PALAIOS, 2011, v. 26, p. 433–446
Research Article
DOI: 10.2110/palo.2010.p10-145r

Fidelity of molluscan assemblages from the Touro Passo Formation (Pleistocene–Holocene), southern Brazil: Taphonomy as a tool for discovering natural baselines for freshwater communities

Fernando Erthal,[1] Carla B. Kotzian,[2]* and Marcello G. Simões[3]

[1]Programa de Pós-Graduação em Geociências, Instituto de Geociências, Universidade Federal do Rio Grande do Sul, CEP 91.501-970, Porto Alegre, Rio Grande do Sul, Brazil; [2]Departamento de Biologia, Universidade Federal de Santa Maria, CEP 97.105-970, Santa Maria, Rio Grande do Sul, Brazil; [3]Instituto de Biociências, Universidade Estadual Paulista, Distrito de Rubião Junior, C.P. 510, 18.610-000, Botucatu, São Paulo, Brazil
e-mail: modrizralok@hotmail.com
**Corresponding author.*

Keywords: fluvial setting, preservational potential, rank abundance, living assemblage, death assemblage, conservation biology, alien species invasion

ABSTRACT

This study is the first assessment of mollusk fossil assemblages relative to the compositional fidelity of modern mollusk living and death assemblages. It also shows that the sedimentary record can provide information on the original, non-human-impacted, freshwater malacofauna biodiversity, based on Late Pleistocene shells. The fossil mollusk assemblage from the Touro Passo Formation (Pleistocene–Holocene) was compared to living and death assemblages of the Touro Passo River, southern Brazil, revealing little resemblance between fossil and live-dead species composition. Although the living and death assemblages agree closely in richness, species composition, and species relative abundances (both proportional and rank), the fossil assemblage differs significantly from both modern assemblages in most of these measures. The fossil assemblage is dominated by the native endemic corbiculid bivalve *Cyanocyclas limosa* and the gastropod *Heleobia* aff. *bertoniana*. These are absent in the living assemblages, and both living and death assemblages are dominated by the alien Asiatic corbiculid *C. fluminea*, which is absent in the fossil assemblage. The fossil assemblage also contains, overall, a higher proportional abundance of relatively thick-shelled species, suggesting a genuine bias against the thinner- and smaller-shelled species. Our results suggest that contemporary environmental changes, such as the introduction of some alien freshwater mollusk species, together with post-burial taphonomic processes, are the main factors leading to the poor fidelity of the fossil assemblage studied. Hence, the taxonomic composition of the Late Pleistocene mollusks from the Touro Passo Formation probably would show greater similarity to present-day assemblages wherever the mollusk biodiversity is not disturbed by human activities.