

**A NEW LEPIDOSAUR (REPTILIA)
FROM THE NORIAN BEDS OF THE BERGAMO PREALPS
(PRELIMINARY NOTE)**

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Key-words: Lepidosauria (Reptilia), Norian (Upper Triassic), Lombardy (N. Italy), New Genus, Description.

Abstract. In this preliminary note is described a new norian reptile, *Endennasaurus acutirostris*, found in the Zorzino Limestone, in the small quarry of Endenna, near Zogno in the Bergamo Prealps (Lombardy, N. Italy). The specimen, belonging to a new genus and species, is exposed on ventral side, so that nothing can be said about the skull roof pattern. Nevertheless other characters such as the pattern of the pelvic and shoulder girdle, and of the tarsus allow us to consider this specimen as a Lepidosaur and to put it among the *Eosuchia* sensu Peyer & Kuhn-Schnyder (1955) awaiting a further more complete study to define better the taxonomic position of *Endennasaurus acutirostris*.

Riassunto. In questa nota preliminare viene descritto un nuovo taxon di Rettile fossile: *Endennasaurus acutirostris* (gen. n., sp. n.) rinvenuto nella località di Endenna, vicino a Zogno (BG), nelle Prealpi Bergamasche. Il fossile è stato trovato nel Calcare di Zorzino, membro superiore della Dolomia Principale, attribuito al Norico medio-superiore (Triassico Superiore).

L'esemplare è esposto in norma ventrale e quindi non è possibile esaminare il tetto cranico; tuttavia gli altri caratteri a nostra disposizione permettono di considerare *E. acutirostris* (gen. n., sp. n.) un Lepidosauro e di attribuirlo temporaneamente agli *Eosuchia* sensu Peyer & Kuhn-Schnyder (1955) in attesa di uno studio più completo per meglio definire la posizione sistematica di questo nuovo genere.

Introduction.

Among the rich vertebrate fauna collected from the Zorzino Limestone, reptiles undoubtedly constitute an important part which scientific interest has already been established.

On the land made up by the large carbonate platform (Tintori, 1980) lived flying reptiles, placodonts, phytosaurs and lepidosaurians, often belonging to new taxa. *Endennasaurus* was one of them; it was probably a terrestrial or semi-aquatic organism, as suggested by the structure of the limbs and caudal vertebrae; in addition the long and pointed shape of the jaws and the long neck may indicate a diet based on small sea organisms.

The collected specimen is not complete: it lacks of almost all the right rear limb and only five caudal vertebrae are preserved.

It is difficult to establish the taxonomic affinities of this reptile, both for the kind of exposition (on ventral side) and for the different kind of characters at our disposal.

Owing to the preservation of the fossil, exposed on ventral side, nothing can be said about the pattern of the skull. Nevertheless some other features allow us to define the taxonomic position of *Endennasaurus acutirostris*.

The pattern of the tarsus and of the pelvic and shoulder girdle are those of a lepidosaur. The shape of the ilium is very similar to the one of *Askeptosaurus* (Kuhn, 1952); the ischium presents a posterior process like the one of *Macrocnemus* (Peyer, 1937) and the cervical vertebrae are similar to those of *Prolacerta* as shown by Peyer in Piveteau (1955); additional lepidosaurian features are the shape of the quadrate and the mesotarsal joint of the foot; on the other hand the caudal vertebrae are similar to those of *Pachypleurosaurus* as shown in Zangerl (1935).

Endennasaurus shows some primitive characters, as for the weakly hooked fifth metatarsal, while others are also present in some modern lepidosaurs (Carroll, 1977) and in Prolacertilians (Wild, 1980).

In this paper, that is only a preliminary note, I consider *Endennasaurus acutirostris* as belonging to the order *Eosuchia*, following the classification by Peyer & Kuhn—Schnyder in Piveteau (1955, see also Kuhn—Schnyder, 1980), awaiting a further more complete study to define better the taxonomic position of this new genus.

Measurements.

On the fossil had been taken these measurements: the length of the entire preserved part of the specimen, mm 464; the length of the skull, mm 84; and the length of these bones: 8° cervical vertebra, mm 17; 3° caudal vertebra, mm 11; humerus, mm 50, radius mm 27; ulna mm 27; femur mm 58; tibia mm 31; fibula, mm 31.

Palaeontological description

Class REPTILIA

Subclass LEPIDOSAURIA

Order Eosuchia

Family *incertae sedis*

Genus *Endennasaurus* gen. n.

Type—species: *Endennasaurus acutirostris* sp. n.

Diagnosis. As there is only one species in this genus, the diagnosis for the genus is included in the one of the species.

Endennasaurus acutirostris gen. n., sp. n.

Pl. 11, 12; Text—fig. 1—3

Derivatio nominis. Endenna, from the locality where the fossil was collected.

Locus typicus. Endenna quarry, near Zogno (Bergamo, Lombardy, N. Italy).

Stratum typicum. Upper part of the Zorzino limestone, Upper Triassic (Norian).

Holotype. The only known specimen, signed as ET 38 (5170 of the catalogue of the Bergamo Museum of Natural Sciences).

Repository. Bergamo Museum of Natural Sciences.

Diagnosis. Skull narrow and elongate. Palatine bones without teeth. Amphicoelus vertebrate; neural spines stout (specially in the caudal region) and pectinated; cervical vertebrae somewhat longer than trunk ones. Well developed gastralia. Shoulder girdle made up by paired clavicles, scapulae and coracoids with a single T shaped interclavicle. Humerus enlarged at its distal end, with stout ventral process near its proximal head; entepicondilar foramen present. Pelvic girdle with fenestra thyroidea; ilium posteriorly elongate; ischium with median posterior process. Fifth metatarsal weakly hooked and intruding in the row of distal tarsals. Phalangeal pattern of the foot: 2, 3, 4, 5, 4.

Description. The specimen, although lacking of right posterior limb and of almost all the tail, is generally well preserved. It is exposed on ventral side. The neck is broken at the level of the sixth cervical vertebra and sharply bent to the right side, so that the first six cervical vertebrae are visible from the ventral side while the remaining are exposed on lateral view, as for all other vertebrae.

The right side of the shoulder girdle is better preserved than the left one, along with the interclavicle.

Gastralia cover almost all the trunk.

The left part of the pelvic girdle is better preserved than the right one; on the other hand only the upper half of the left femur is preserved while the right posterior limb is quite well preserved.

Skull. The skull is exposed ventrally so that nothing can be said about skull roof pattern and snout region. It presents a very elongated shape, with a pointed snout. The skull is transversally broken by a fracture in the region of the basisphenoid; in addition the portion of the skull anterior to the fracture had been shifted posteriorly below the other part for about half a centimeter length; so the whole length of the skull has to be increased with this part.

A little rounded basioccipital is present, from which start two well developed exoccipitals. The basisphenoid is seen with its posterior part, while

the narrow anterior process is almost completely covered by shifted palatine bones.

Palatine and vomers are partially covered by lower jaw bones, so that their true shape is not well recognized, it is possible to notice however that they are long and bear no teeth.

Quadrate is not well visible: it seems to be subtriangular in shape and possess a stout longitudinal medial ridge.

The pterygoids are long and narrow and ectopterygoids are well developed and rather stout. As can be observed at the other palatine bones no teeth are present.

The lower jaw is very long and stout. The articular is very thin at its posterior end; its width increases anteriorly rather quickly; the prearticular and the splenial are both long and narrow; the dental is very long and tapers gradually to the anterior tip of the jaw. The two branches of the jaws form a very sharp angle, so that the shape of the mouth region resembles a beak.

Vertebral column. Vertebrae are amphicoelous. 12 cervical vertebrae are present, followed by almost 15 trunk vertebrae (their exact number is not available because most of them are covered by gastralia, so that their number was estimated by the periodical rising of the gastralia in correspondence of the transverse process of the vertebrae).

Only five caudal vertebrae are preserved, with some fragments of the neural spines of three others and so the true number of these remains unknown.

The body of the cervical vertebrae seems to be not longer than that one of the dorsal vertebrae. Prae and postzygoapophyses are stout and long more than that ones of the dorsal vertebrae. The neural spines of cervical vertebrae decrease in height anteriorly.

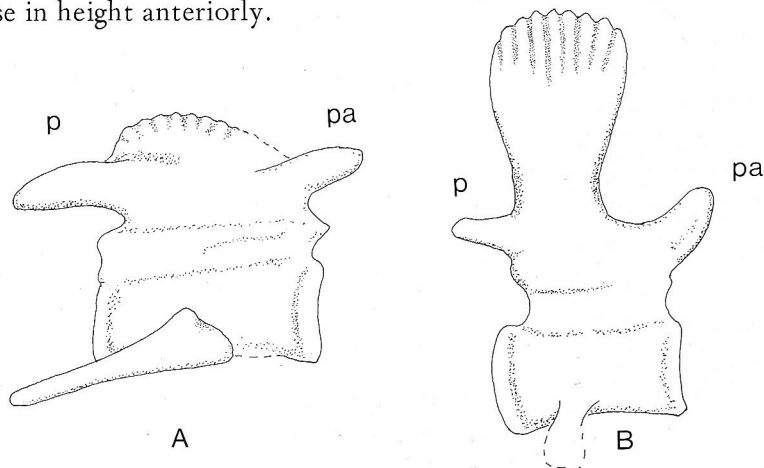


Fig. 1 — *Endennasaurus acutirostris* gen. n., sp. n.

A) Cervical vertebra; B) caudal vertebra. Pa = praezygoapophyses; P = postzygoapophyses.

Only two dorsal vertebrae are partially visible: the centrum is stout and praezygoapophyses are weakly directed upward.

Caudal vertebrae are massive and with a high neural canal that bears a stout neural spine at its upper border covered by parallel grooves; these spines reduce their width and increase their height posteriorly; praezygoapophyses are weakly directed upwards, postzygoapophyses are thin and straight.

On the caudal vertebrae it is possible to notice that between neural arches and centra a thin suture line is detectable.

The caudal vertebrae resemble in shape the ones of *Pachypleurosaurus* (Zangerl) as illustrated in Zangerl (1935).

Ribs. The cervical ribs are two headed and rather stout at their proximal end while they are decreasing posteriorly rather quickly.

Little can be said about thoracic ribs because they are almost completely covered by gastralia, some characters of the first two ribs however are detectable: they are stout and sharply bent, the maximum angle of bending lies near the articulation with the vertebral column.

Rests of the first two caudal ribs can be seen but only one is well preserved. It shows a weakly convex directed articulating surface, then diminishes in size and cross-section increasing in width and finally becoming more flat toward the distal end.

Gastralia. There are present 31 gastralia; they are thin and flat in their proximal region, becoming more cylindrical in cross-section at their distal end, in this region the gastralia have the maximum angle of bending.

Shoulder girdle. It consists of paired clavicles, coracoids and scapulae and of a single medial interclavicle.

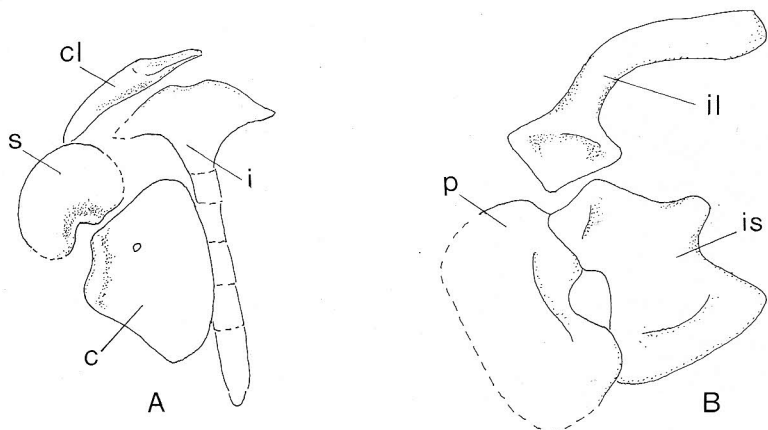


Fig. 2 — *Endennasaurus acutirostris* gen. n., sp. n.

A) Right half of the shoulder girdle, in ventral view; B) left half of pelvic girdle, in ventral view. s = scapula; cl = clavicle; c = coracoid; i = interclavicle; il = ilium; is = ischium; p = pubis.

Scapula and coracoid have rounded margins and are platelike; both become thickened in the glenoid region.

The coracoid is larger than the scapula and a coracoid foramen is present near the glenoid region.

The clavicles are thin and elbowed; the interclavicle is typical T – shaped with an expanded anterior margin and a very long medial backwards directed process.

Anterior limb. The humerus is stout; it is enlarged at its distal end, on the ventral side, near its proximal head there is a well developed vertical directed process; entepicondilar foramen is detectable; the posterior outline of the bone is more concave than the anterior one.

Radius and ulna are almost of similar size. The distal end of the radius is enlarged and the margin shows a rather straight outline, while the ulna does not show enlargements; its distal end is quite convex.

Ulnare and intermedium are well to be recognized in the series of four distal carpals; five long and stout metacarpals are visible: the phalanges of the digits are stout, ending in a claw. Phalangeal number can be given only for the first four fingers: 2,3; 4,4.

Pelvic girdle. It consists of a large and approximately rectangular pubis, a well developed ischium and an elongated ilium.

The ischium bears a posterior process directed backwards, which lies at the posterior margin, almost in its middle; the bone increases its width towards its lower border.

Between ischium and pubis a well developed fenestra thyroidea is present.

The ilium is stout and bears a long posteriorly directed process which fits with the vertebral column; the shape of the bone is very similar to that of *Askeptosaurus*.

Posterior limb. The femur is long, weakly sigmoidal bent. Near its proximal head a large trochanter is present. The surface for the articulation with the pelvis is weakly convex.

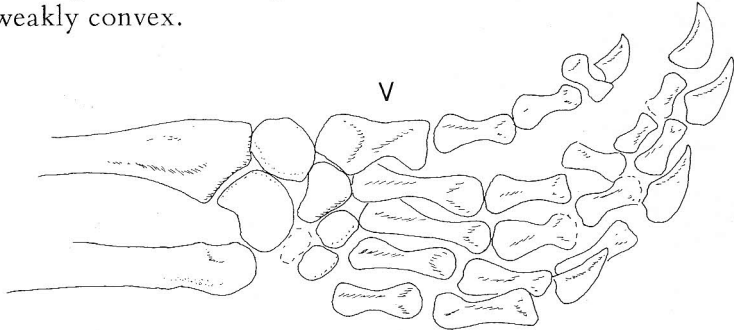


Fig. 3 – *Endennasaurus acutirostris* gen. n., sp. n.

Right foot in ventral view. V = fifth metatarsal.

Tibia and fibula are both stout bones, they are longer than radius and ulna; the fibula is enlarged at its distal end for the articulation with the astragalum and partly with the calcaneum.

At least three distal tarsals are present, the most distal one is the largest.

The five metatarsals are well to be seen, the first is short and thick, the fifth is weakly hooked. Its posterior border is attached firmly to the last distal tarsal.

The digits of the toes are stout and end in a claw. The phalangeal pattern of the foot is 2, 3, 4, 5, 4.

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The fossil is stored in the Museo di Scienze Naturali «E. Caffi» of Bergamo, director M. Guerra.

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PLATE 11

Fig. 1 — *Endennasaurus acutirostris* gen. n., sp. n. Holotype. Scale line equal to 4 cm.

Fig. 2 — *Endennasaurus acutirostris* gen. n., sp. n. Holotype. Skull, ventral view; scale line equal to 2 cm.



PLATE 12

Fig. 1 — *Endennasaurus acutirostris* gen. n., sp. n. Holotype. Shoulder girdle, ventral view.

Fig. 2 — *Endennasaurus acutirostris* gen. n., sp. n. Holotype. Pelvic girdle, ventral view.

Scale line equal to 2 cm.

