

THE TAXONOMIC STATUS OF THE PYGMY MICE OF CENTRAL PUNJAB ASSESSED ON THE BASIS OF SOME MANDIBULAR CHARACTERISTICS.

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Three forms of pygmy mice, delineated on the basis of the mandibular length, mandibular height, length of coronoid fossa, and breadth of moment arm of temporalis, have been recognised from central Punjab.

INTRODUCTION

The relationship between ecology and morphology is a significant one, presumably because the size and shape of an organism is related to its adaptedness and therefore, to the process of natural selection in populations. Thus, in many respects ecological and morphological adaptations are synonymous and changes in morphological structure can be accomplished by change in function (Holbrook, 1982). Feeding is of primary importance to organisms and morphological aspects of the feeding apparatus have been used to reveal ecological functioning (Findley, 1976, Smartt, 1978). Sibling species co-exist in an area by having different ecological niches which may be due to different feeding habits of these species. The morphometric differences in the mandible may be useful in segregating sibling species.

Two forms of pygmy mice viz. *Mus booduga* and *MUS dumni* have been reported from central Punjab (Rana, 1991, Zahira, 1993 and Rasul, 1993). The present study of the mandibular characteristics of the pygmy mice collected from central Punjab reveal existence of three forms of pygmy mice.

MATERIALS AND METHODS

A total of 3-11 specimens of mice was snap-trapped from the agricultural fields and non-crop areas of four districts viz., Shcikhupura, Jhang, Faisalabad, Toba Tek Singh of the province of Punjab (Pakistan). Four forms of mice were recognised on the basis of colour of their belly fur and hairs. These forms are as follows.

1. Pure white belly form (PW) Greyish brown dorsum and pure white ventral fur, the hairs being white throughout their entire length. The number of specimens examined was 186.

2. Grey base belly form (BC) Grey brown dorsum with white belly. The hairs of white ventral fur are grey about one fourth of their length from the base. The number of specimens examined was 36.

3. Greyish white belly form (GW) Brown grey dorsum with greyish white belly. The hairs of ventral fur are grey nearly half of their length from the base. The number of specimens examined was 103.

4. Light grey belly form (LG) Brownish grey back with light grey ventral fur. The number of specimens examined was 16. Barnell (1977) was followed for the following mandibular measurements of adult mice.

Mandibular Length: Measured from the plane formed by posterior point of angular and condyloid processes to posterior margin of incisor's entry into mandible.

Mandibular Height: Measured from the plane formed by ventral edges of angular process and mandibular body to dorsal point of coronoid process.

Length of coronoid Fossa: Measured from the plane formed by posterior point of angular and condyloid processes to anterior point of coronoid fossa.

Breadth of Moment Arm of Temporals: Measured from plane formed by anterior point of coronoid process and anterior edge of coronoid fossa to the posterior point of condyloid process.

RESULTS AND DISCUSSION

The mandibular measurements viz., mandibular length, mandibular height, length of coronoid fossa, and breadth of moment arm of temporals reveal that BC and GW forms are one and the same as they are not statistically different from each other with respect to any of these variates (Table 1).

Table 1. Duncan's multiple range test for the mandibular measurements of the four forms of the pygmy mouse.

Variates	Forms			
	PW	BG	GW	LG
Mand. Length	7.120 a	8.810 b	8.790 b	8.510 c
Mand. Height	5.470 a	5.250 b	5.310 b	5.030 c
Coronoid Fossa	6.720 a	6.5-10 b	6.500 b	6.350 c
Breadth of Moment arm of temporals	3.4-10 a	3.370 b	3.3-10 b	3.220 c

Means with similar letters are statistically non-significant.

The table also shows that PW and LG are different from each other as well as from BG and GW. As such the mandibular data of the present study reveal existence of three forms (species) of pygmy mice viz., pure white belly form (PW), greyish white belly form (BG + GW), and light grey belly form (LG) in central Punjab (Pakistan). Rana (1991) has recognised the same three forms of pygmy mice from central Punjab on the basis of cranial, bacular and body measurements. More recently Rasul (1993) and Zahira (1993) have reported presence of two forms of pygmy mice from the same general area.

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Moong generally requires only two to three irrigations and some times it requires even no irrigation till harvest. Therefore, it is mostly sown on marginal lands by the farmers. But since it commands a prominent position among the pulses, it warrants special attention of both researchers and policy makers. A study on determining the irrigation water requirements for maximizing moong yield was thus planned and conducted in the experimental area at the Post Graduate Agricultural Research Station, University of Agricultural, Faisalabad. The major objective of the study was to find out the effect of different depths of irrigation water on moong production and to work out suitable depth of irrigation for obtaining maximum yield of moong.

MATERIALS AND METHODS

Field experiment was conducted at the Post Graduate Agricultural Research Station (PARS) in RCB design with three replications. Irrigation was applied with the help of cutthroat flume (irrigation water measuring device). Moong was sown during the last week of June. All the doses of nitrogen and Phosphorus were applied at the time of sowing. The plot size was kept to be 7m x 21m.

Seed rate was maintained at 20 kg per hectare with row to row and plant to plant distance of 30 cm and 10 cm, respectively. All the other cultural practices were kept similar for all treatments. The data thus generated were analysed with the help of appropriate discrete analysis techniques as prescribed by CIMMYT (1988).

TREATMENTS

A = IRRIGATION FREQUENCIES

- Tr = No irrigation
- T2 = Application of 5 cm depth of irrigation water at the following stages.

- a) 2.5 cm at 30 days after germination
- b) 2.5 cm at flowering stage.
- T3 = Application of 7 cm depth of irrigation water at the following stages.
 - a) 3.5 cm at 30 days after germination
 - b) 3.5 cm at flowering stage.
- T4 = Application of 9 cm depth of irrigation water at the following stages.
 - a) 4.5 cm at 30 days after germination.
 - b) 4.5 cm at flowering stage.

For calculating depth of irrigation, the following formula was applied.

$$QT = 2BAD$$

$$Q = \text{Discharge (lps)}$$

$$T = \text{Time (hours)}$$

$$A = \text{Area (hectare)}$$

$$D = \text{Depth (centimeter)}$$

B. FERTILIZER APPLICATION LEVELS:

- a) Nitrogen = 25.0 kg/ha
- b) Phosphorus = 62.0 kg/ha
- c) Potash = 62.0 kg/ha

RESULTS AND DISCUSSION

Pods per plant: Differences in number of pods per plant were found to be significant among the irrigation treatment. LSD test indicated that maximum number of pods per plant (72) were observed in the Tt treatment, where irrigation water depth was kept at 2.5 cm. Minimum number of pods per plant (39.00) were recorded in T4 treatment where irrigation depth was kept 4.5 cm. Number of pods per plant in Tj and T3 treatments were found 41 and 46, respectively.