

PERMIAN MEGADESMIDS (BIVALVIA, ANOMALODESMATA) AS PALEOZOIC CANDIDATES TO BE CHEMOSYMBIOTIC BIVALVES

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Morphologic, taphonomic, sedimentologic and tectonic data suggest that the bizarre megadesmids *Anhemia froesi* and *Tambaquyra camargoi*, Passa Dois Group (Serra Alta and Corumbataí Formations), Late Paleozoic, Paraná Basin, Brazil, are Permian candidates to be included in roll of chemosymbiotic bivalves. Although proving such assertion is fraught with difficulties, several lines of evidences seams to support this idea: (A) they are found as parautochthonous or autochthonous elements in a thick succession of massive siltstone or mudstones deposited near or below to storm wave base, under variable conditions of oxygen content, in an offshore environment; (B) the shell form similarities (homoplasy) between *Anhemia froesi* and *Arconaia lanceolata*, a pleistocenic chemosymbiotic bivalve; (C) the presence of a well defined rostrum in *Anhemia froesi* shells; (D) the fact they were infaunal bivalves; (E) their restrict horizontal and vertical distributions; (F) *Anhemia froesi* and *Tambaquyra camargoi* are giant bivalves (chemosymbionts utilize stable food resource), particularly if compared with other elements of the Permian sequence of Paraná Basin, and (G) the clastic dikes interpreted as syn-tectonic structures, that are conspicuous features in the Serra Alta and Corumbataí Formations. These could allow the escape of hydrocarbons at the bottom. In this scenario, methane source could be related to the betuminous shales of Irati Formation, that are immediately subjacent to Serra Alta and Corumbataí sediments. Our data support the idea that chemosymbiosis has arisen several times amongst different bivalve groups, and that taphonomic, sedimentologic and tectonic data, complementary among themselves, should be used to gather the paleoecological information.