

SOFT PARTS PRESERVATION IN EMBRYOS OF THE ACTINOPTERYGIAN *SAURICHTHYS*, FROM THE MIDDLE TRIASSIC OF MONTE SAN GIORGIO, SWITZERLAND

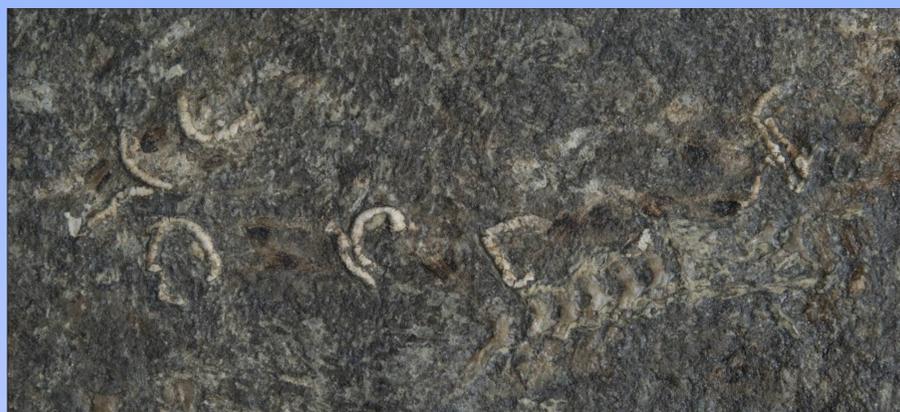
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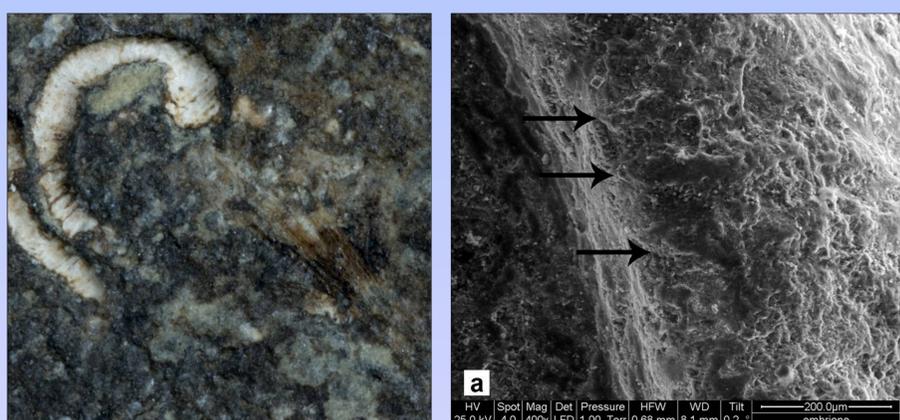
²Museo Cantonale di Storia Naturale, via Cattaneo 4, CH-6900 Lugano, Switzerland.



Saurichthys curionii, specimen MCSN 8016



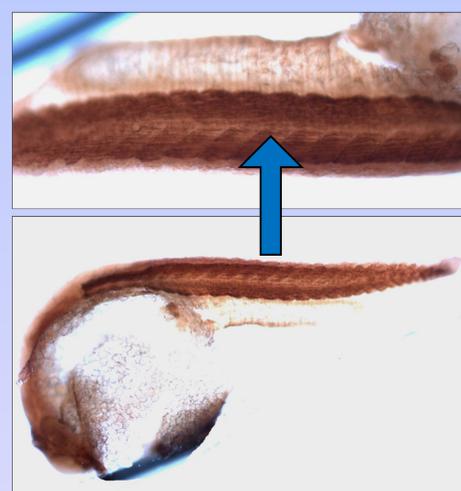
Close-up of the body region with embryos preserved



Left, high magnification detail of an embryo, with somites; right, SEM photograph of a portion of the embryo revealing the metameric structure (arrows).

New excavations in the famous Monte San Giorgio area, close to the Cassina beds outcrops (Lower Meride Limestone, Early Ladinian), have been undertaken in 2006 by the Museo Cantonale di Storia Naturale (Lugano). Along with sauropterygian fragmentary remains and smaller fishes, the new excavations yielded many complete and well preserved specimens of the large (up to 0.5 m standard length) predatory actinopterygian fish *Saurichthys*.

In one of the prepared specimens (MCSN 8016), sixteen very small embryos (skull mean length 6 mm) are present, which show a peculiarity not reported so far for other *Saurichthys* embryos: each skull is associated with a tiny, narrow and elongate structure which, at higher magnifications, appears as a short and narrow cylinder, either curled or comma shaped. The nearly one-to-one association between the embryonic skulls and the narrow cylinders suggests that they represent some postcranial structure of the embryos. Chemical investigation (Renesto & Stockar, 2009) revealed the phosphatic nature of these structures. Phosphatization may occur for soft parts if the microenvironmental conditions around the carcass are modified by bacterial activity.



Embryo of the extant zebrafish (*Danio rerio*), in lateral (left) view, processed with antimyosin antibody to show the somites.; with a close up of a portion of the body to show somites (courtesy of Gianluca Tettamanti, Dipartimento di Biotecnologie e Scienze Molecolari, Università dell'Insubria).

The size and length of these structures with respect to the associated skulls are compatible with the axial musculature (Renesto & Stockar 2009) and recalls the morphology of embryos of extant fishes, so that the curled narrow cylinders may represent the fossilized musculature of the embryos, with each segment corresponding to a somite.

This discovery is of particular relevance because fossil embryos with preserved soft parts are extremely rare. In addition, although viviparity had previously been described for *Saurichthys*, the new specimens yield better evidence and add further support to this reproductive mode.

References: Renesto S. & Stockar R. 2009: Exceptional preservation of embryos in the actinopterygian *Saurichthys*, from the Middle Triassic of Monte San Giorgio, Switzerland. *Swiss Journal of Geosciences* 102, in press.