A new sediment-dwelling pholadid bivalve from Oligocene glaciomarine sediments of King George Island, West Antarctica

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We present a re-description of the pholadid bivalve from the Oligocene Polonez Cove Formation, King George Island, West Antarctica, previously identified as Penitella sp. The study is based on a collection of 210 specimens, preserved exclusively in life position in flask-shaped Gastrochaenolites type borings which have been subsequently buried by glaciomarine diamictite. The systematic study showed that this pholadid is a new species belonging to the genus Pholadidea rather than to Penitella and we name it Pholadidea gradzinskii sp. nov. The species is one of very few Late Cretaceous–Paleogene pholadids that we could safely identify as Pholadidea. All of them are known exclusively from the southern Pacific and adjacent areas (New Zealand, Antarctica, and Patagonia). We demonstrate that the genus attained its Recent broad distribution before the middle Miocene, when the first species of Pholadidea appeared in the Northern Hemisphere. The mass occurrence of P. gradzinskii in the Oligocene of West Antarctica results from favourable living condition in a shallow marine environment. Low sedimentation rate allowed the settlement of numerous larvae and their subsequent metamorphosis, growth, and maturity terminated by the mass mortality caused by the burial by marine diamictite. The sediment-boring Paleogene species of Pholadidea, among them P. gradzinskii, follow the wood-boring Late Cretaceous species P. (Hatasia) wiffenae, which reflects a general pattern of evolution of substrate selection among pholadoid bivalves.

Key words: Bivalvia, Pholadoidea, Pholadidea, ecology, glaciomarine, palaeobiogeography, Oligocene, Antarctica.

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