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Species diversity and distribution of flower chafers (Coleoptera: Scarabaeidae) in Chhattisgarh, India

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Abstract
Surveys were carried out during March to July months of 2021 and 2022 to document the species diversity of Cetoniinae in selected locations of nine districts of Chhattisgarh viz., Raipur, Gariaband, Kabirdham, Balod, Rajnandgaon, Bastar, Surajpur, Surguja and Balrampur. The explorations yielded 29 specimens belonging to nine species of subfamily Cetoniinae. Nine species viz., *Coenochilus brunneus*, *Gametis versicolor*, *Glycosia tricolor*, *Protaetia alboguttata*, *Protaetia fusca*, *Heterorrhina elegans*, *Protaetia* species 1, *Protaetia* species 2 and *Gametis* species 1 were obtained from seven districts. The species diversity, distribution and dynamics across the districts are discussed.

Keywords: Scarabaeidae, species diversity, Chhattisgarh, cetoniinae

Introduction
Chhattisgarh is rich with diverse groups of flora and fauna. Geographical location of Chhattisgarh state is in between 80° 15' to 84° 24' E and 17° 46' to 24° 5 N. It is covered by dense forest and hills. The present study reveals several species of Coleoptera order in Chhattisgarh. Coleoptera is one of the largest orders of class insect and are cosmopolitan in distribution. Overall 3, 50, 000 species of beetles are identified all over the world (Choate, 2001) [4], and about 1,5088 species are found in India (Kazmi and Ramamurthy, 2004) [7]. Flower chafer are a group of scarab beetles, comes under the subfamily Cetoniinae. Many species are diurnal and visit flowers for its pollen and nectar, or to browse on the petals. Some species feed on fruit also. The group is also known as fruit and flower chafers, flower beetles and flower scarabs (Subfamily Cetoniinae). There are around 4,000 species, many of them still undescribed. Many of a group of beetles in the family Scarabaeidae (Insect order Coleoptera) that are distributed worldwide and are brilliantly coloured, with the majority of the iridescent species occurring in the tropics. Most measure less than 12 mm (0.5 inch), although a few well-known ones are longer.

Materials and Methods
The study was done in nine districts *viz* Raipur, Gariaband, Kabirdham, Balod, Rajnandgaon, Bastar, Surajpur, Surguja and Balrampur. The adult chafers were collected from various region of Chhattisgarh during 2020-21 under the survey program. Light traps were placed with a 160w mercury bulb as a light source and operated from 6-11pm during March to July 2020 and 2021. Beetles were also collected by scouting shrubs and trees manually. The adults that were drawn to light were captured, placed in a container, and transported to the laboratory to be processed. The samples consisted mostly of adult males and females. Collected samples were processed in National Bureau of Agricultural Insect Resources (NBAIR), Bengaluru, Karnataka. Each specimen was then identified with available keys and literature such as the Fauna of British India volumes on scarabs (Arrow, 1910) [1] and available referral collections in ICAR-National NBAIR Insect Museum in Bengaluru.

Results and Discussion
A total of 29 beetle specimens were obtained through light traps and manual scouting, across Chhattisgarh covering nine districts *viz*., Raipur, Gariaband, Kabirdham, Balod, Rajnandgaon, Bastar, Surajpur, Surguja and Balrampur during the study period from March to July 2020 and 2021. The collected specimens were processed and identified up to species level using the available keys (Arrow, 1910) [1] and referral collection**.** Chandra and Gupta (2012) [3] studied diversity and relative abundance of pleurostict scarabaeidae (Coleoptera: Dynastinae,

Scarabaeidae, Rutelinae, Cetoniinae, Melolonthinae) in Achanakmar-Amarkantak Biosphere reserve, Chhattisgarh. 12 new records of darkling beetles to 07 districts of Chhattisgarh state viz; "Bilaspur, Raigarh, Koriya, Surguja, Durg, Raipur and Bastar". Chandra and Ahirwar (2007) [2] presented a faunistic account of the scarabaeid beetle of Madhya Pradesh and Chhattisgarh comprising about 124 species belong to 11 subfamilies and reported 9 species from subfamily Cetoniinae.

Table 1: Scarab species recorded from Chhattisgarh during the study period (March to September of 2020 and 2021)

Sl. No.	Species	Surguja	Bastar	Surajpur	Balrampur	Kabirdham	Rajnandgaon	Gariaband	Raipur	Balod	Total no	% Abundance
1	*Coenochilus brunneus*							2			2	0.08
2	*Gametis versicolor*								4		4	0.16
3	*Glycosia tricolor*				1						1	0.04
4	*Protaetia alboguttata*					1					1	0.04
5	*Protaetia fusca*	17									17	0.69
6	*Heterorrhina elegans*		1								1	0.04
7	*Protaetia* species 1					1					1	0.04
8	*Gametis* species 1			1							1	0.04
9	*Protaetia* species 2				1						1	0.04

Conclusion

The Phytophagous scarab species that includes white grubs and chafer beetles are in particular, economically important as they cause serious losses to the Agricultural, Horticultural, Forest crops and trees. An investigation was carried out in selected nine districts of Chhattisgarh for documenting the diversity and distribution of Scarabs. Adult beetles were collected using light traps and by manual scouting from March to August of 2020 and 2021. A total of 29 sample was collected comes under 5 genera with 9 species. *Protaetia fusca* have the maximumt no of sample on the population followed by *Gametis versicolor*.

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