

METHODS AND MATERIALS

A total of 164 adult specimens of *P. simulus* and *P. boylii* from the coastal region of western Mexico, including type and topotype specimens of *P. simulus*, were examined for 23 quantitative characters (see Specimens Examined for locality information). Adult specimens were examined and placed into three adult ages classes (IV, V, and VI) based on tooth wear (see Schmidly, 1973). Five external characters were recorded from specimens as follows: total length (TOL), length of tail (TAL), length of body (BDL), length of hind foot (HFL), and length of ear (EAL). Eighteen characters of the cranium were measured (as described by Carleton et al., 1982) either with dial calipers or an ocular micrometer. These were: greatest length of skull (GSL), length of rostrum (LR), length of nasal bones (LN), postpalatal length (PPL), zygomatic breadth (ZB), breadth of braincase (BB), mastoid breadth (MB), least interorbital width (LLW), length of molar toothrow (LMR), length of incisive foramen (LIF), length of auditory bullae (LAB), depth of braincase (DDB), length of braincase (DB), length of mesopterygoid fossa (LMF), length of bony palate (LBP), breadth of rostrum (RB), greatest breadth across molars (BAM), postdental palatal breadth (PDB), and width of mesopterygoid fossa (WMF).

Specimens were grouped into 12 locality samples (Fig. 1), based on geographic proximity and similarity of habitat and elevation, for purposes of statistical evaluation of population variation. Sample 1 from Pericos, Sinaloa, was included as a reference sample of *P. boylii rowleyi* to assess the degree of morphological distinction between that taxon and *P. simulus*. Samples 4 ($n = 21$) and 8 ($n = 39$) of *P. simulus*, which contained the largest number of adult individuals, were used to assess the extent of variation in external and cranial measurements among the three adult age classes in that species. ANOVA and Duncan's multiple range tests of the Statistical Analysis System (SAS, 1985) were used to determine if significant variation existed among age classes or between sexes. A three-level nested analysis (Varcomp option of SAS, 1985) was used to estimate the variance components of morphological characters attributed to differences: 1) among localities; 2) between sexes within localities; 3) among age classes within sexes within localities; 4) interactions of localities, sex and age; and 5) residual or error variation. The residual effects represent random factors, such as environmental and seasonal influences, which cannot be attributed to locality, sex or age variation alone. ANOVA and Duncan's multiple range test were used to evaluate geographic variation among individual characters.

Several multivariate statistical procedures from the Numerical Taxonomy Program (NT_SYS) of Rohlf and Kispauigh (1972) were used to evaluate the relationships of samples in multivariate character space. The first three principal components were calculated from the character correlation matrix of standardized means and projected in a three-dimensional diagram to visually assess the morphological relationship among samples. A minimum spanning tree analysis was superimposed on the principal components analysis to depict the shortest path connecting all samples in