

Macro- and micromorphology of the scales of a new macrosemiiform from the Aptian West Gondwana

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The neopterygians from La Cantera Formation (Late Aptian, San Luis, Argentina) have been assigned to the so-called order Pholidophoriformes since 1969. Such assignment was done based on the size of the specimens and the presence of ganoid scales, a common approach in identifying “pholidophoriforms”. However, it is well known that ganoid scales are a generalized feature found in many actinopterygians and that the size is not a reliable character. Our studies based on the morphology of the Argentinian fishes suggest that they are not “pholidophoriforms”, but a new macrosemiiform that probably represent the first record for South America. *Placidichthys* from the Lower Cretaceous of Brazil, that was described as a ionoscopiform has been recently interpreted as a macrosemiiform in a phylogenetic analysis. Until this hypothesis is not confirmed we interpret *Placidichthys* as a questionable neopterygian. Our goals here are to describe the macro- and micromorphology of the squamation of the new macrosemiiform specimens, which is incompletely known among members of this group. Thus, detailed observations on the surface and structure of the scales has been done mostly in complete and also disarticulated specimens. Scales from different regions of the flanks were prepared for histological studies, and were observed under petrographic microscope using polarizing light. The surface of some scales were observed under SEM.

The new macrosemiiform possesses ganoid scales covering the whole body flanks. Some mid-flank scales placed posterior to the dorsal fin are covered by minuscule and irregularly distributed tubercles, which are observed only under SEM. Most of the scales are rhombic, with smooth surface and smooth posterior margin, and with well-developed peg and socket articulation; however, as it has been described in others macrosemiiforms, rounded ganoid scales are present in the pre-pelvic region, close to the ventral margin. The scales are arranged in about eight horizontal rows along the flank, with about 38 lateral line scales. Their shapes vary along the body, being large, rectangular, higher than broad, up to the preanal region and becoming smaller and rhomboidal posteriorly. Consequently, the number of horizontal rows increases caudally. Large, slightly oval or rounded scutes, covered with unornamented ganoin, are preceding the pelvic, dorsal and anal fins. Elongate and oval scutes precede the dorsal and ventral margins of the caudal fin. The histological slides reveal that the scales are of the lepisosteid type, with multiple ganoin layers, canaliculi of Williamson, and Sharpey's fibers. The scales lack dentine.

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