

SHORT NOTES

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**THE NUMBER OF
CERVICAL VERTEBRAE
IN LACERTID LIZARDS:
SOME UNUSUAL CASES**

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The presence, shape and size of the ribs associated with the vertebrae have constituted the most important criteria in delimiting different presacral subregions within the vertebral column of reptiles. Nevertheless, in lizards, the strong morphological variations that occur in the ribs along the first presacral vertebrae have led to the use of different criteria when defining the cervical region (see Estes, de Queiroz & Gauthier, 1988, for a discussion of this subject). Using the most common definition according to which the cervical region includes all vertebrae preceding that bearing the first rib joined to the sternum, most lizards have typically eight cervical vertebrae (Hoffstetter & Gasc, 1969). Until now, this number has been considered unvariable for a number of squamate taxa among which the lacertids are included (Hoffstetter & Gasc, 1969; Barbadillo, 1989). However, here we report two cases of lacertid lizards whose respective cervical regions, according to the definition given above, consist of only seven vertebrae. One of the specimens is a cleared and stained subadult female of *Psammotromus algirus* referred to as UAMPS038 and housed at the Unidad de Paleontología of the Universidad Autónoma de Madrid (Fig. 1). The other one corresponds to a cleared and stained adult female of *Lacerta vivipara* housed at the same collection and referred to as UAMLV057. As is the most common pattern observed in lacertids, the fourth, fifth and sixth vertebrae of both specimens bear short, relatively broad, free ribs whose size progressively increases in the caudal direction. Each of these ribs has associated distal, forked cartilages. A pair of long, free ribs with distal, single cartilages is connected to the seventh vertebra. However, the eighth vertebra bears a pair of long, thin ribs joined via cartilaginous elements to the sternum; in this way, the thoracic (=sternal) subregion extends in this specimen from the eighth to the twelfth vertebra. This means a general 'forward displacement' of the thoracic subregion with respect to the usual pattern seen in lacertids in which the thoracic subregion begins at the ninth vertebra (Hoffstetter & Gasc, 1969; Barbadillo, 1989). Although UAMPS038 and UAMLV057 represent less than the 3% of the whole

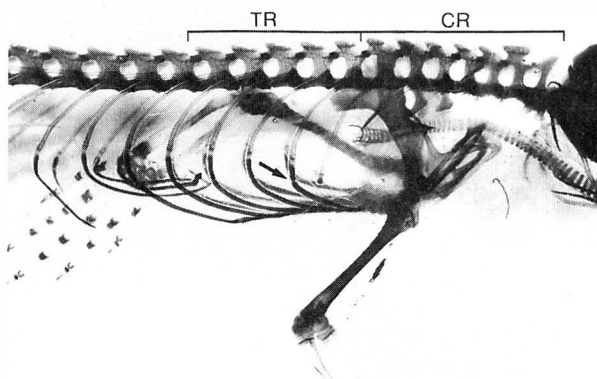


FIG. 1. Lateral view of the specimen UAMPS038 described in the text. CR: Cervical subregion; TR: Thoracic subregion. The arrow indicates the first rib joined to the sternum (see text for explanation).

sample examined for both species (*L. vivipara*: $n = 32$; *P. algirus*: $n = 36$), the interest of these kinds of phenotypic variants should not be underestimated. In lizards, similar individual deviations from the common cervical formula have been described for some geckonids and scincids (Hoffstetter & Gasc, 1969). On the other hand, in lacertids, considerable individual variability has been recorded for many other osteological traits (Barbadillo, 1989). There is clearly a need to quantify the extent of these individual variations before assigning character states to species. Moreover, a detailed study of the morphological variants shown by a given phenotypic trait, even if they represent true teratologies, can be useful in order to interpret the nature of some morphogenetic processes (Alberch, 1980).

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