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VARIATION IN SIZE OF *BATOCERA RUFOMACULATA* (DE GEER, 1755) (COLEOPTERA: CERAMBYCIDAE) IN KOLHAPUR DISTRICT, MAHARASHTRA, INDIA

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ABSTRACT
The cerambycid beetle commonly called Mango stem borer Batocera rufomaculata (De Geer, 1755) is a serious pest of about 35 different species of plants. It differs in its body size. The smallest specimen recorded during study from Kolhapur district is 39.47 mm and largest is 74.26 mm . The standard daviation about total body length is ± 9.33.The variation in body size of the same species is due to different host plant and different localities.

KEYWORDS: Batocera Rufomaculata, Mango Stem Borer, Size Variation.

INTRODUCTION
Batocera rufomaculata (De Geer, 1755) is a Cerambycid beetle of the family Cerambycidae of Coleoptera, commonly called a Mango stem borer. It was described by De Geer in 1755. It is found in Burma, China (Hainan, Xizhang), Indonesia (Java, Sumatra), Myanmar, Malaysia, Nepal, Pakistan, Sri Lanka, Thailand, Tibet, Vietnam, Egypt (Sinai), Israël, Iraq, Jordan, Lebanon,Oman, Syria, Turkey, Yemen, Solomon Islands, Barbados, Br. Virgin Isl. Isl. St. Croix, Isl. S. John, Isl. St. Thomas, Puerto Rico ; Africa: Comores Isl., Réunion, Mauritius, Madagascar, Maldives, Rodriguez, Seychelles and Socotr.[1] In India it is recorded in India Orientalis, Andaman and Nikobar, Arunachal Pradesh, Assam, Bihar, Jammu and Kashmir, Karnataka, Kerala, Manipur, Madhya Predesh, Maharashtra, Mizoram, Meghalaya, Nagaland, Punjab, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh, Chattis Garh and West Bengal.[1,2] *B. rufomaculata* is a serious pest of many economic plants like *Anacardium occidentale* (cashew nut),*Artocarpus heterophyllus* (jackfruit),*Casuarina equisetifolia* (casuarina),*Ceiba pentandra* (kapok), *Dyera costulata* (jelutong), *Ficus, Ficus carica* (fig),*Hevea brasiliensis* (rubber), *Mangifera indica* (mango), *Morus* (mulberrytree), *Persea americana* (avocado), and *Spondias* (purple mombin) (www.plantwise.org). Review of literature indicates, *B. rufomaculata* differs in size. Hence, by consideration of its variable body size, wide distribution range as well as the wide host-range, it has been decided to work on the variation of body size of *B. rufomaculata* found in Kolhapur district, Maharashtra, India.

MATERIAL AND METHODS
The specimens of *B. rufomaculata* were collected from different localities of Kolhapur district. They were brought to the laboratories, preserved dry and identified by following standard literature and webography. From study region in all 10 specimens of *B. rufomaculata* were measured for their head, pronotum and elytra length and antenna. The measurements of the body were taken by using digital Vernier Caliper along with photography.

RESULTS
The different sized *B. rufumaculata* are shown in Image 1. The length and width of the head, pronotum and elytra along with total body and antenna length is given in the Table 1. The results indicate that the head length ranges between 5.11 mm and 11.36mm while the range of head width is 6.76 mm to 12.5 mm. The pronotal length ranges between 6.55 mm to 10.90 mm and its width is between 12.83 mm to 20.34 mm. The size of single elytra ranges between 27. 81 mm to 53 mm long and 6.38 mm to 11.59 mm. The smallest *B. rufomaculata* recorded in the present study is measured 39.47 mm while largest is 74.26 mm in total body length. It indicates that there is ± 9.33 standard deviation of the body length of *B. rufomaculata.* The antennal length of the studied specimens is greatly variable with shortest 46 mm and longest 90 mm sized antenna.

Table. 1. Morphometry of *Batocera rufomaculata* showing measurements of antennae and total body length.

Sr. No.	Antennal length (mm)	Head		Pronotum		Elytra		Total body length (mm)
		Length (mm)	Width (mm)	Length (mm)	Width (mm)	Length (mm)	Width (mm)	
1	55.00	05.11	06.76	06.55	12.83	27.81	06.38	39.47
2	76.00	04.49	07.49	07.09	13.89	32.80	25.01	44.38
3	61.00	06.46	08.56	06.86	13.32	32.19	07.47	45.51
4	46.00	05.65	09.12	07.31	14.65	32.73	07.96	45.69
5	53.00	05.15	09.13	07.38	15.12	35.11	08.16	47.64
6	75.00	06.58	09.59	07.20	16.02	35.72	08.52	49.50
7	60.00	05.87	09.90	07.75	16.87	37.31	08.43	50.93
8	75.00	07.38	10.77	07.76	16.66	36.75	08.46	51.89
9	53.00	06.56	09.84	07.78	17.12	37.79	08.86	52.13
10	90.00	11.36	12.5	10.90	20.34	53.00	11.59	74.26

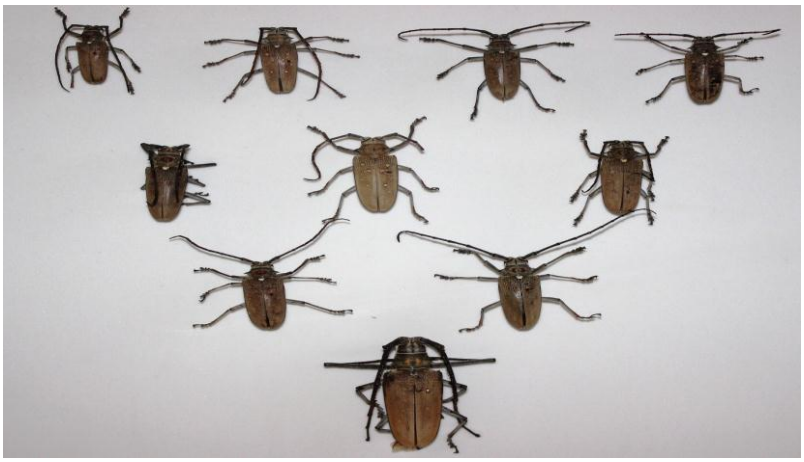

Image 1. Different sized *Batocera rufomaculata.*

DISCUSSION

The observations on the present study reveals there is great variation in the body size of species *B. rufomaculata* found in Kolhapur district. According to earlier workers the body size of *B. rufomaculata* is 38 mm – 63 mm,[3] 20 mm[4] and 50 mm.[5] The results of the present study are in accordance with the observations made by Beeson[3] and Srivastava.[6] The 20 mm sized *B. rufomaculata* was reported by Atwal and Dhaliwal[4] from the North Western region of India and hence such small sized specimen is not recorded during the present investigation due to the different region. The variation in the antennal size is depending on the sex of the beetle because of this there is variation in length of the antennae. In the growth of animals, nutrient and habitat play a significant role. Beeson[3] mentioned that *B. rufomaculata* is a pest of 33 different plant species.

CONLUSION

As the *B. rufomaculata* is having a wide host range, in the present investigation different sized specimens were recorded from Kolhapur district,Maharashtra, India which is part of the North Western Ghats ecoregion.

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