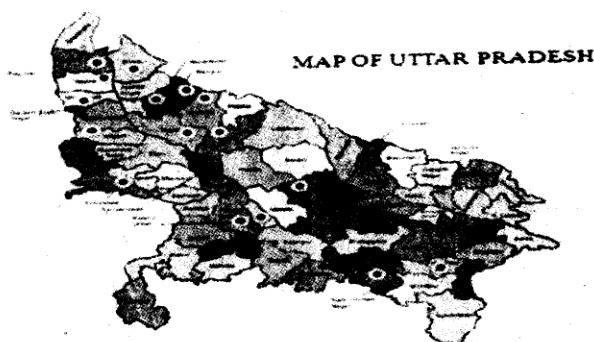


Fig. 1 : State of Uttar Pradesh with plan of Districts.

RESULTS

The material collected from different area and various localities of Uttar Pradesh state includes 120 specimens of Tettigoniids. The collected material includes thirteen species belonging to ten genera and four subfamilies (Table I). Twelve species, nine genera and two subfamilies are reported for the first time from this region.

Table I : Species of Tettigoniidae recorded from Uttar Pradesh State of India.**I. Subfamily Conocephalinae*****Conocephalus (Conocephalus) bambusanus (Ingrisch, 1990)******Distribution :** India : Uttar Pradesh and West Bengal.***Conocephalus (Anisoptera) maculatus (Le Guillou, 1841)******Distribution :** India : Andaman & Nicobar Islands, Arunachal Pradesh, Chhattisgarh, Himachal Pradesh, Jammu & Kashmir, Kerala, Madhya Pradesh, Maharashtra, Manipur, Mizoram, Nagaland, Orissa, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal.***Conocephalus (Conocephalus) bispinatus (Pitkin, 1980) ******Distribution :** India : Uttar Pradesh and West Bengal.***Euconocephalus pallidus (Redtenbacher, 1891) *******Distribution :** India : Andaman & Nicobar Islands, Assam, Chhattisgarh, Himachal Pradesh, Gujarat, Kerala, Meghalaya, Mizoram, Tamil Nadu, Uttarakhand, Uttar Pradesh and West Bengal.***Euconocephalus incertus (Walker, 1869)******Distribution :** India: Andaman & Nicobar Islands, Chhattisgarh, Madhya Pradesh, Meghalaya, Nagaland, Orissa, Pondicherry, Rajasthan, Sikkim, Uttar Pradesh and West Bengal.***Pyrgocorypha velutina (Redtenbacher, 1891) ******Distribution :** India : Uttar Pradesh and Arunachal Pradesh.**II. Subfamily Hexacentrinae*****Hexacentrus unicolor (Serville, 1831)******Distribution :** India : Andaman & Nicobar Islands, Himachal Pradesh, Manipur, Mizoram, Nagaland, Sikkim and Uttar Pradesh**III. Subfamily Mecopodinae*****Mecopoda elongata (Linnaeus, 1758)********Distribution :** India : Andaman & Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal.**IV . Subfamily Phaneropterinae*****Trigonocorypha unicolor (Stoll, 1787)******Distribution :** India : Andaman & Nicobar Islands, Karnataka, Meghalaya, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal.***Letana atomifera (Brunner von Wattenwyl, 1878)******Distribution :** India : Karnataka, Maharashtra, Rajasthan Tamil Nadu, Uttarakhand, Uttar Pradesh and West Bengal.

Phaneroptera gracilis* (Burmeister, 1838)

Distribution : India: Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Karnataka, Madhya Pradesh, Manipur, Orissa, Sikkim, Tamil Nadu, Uttarakhand and Uttar Pradesh.

Ducetia japonica* (Thunberg, 1815)

Distribution : India : Andaman & Nicobar Islands, Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Sikkim, Tamil Nadu, Uttar Pradesh and West Bengal.

Himertula kinneari* (Uvarov, 1923)**

Distribution : India : Bihar, Chhattisgarh, Gujarat, Himachal Pradesh, Karnataka, Maharashtra, Madhya Pradesh, Rajasthan, Uttar Pradesh and West Bengal.

Holochlora spectabilis* (Walker, 1869)

Distribution : India : Karnataka , Tamil Nadu and Uttar Pradesh

V. Subfamily Pseudophyllinae***Paramorsimus oleifolius* (Fabricius, 1793)***

Distribution : India : Maharashtra, Orissa , Tamil Nadu and Uttar Pradesh

Table captions : * : First time reported species from this region by present authors; ** : Species collected by present authors as well as reported by previous workers; *** : Species not collected by present authors but reported by other workers.

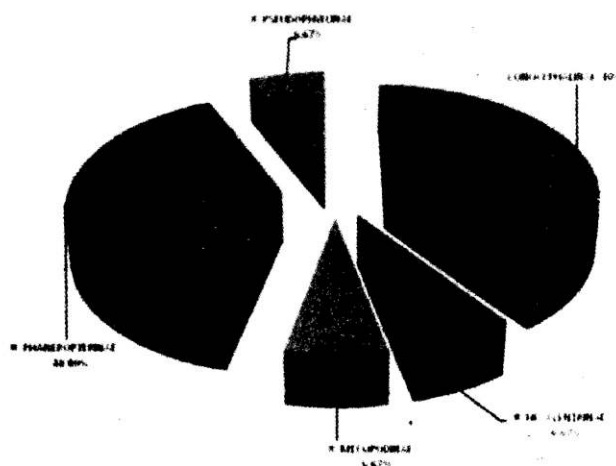


Fig. 2 : Percentage occurrence of different subfamilies of Tettigoniidae in Uttar Pradesh, India

DISCUSSION

Barman & Srivastava (1976), Shishodia (2000), Shishodia & Tandon (2000), Barman (2003), (Shishodia *et al.*, 2003 & 2010), Kulkarni & Shishodia (2005), (Senthilkumar *et al.*, 2006) and Senthilkumar (2010) have done some important work on the taxonomy and distribution of Tettigoniidae of North-eastern India. Ingrisch (1986 & 1990), Kevan & Jin (1993) found the records on the Tettigoniidae of India are scarce. It is thus not surprising that intensifying the research on the Tettigoniid fauna of India would reveal many new taxa and records. In the recent years much progress has been made in the field of Tettigoniidae due to the contribution of Ingrisch (1990), (Shishodia *et al.*, 1993), Ingrisch & Shishodia (1998 & 2000), Shishodia (2000a & b) who have worked on the Tettigoniid fauna of Indian subcontinent especially from Eastern India, Andaman and Nicobar Island.

Table II : Percentage occurrence of different subfamilies of Tettigoniidae in Uttar Pradesh, India.

S. No.	Subfamilies	Percentage	S. No.	Subfamilies	Percentage
1.	Conocephalinae	40%	4.	Phaneropterinae	40%
2.	Hexacentrinae	7%	5.	Pseudophyllinae	7%
3.	Mecopodinae	7%			

Ingrisch & Shishodia (1998) published the first results on the fauna of Tettigoniidae. Muralirangan *et al.* (2003) studied the bush-cricket fauna of Tamil Nadu. Senthilkumar, *et al.* (2006) reported the biodiversity of various subfamilies of Tettigoniidae from Gibbon Wildlife Sanctuary, Assam. Kailash & Gupta (2009) revised various genera and species of Tettigoniidae from Madhya Pradesh and Chhattisgarh. (Koli *et al.*, 2010) revised 12 species and 11 genera from Chandoli National Park, Maharashtra. Shishodia *et al.* (2010) reported 03 species under 03 genera belonging to 03 subfamilies of Tettigoniidae from Uttar Pradesh. Two species *Mecopoda elongata* (Linnaeus, 1758) and *Himertula kinneari* (Uvarov, 1923) reported by (Shishodia *et al.*, 2010) were not found during the sampling. The collected material includes 13 species belonging to 10 genera and 04 subfamilies (Fig. 2; Table II). Twelve species, nine genera and two subfamilies are reported for the first time from this region (Table II). Shishodia *et al.* (2010) were unable to find the subfamilies Hexacentrinae and Pseudophyllinae from this region. So, the present study is a distinct addition to the Tettigoniid fauna of Uttar Pradesh.

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