

TIMELESS DESIGN: COLORED PATTERN OF SKIN IN EARLY PERMIAN BRANCHIOSAURIDS (TEMNOSPONDYLI: DISSOROPHOIDEA)

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The color of recent animals and plants is important in many respects. Sometimes it is used for camouflage or to attract attention. One of the most useful features of color is to give reconstructions of extinct creatures a “living touch.” This is particularly the case for three-dimensional reconstructions of fossil animals for the purpose of popularization of earth history. Colored patterns are rarely preserved in fossils. Sometimes the shells of bivalves, brachiopods, or snails represent remains of a pattern with dark and bright colors. But in only a few exceptions is the true color known.

In fossil vertebrates, the preservation of skin or other soft parts is relatively common. Remains of colored pattern are extremely rare. In amphibians, some of these structures are partly known from fossil frogs, but a colored skin pattern has not been reported previously in an extinct amphibian.

MATERIAL AND TAPHONOMY

One large skeleton of the branchiosaurid *Melanerpeton tenerum* (NHMS-WP 3444a, b) with a colored skin pattern has been found in lacustrine laminites of the Börtewitz Formation from Börtewitz in the NW Saxony Basin (Germany). The skeleton is preserved in ventral view with the underlying colored dorsal skin on one slab (Figs. 1, 2A). The counterpart presents the partial skeleton in dorsal view showing the uncolored ventral skin (Fig. 2B). The sediments are fine grained and included a few pyroclastic components.

Hundreds of branchiosaurid specimens are known from the vertebrate Lagerstaette Börtewitz, but only one is preserved with colored skin pattern. A general condition for this exceptional preservation is the fine grained sediment, which was influenced thermally by a nearby magmatic body. Similar conditions are discussed for a rare fossil record of the lateral line system in branchiosaurids (Werneburg, 2005). Another reason may be the rarity of skin preservation in very large skeletons. All other recorded branchiosaurid specimens from the Börtewitz Lake are smaller in size or not so well preserved.

DESCRIPTION

Species—The skeleton, illustrated in Figures 1–3, clearly belongs to *Melanerpeton tenerum*, which was described by Schönfeld (1911), Boy (1986), and Werneburg (1988, 1989). It has a skull length of approximately 30 mm with a very elongate maxilla. It represented a large growing species (skull length from 7 mm to approximately 40 mm) in contrast to the smaller two branchiosaurids from the Börtewitz Lake (see later). At this last stage of ontogenetic development, the shape of the skull roof is characteristically triangular with a pointed snout. The elongated squamosal and interclavicle as well as the relatively short humerus are diagnostic features of *M. tenerum* in comparison with related species of *Melanerpeton*.

Skin Pattern—The skin preservation of this specimen shows a regular pattern. There is the appearance of a mosaic of bright spots that have a blurred boundary of dark pigments with an

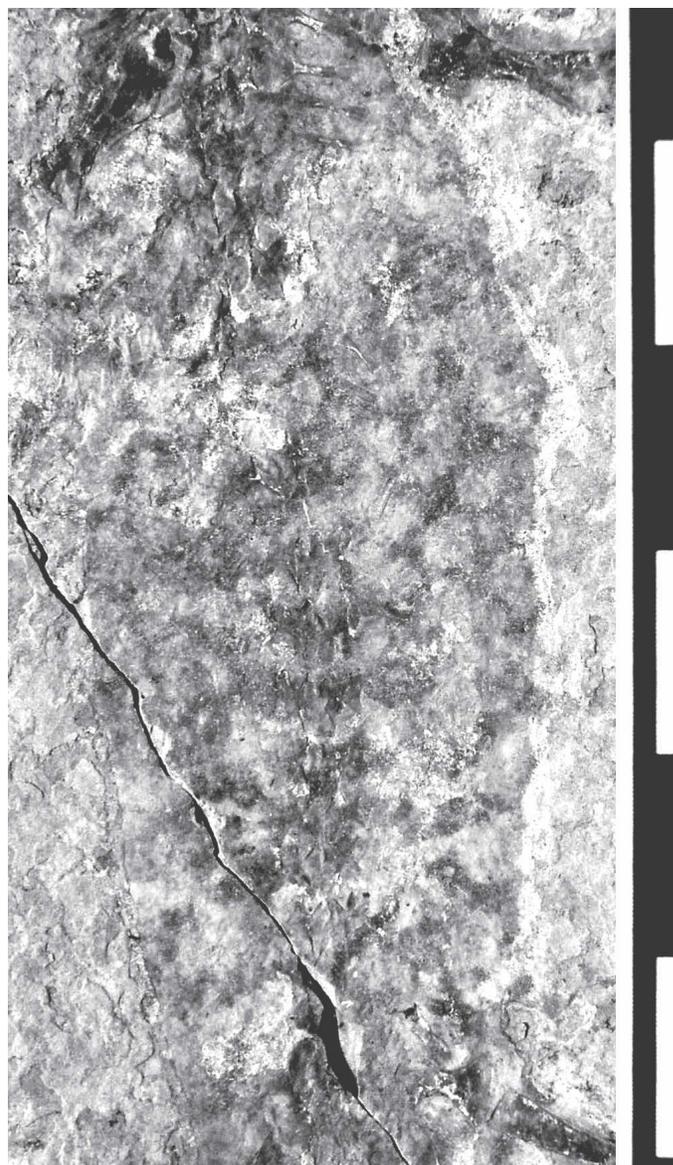


FIGURE 1. Spotted pattern of skin colour in the thoracic region of the branchiosaurid amphibian *Melanerpeton tenerum* from the Lower Permian of Germany, NHMS-WP 3444a.