



# Cranial anatomy of the aetosaur *Paratypothorax andressorum* LONG & BALLEW, 1985, from the Upper Triassic of Germany and its bearing on aetosaur phylogeny

Rainer R. Schoch and Julia B. Desojo

With 8 figures

**Abstract:** The large aetosaur *Paratypothorax andressorum* has so far been known only by its osteoderms. Here we describe for the first time the skull of a complete, articulated specimen of this taxon that was found in the type horizon at Murrhardt, southwestern Germany. *Paratypothorax andressorum* has the following cranial autapomorphies: (1) upper jaw margin with deep notch between premaxilla and maxilla, (2) maxilla-lacrimal suture with finger-like projection, (3) upper temporal fenestra triangular, and (4) first paramedian cervical osteoderms narrow and oval, much smaller than second row. Apart from these features, the skull of *P. andressorum* closely resembles that of the small aetosaur *Aetosaurus ferratus* known from the same horizons, despite major differences in the morphology of osteoderms. Both taxa share (1) the pointed, beak-shaped premaxilla which expands only gently anterior to the nasal, (2) maxilla and lacrimal excluding jugal from margin of antorbital fenestra, (3) exclusion of squamosal from margin of infratemporal fenestra, and (4) posterior part of jugal not downturned. Phylogenetic analysis reveals poorly resolved relationships within Aetosauria, but exclusion of a problematic taxon *Coahomasuchus* results in a much better resolution, with *Paratypothorax* to nest with *Rioarribasuchus*, *Tecovasuchus*, *Typothorax*, and *Redondasuchus* within a monophyletic Typothoracinae. Interestingly, *Aetosaurus* and *Stenomyti* form successive sister taxa of this clade rather than fall within an aetosaurine grade of basal aetosaurs, as suggested by previous authors. The resemblance of *Paratypothorax* and *Aetosaurus* in many cranial features, their close relationship as suggested by the present analysis, and the immature state of all available *Aetosaurus* specimens suggest two new alternative hypotheses: (1) *Aetosaurus* is the juvenile of a close relative of *Paratypothorax* or (2) it is itself the juvenile of *Paratypothorax*.

**Key words:** *Aetosaurus*, Archosauria, Löwenstein Formation, Norian, Pseudosuchia.

## 1. Introduction

Aetosaurs form a distinctive clade of quadrupedal archosaurs, which was first recognized on the basis of a spectacular find from Germany. This encompassed 24 articulated skeletons of the name-bearing genus *Aetosaurus*. They were recovered on a single block in a small quarry at the village of Kaltental, now a suburb of

Stuttgart (FRAAS 1877). These heavily armoured pseudosuchians were soon reported from other Upper Triassic deposits in Europe and North America, and among the first finds were large osteoderms from a locality very close to the original *Aetosaurus* site, at Heschl in Stuttgart. In fact, some of these isolated osteoderms were reported before the discovery of *Aetosaurus* itself and initially referred to another archosauriform: