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FUNCTIONAL MORPHOMETRIC VARIATION OF *PEROMYSCUS GRATUS* FROM MEXICO

The traditional approach to the study of intrapopulational variation (secondary sexual, ontogenetic, and individual variation) has been to record several measurements of the skull and, by means of univariate and multivariate statistical techniques, define homogeneous groups (e.g. adulthood) for posterior comparisons among populations. This is a useful method for such purposes but considers only comparisons variable by variable. Because no cranial functional units are defined, group differences cannot be examined and discussed from a functional or ecological perspective.

In order to follow a functional approach, we defined in a skull of *Peromyscus gratus* seven functional units (Cranial Functional Components or CFC): one olfactory (volume of rostrum), one auditive (volume of bullae), one ocular (ocular area), one cerebral (volume of braincase), and three masticatories (masticatory area, food storing area, and length of ramus), calculated from 27 common linear variables from the skull and mandible in a sample of 249 *Peromyscus gratus* collected in south Mexico City. We examined the secondary sexual, ontogenetic, and individual variation of this sample in both CFC and traditional data sets. Our data analyses was based on standard univariate and multivariate statistical techniques as well as the procedures of Willig and Hollander (1995).

Our preliminary results from both the CFC and the traditional data sets showed similar patterns of morphometric differentiation. First, males and females do not differ statistically in any of the five age categories (based on tooth wear) that we recognized. Second, two age groups were differentiated: juveniles, which embrace age categories one to three, and adults, including age classes four and five. The comparison between the variation coefficients of the two groups showed no statistical difference. These results are similar to what Hoffmeister (1952) previously reported for *P. .ruei* (formerly conspecific with *P. gratus*). Although the traditional data and the CFC data sets share a similar pattern of morphometric variation, the CFC showed a trend where sexual dimorphism appears less, and, on the other hand, juveniles and adults are better identified. In addition, these data showed a higher degree of statistical independence among CFC.

In addition, when we compared the results of the secondary sexual and ontogenetic variation with published reports on population ecology of *Peromyscus*, a correlation between the morphologic patterns of morphometric differentiation and the differential use of resources becomes clear. For instance, there is no difference between the type of food items used by sex classes. In contrast, it is known that juveniles eat more soft food than adults, which eat more hard elements, such as arthropods. The use of the importance index proposed by Willig and Hollander (1995) in the CFC data set supported that mandibular as well as olfactory elements are quite important in the morphometric differentiation between juveniles and adults.

On the other hand, the results of the individual variation analyses in both CFC and traditional data sets do not support the results of other ecological studies, wherein juveniles have been reported to display a larger ecological niche than that of the adults. Our data did not show significant differences between the coefficients of variation of the two large age groups.

Because the results of the study of CFC agree well with those obtained from traditional variables used in systematics, and from population ecology, we propose the use of this type of morphometric studies as a bridge between systematics and ecology. Since CFC allow the identification of homogeneous groups for further taxonomic comparisons that systematics needs, they provide with tools to the ecologists to identify differences between individual groups of the same population.

LITERATURE CITED

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