

Shell morphometrics of three species of gadilid Scaphopoda (Mollusca) from the Southwestern Atlantic Ocean: comparing the discriminating power of primary and secondary descriptors

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Abstract

Shell morphometric data are potentially useful in discriminating among morphologically similar mollusc species. Only a few studies, however, have assessed the value of this method for identifying and delimiting scaphopod taxa. We attempted to discriminate three southwestern-Atlantic species of gadilid scaphopods, *Gadila acus* (Dall, 1889), *Cadulus braziliensis* Henderson, 1920, and *Polyschides tetraschistus* (Watson, 1879) using Discriminant Function Analysis of shell morphometric data. We tested the efficiency of three morphometric indices proposed by Shimek (1989), nine direct shell measurements proposed by Steiner & Linse (2000), and three newly proposed morphometric indices. Shimek's (1989) indices correctly assigned 133 of 150 specimens (88.67%), whereas the direct shell measurements data correctly assigned 149 specimens (99.34%). The most efficient set of parameters assigning all specimens correctly consisted of: 1) the height of the posterior aperture, 2) the total length of the shell, 3) the maximum arc, 4) the ratio of total shell length and the distance from the dorsal aperture to the point of maximum width, 5) the ratio of the maximum shell diameter and the apertural diameter, and 6) the ratio of the height and width of the posterior aperture. Because this combination of variables was 100% efficient in discriminating among the three species, we recommend its use as the best tool for separating these slender gadilid scaphopods.

Key words: Scaphopoda, Gadiliidae, Siphonodentaliidae, morphometrics, shell measurements, southwestern Atlantic Ocean

Introduction

Analysis of shell morphometrics is a commonly used taxonomic tool in assessing local or regional conchological variations in molluscs (Kilgour *et al.* 1990; Rolán 1991; Johannes-