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Research article

DIVERSITY OF GRASSLAND AUCHENORRHYNCHA (CICADIDAE, CERCOPIDAE, CICADELLIDAE AND FULGORIDAE) IN MADHYA PRADESH AND CHHATTISGARH, INDIA

Kailash Chandra¹, Sandeep Kushwaha², Maya Ghosh¹, Biswabrota Biswas¹ and Animesh Bal¹

Zoological Survey of India, 'M' Block New Alipore Kolkata, West Bengal, India¹
Zoological Survey of India, Central Zone Regional Centre, Scheme No. 5, Plot No. 168-169, Vijay Nagar, Jabalpur-482 002 Madhya Pradesh²

(Email: kailash611@rediffmail.com)

ABSTRACT: Suborder Auchenorrhyncha includes short-horned bugs, having antennae usually small and inconspicuous; when long, they appear slender and filamentous or two segmented. Present study reports 53 species belonging to 37 genera and 8 families of suborder Auchenorrhyncha from Madhya Pradesh and Chhattisgarh. Of these, Infraorder Cicadomorpha represents 44 species, including 10 species belonging to 7 genera of family Cicadidae, 4 species belonging to 4 genera of Superfamily Cercopoidea, 30 species belonging to 20 genera of family Cicadellidae, while Infraorder Fulgoromorpha represents 9 species belonging to 6 genera of Superfamily Fulgoroidea. Present paper also includes 9 new records from Madhya Pradesh and 10 new records from Chhattisgarh.

Keywords: Auchenorrhyncha, Cicadomorpha, Fulgoromorpha, Madhya Pradesh and Chhattisgarh.

INTRODUCTION

The state of Madhya Pradesh was created in 1956 and later on in November 2000, Chhattisgarh was carved out from Madhya Pradesh. Total area of these two states is 4,43,446 sq. km. lying between 21^o to 25^o N and longitudes 74^o to 84^o E, covering about 14.5% of the total area of India. The elevation is largely 305 to 610 msl. As per records total forest area of Madhya Pradesh is 308,245 km² and annual rainfall 1800 mm and temperature ranges 22.5^o-25^oC. However, the forest area of Chhattisgarh is 135,191 km² and annual rainfall 1700 mm and temperature ranges 11^o-47^oC [1 & 2].

Auchenorrhyncha is a polyphyletic group of insects within the order Hemiptera. The order is currently divided into five homophyletic suborders [3, 4 & 5]. Two of these, Fulgoromorpha (plant-hoppers) and Cicadomorpha (leaf-hoppers) belong to Auchenorrhyncha. The three others are Heteroptera (true bugs), Sternorrhyncha (jumping lice, plant lice, scale bugs and mealy bugs) and Coelorrhyncha, only occurring in the tropics. The Auchenorrhyncha has developed during the Lower Permian period and at least 40,000 recent species are known to science, with many thousands yet to be described [6]. Auchenorrhyncha includes cicadas, spittle-bugs or froghoppers, leafhoppers, treehoppers, and plant-hoppers. Plant-hoppers and leafhoppers are hemimetabolic insects that suck plant juices. Of these, only two species of *Finnish* belonging to family Achiliidae, feed on subcortical fungal mycelia. The suborder Auchenorrhyncha was divided into two infraorders [7, 8 & 9]. Infraorder Cicadomorpha has four superfamilies Cicadoidea (Cicadas), Cercopoidea (Spittlebugs), Membracoidea and Cicadelloidea (Leafhoppers and Treehoppers), and Infraorder Fulgoromorpha with only superfamily Fulgoroidea (Planthoppers). A detailed account of Homoptera fauna of central India had been done by Distant [10, 11 & 12]. Later on scattered account of this order were published by Ghosh & Biswas [13] from Chhattisgarh, followed by Chandra [14 & 15] and [16] from Madhya Pradesh.

MATERIALS AND METHODS

Bugs were collected during various extensive and local surveys undertaken by the scientific team of Zoological Survey of India, Jabalpur from Madhya Pradesh and Chhattisgarh state. Lots of examples of Homopteran bugs were collected by using the light trap, net-sweep and hand picking methods from different national parks, wildlife sanctuaries and various local spots. Collected bugs were sorted out, pinned and identified with the help of reference collection and literature present in ZSI (Jabalpur Centre and HQs Kolkata) and *Fauna of British India* (10, 11 & 12). Microscopy was done by Leica M205-A Stereo zoom microscope and photographs were taken by Sony DSC-W55 Camera.

Table.1: List of Auchenorrhyncha studied from Madhya Pradesh and Chhattisgarh.

S. No.	Suborder / Infraorder / Superfamily / Family / Species	No. of exs.	Collection localities (District/State)	Date of Collection
	Suborder: Auchenorrhyncha			
	Infraorder: Cicadomorpha			
	Superfamily: Cicadoidea			
	Family : Cicadidae			
1	<i>Platypleura octoguttata</i> (Fabricius)	1	Bilaspur (C.G.)**	18.V. 2005
2	<i>Platypleura sphinx</i> (Walker)	1	Seoni (M.P.)*	19.VI. 2001
3	<i>Platypleura basialba</i> Walker	2	Hoshangabad (M.P.)*	19.XI. 2001
4	<i>Lemuriana apicalis</i> Germ.	1	Seoni (M.P.)*	20.VI. 2001
		1	Mahasamund (C.G.)**	01.VII. 2011
5	<i>Terpnosia collina</i> Distant	1	Bilaspur (C.G.)**	13.VI. 2004
6	<i>Terpnosia versicolor</i> Distant	2	Bilaspur (C.G.)**	13.VI. 2004
7	<i>Rustia tigrina</i> Distant	1	Bilaspur (C.G.)**	14.VI. 2004
		2	Bilaspur (C.G.)	25.VI. 2004
8	<i>Scieroptera splendidula</i> (Fabricius)	2	Bilaspur (C.G.)**	23.VII. 2004
9	<i>Haphsa nicomache</i> Walker	1	Hoshangabad (M.P.)	07.IV. 2001
10	<i>Cryptotympana intermedia</i> (Sign.)	2	Hoshangabad (M.P.)*	06.VI. 1999
	Superfamily : Cercopoidea			
	Family : Aphrophoridae			
11	<i>Aphrophora</i> sp.	1	Jabalpur (M.P.)	28.VII. 1970
	Family: Cercopidae			
12	<i>Callitettix versicolor</i> (Fabricius)	7	Jabalpur (M.P.)	13.VIII. 1975
		5	Raisen (M.P.)	08.XII. 2010
		9	Damoh (M.P.)	24.VIII. 2009
13	<i>Poophilus costalis</i> (Walker)	3	Bastar (C.G.)**	09.II. 1990
14	<i>Clovioa conifer</i> (Walker)	2	Bastar (C.G.)	08.II. 1990
	Superfamily:Cicadelloidea			
	Family: Cicadellidae			
15	<i>Aconura colombensis</i> (Melich.)	1	Hoshangabad (M.P.)	10.VI. 1999
		1	Jabalpur (M.P.)	26.IX. 2000
		2	Mandla (M.P.)	12.X. 1963

16	<i>Aconura dindorensis</i> (Pruthi)	2	Dindori (M.P.)	01.XI. 2007
17	<i>Aconura tolla</i> (Pruthi)	1	Mandla (M.P.)	29.X. 1963
18	<i>Peragallia sinuata</i> (M. & R.)	2	Hoshangabad (M.P.)*	06.VI.1999
19	<i>Arya rotunda</i> (Pruthi)	1	Mandla (M.P.)	21.X. 1963
20	<i>Exitianus indicus</i> (Distant)	2	Mandla (M.P.)	25.X. 1963
21	<i>Exitianus manus</i> (Distant)	3	Mandla (M.P.)	18.I. 1962
22	<i>Betrachomorphus indica</i> (Lith.)	1 4	Mandla (M.P.) Hoshangabad (M.P.)	27.V. 1961 06.VI. 1999
23	<i>Betrachomorphus ocellatus</i> (Pruthi)	1	Hoshangabad (M.P.)	16.VI. 1999
24	<i>Chiasmus alata</i> (Pruthi)	1	Dindori (M.P.)	01.XI. 2007
25	<i>Chiasmus (=Kortwa) mustelinus</i> (Distant)	2	Mandla (M.P.)	04.X. 1980
26	<i>Cicadula indica</i> (Pruthi)	2	Dindori (M.P.) Mandla (M.P.) Jabalpur (M.P.)	01.XI. 2007 29.X. 1963 20.IX. 2000
27	<i>Cofana spectra</i> (Distant)	5	Jabalpur (M.P.)	01.IX. 1970
28	<i>Dio facialis</i> (Distant)	2	Hoshangabad (M.P.)	09.VI. 1999
29	<i>Eugnathodus (=Nesosteles)</i> <i>sanguinescens</i> (Kirk)	1 2	Hoshangabad (M.P.) Mandla (M.P.)	07.VI. 1999 08.III. 2004
30	<i>Idioscopus athkinsoni</i> (Lith.)	2	Mandla (M.P.)	15.VI. 1982
31	<i>Idioscopus clypealis</i> (Lith.)	1	Mandla (M.P.)	18.I. 1990
32	<i>Ledra mutica</i> (Fabr.)	2	Bilaspur (C.G.) Bilaspur (C.G.)	13.VI. 2004 21.VI. 2006
33	<i>Ledra dorsalis</i> Walker	1	Bilaspur (C.G.)** Bilaspur (C.G.)	10.VI. 2004 17.V. 2005
34	<i>Hecalus albomaculatus</i> (Distant)	1 1 2	Dindori (M.P.) Mandla (M.P.) Hoshangabad (M.P.)	01.XI. 2007 11.III. 2004 28.VIII. 2000
35	<i>Hecalus arcuata</i> (Motsch.)	3	Mandla (M.P.)	10.IX. 2003
36	<i>Hecalus mandlensis</i> (Pruthi)	2	Mandla (M.P.)	10.IX. 2003
37	<i>Hecalus porrectus</i> (Walker)	1 1	Dindori (M.P.) Mandla (M.P.)	01.XI. 2007 08.III. 2004
38	<i>Parvana indra</i> (Distant)	1	Hoshangabad (M.P.)	28.VIII. 2000
39	<i>Phrynomorphus indicus</i> (Distant)	2	Dindori (M.P.)	01.XI. 2007
40	<i>Thamnotettix veinatus</i> (Pruthi)	1	Shahdol (M.P.)	12.X. 1976
41	<i>Ulopa brunnea</i> (Pruthi)	1	Narsinghpur (M.P.)	21.XII. 1964
42	<i>Nehela bimaculicollis</i> (Stal.)	1	Hoshangabad (M.P.)	24.VIII. 2000
43	<i>Nephotettix virescens</i> (Fabr.)	2	Hoshangabad (M.P.)	22.VIII. 2000
44	<i>Goniagnathus punctifer</i> (Walker)	2	Bastar (C.G.)	07.II. 1990
	Infraorder: Fulgoromorpha			
	Superfamily: Fulgoroidea			

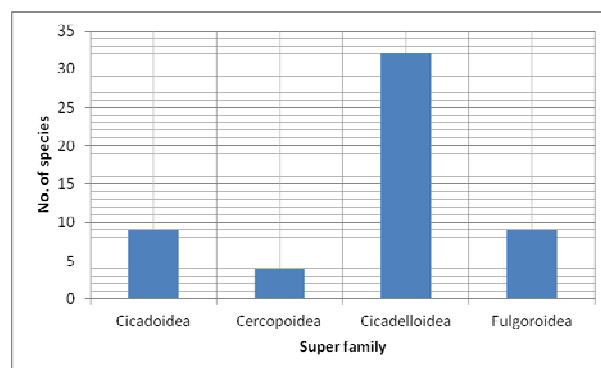
	Family :Cixiidae			
45	<i>Ptoleria deusta</i> (Distant)	1	Narmada River Basin (M.P.)*	Chandra <i>et al</i> 2010
	Family:Dictyopharidae			
46	<i>Dictyophara pallida</i> Don.	2	Seoni (M.P.)*	26.VII. 2001
47	<i>Dictyophara lineata</i> Don.	1	Seoni (M.P.)	27.VII. 2001
		1	Hoshangabad (M.P.)	24.VIII. 2000
		1	Jabalpur (M.P.)	26.IX. 2000
48	<i>Dichoptera hyalinata</i> (Fabricius)	1	Seoni (M.P.)	08.X. 2007
49	<i>Dictyopharina consanguinea</i> Distant	1	Seoni (M.P.)*	21.VII. 2001
50	<i>Dictyopharina viridissima</i> Melichar	2	Seoni (M.P.)*	29.VII. 2001
	Family :Fulgoridae			
51	<i>Zanna chinensis</i> Distant	1	Chhindwara (C.G.)**	15.III. 2001
52	<i>Zanna chennelli</i> Distant	1	Chhindwara (C.G.)**	03.IX. 2001
	Family: Eurybrachidae			
53	<i>Eurybrachys tomentosa</i> (Fabricius)	3	Mahasamund (C.G.)	01.VII. 2011

Abbreviation used: M.P. - Madhya Pradesh; C.G. – Chhattisgarh, * New Record from Madhya Pradesh; ** New Record from Chhattisgarh.

RESULTS AND DISCUSSION

Present investigation reports altogether 53 species pertaining to 4 superfamilies of suborder Auchenorrhyncha from Madhya Pradesh and Chhattisgarh. Despite the present findings, there is scope for record of many species from Central India, if intensive surveys of unexplored areas are undertaken.

Although, the study of 53 species of Auchenorrhyncha into the conservation process of grassland ecosystem is going to be limited in this large area, because of insufficient knowledge of ecology, biology, species distribution, and their host-pest relationship, but the future studies will have impact on conservation and management of grassland ecosystem diversity. Present study also reports 9 new records from Madhya Pradesh belonging to 4 families; Cicadidae (04), Cicadellidae (01), Cixiidae (1) Dictyopharidae (3) and 10 new records from Chhattisgarh representing the families Cicadidae (6), Cercopidae (1), Cicadellidae (1) and Fulgoridae (2). The list of species of the suborder Auchenorrhyncha studied from Madhya Pradesh and Chhattisgarh is given in Table -1.



Graph representing the number of species in various superfamilies of Auchenorrhyncha

Plate - 1
Family - Cicadidae



Cryptomyzomma intermedia (Sign.)



Platyleura basialba Walker



Platyleura octoguttata (Fabr.)



Rustia tigrina Dist.



Scieroptera splendidula (Fabr.)



Terpnostia coltina Dist

Plate - 2
Family - Cicadidae



Terpnostia versicolor Dist.



Haphsa nicomache Walker



Lemuriana apicalis Germ.

Family - Cercopidae



Poophilus costalis (Walker)



Callitettix varicolor (Fabricius)

Plate - 3
Family - Fulgoriadae



Furrybrachys tomentosa (Fabricius)



Dichoptera hyalinata (Fabricius)



Dictyopharina consanguinea Dist.



Dictyopharina viridissima Melich.



Dictyophora lineata Don.



Zanna chennelli Dist.



Zanna chinensis Dist.

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