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MEGALANCOSAURUS PREONENSIS N.G., N.SP., A NEW REPTILE FROM THE NORIAN OF FRIULI, ITALY

MEGALANCOSAURUS PREONENSIS *N.G., N. SP., UN NUOVO RETTILE DAL NORIANO DEL FRIULI*

Abstract - A new Triassic reptile, **Megalancosaurus preonensis** n. g., n. sp., is reported from the Norian dolostones and dolomitic bituminous limestones of the Preone valley (Ampezzo, Province of Udine, Italy). Following an introduction concerning stratigraphy and paleoecology, the incomplete preserved skeleton is described. Some features of the fore-limbs, in particular the morphology of the manus, suggest an arboreal mode of life of the reptile.

Key words: Reptilia, Upper Trias, Friuli, Systematics.

Riassunto breve - *Si segnala il ritrovamento di un nuovo rettile triassico,* **Megalancosaurus preonensis** *n. g., n. sp., proveniente dalle dolomie e calcari dolomitici bituminosi della valle di Preone (Ampezzo, Provincia di Udine, Italia). Dopo una breve introduzione stratigrafica e paleoecologica, viene descritto lo scheletro incompleto del nuovo rettile. Alcune caratteristiche dell'arto anteriore ed in particolare la struttura della zampa, suggeriscono un adattamento alla vita arboricola.*

Parole chiave: *Rettili, Triassico Superiore, Friuli, Sistematica.*

1. Introduction

During the spring of 1980 Mr. Sergio Spizzamiglio, an enthusiastic amateur paleontologist, made an interesting find at a fossiliferous locality of the Preone valley, near Ampezzo Carnico, Udine. He descovered an uncompleted preserved skeleton of a reptile in a Norian outcrop.

material and scarcely fossiliferous with few remains of Lamellibranchia. This scarcety of microfauna depends on the particular paleoecological conditions of the basin and the accentuated diagenetic events.

The macrofossil situation is somewhat different; BRAGA (1966) reported finds of fish belonging to the Pholidophoridae family in dolomitic and bituminous limestones near Rio dei Laz to the South of Ampezzo Carnico. Apart from this, other discovering regarding Decapoda and fishes have been made by amateur collectors and these findings are at the present time under study. The whole fauna and paleoenviromental conditions of the Dolomia di Forni could lead to interesting comparisons with other formations of the same period, as, for example, the Calcare di Zorzino (see CASATI, 1964, 1968; ZAMBELLI, 1973, 1975).

This sediments were deposited in a lagoon with few terrigenous contributions, limited by the platform deposits of the Dolomia Principale. Life was able to prosper in the shallow water and near the margin of the basin, while this was rather difficult at the bottom, due to the presence of heuxinic conditions and to the restricted water circulation. The discovery of a terrestrial vertebrate in a lagoonal basin with indisturbed sedimentation indicates the presence of a land, perhaps in the form of islands, not far from where it was deposited.

3. Description

3.1. Skull and lower jaw (figs. 2, 3 and 4)

The crushing of the bone and the preservation of the skeleton in the small and large slab makes it very difficult to define the skull elements particularly with regard to the temporal region. At the present time it has not been possible to complete the preparation of the skull because this could cause irreparable damage and the loss of some bones. However further preparation will give a better definition of some features of the skull which at present creat some perplexity.

A great part of the skull bones is preserved in the smaller slab, were the skull appears on the left hand side. Only the temporal region is preserved in the larger slab. The outline of the skull is subtriangular. The premaxilla ends in its

anterior part with a characteristic pointed «beak». The temporal region is considerably enlarged and similar to that in pterosaurs. The premaxilla surrounds a large nasal opening of semielliptical form. This opening is enveloped dorsally by the nasal. Laterally the maxilla separates the naris from the antorbital opening, which is of trapezoidal shape and smaller than the naris. The large subcircular orbita is enclosed anteriorly by the ?prefrontal and a ?lacrimal. There seem to be no sclerotic plates, but this may be due to the preservation. The jugal is triradiate and surrounds the lower part of the orbita and posteriorly the lower temporal arch. The temporal region is baldy preserved. There are 2 temporal openings. The upper temporal opening is clearly recognizable, while the lower one, probably of greater size, is covered by other bones. Other skull bones are difficult to determinate.

The lower jaw seems to be in almost natural contact with the skull. There is a characteristic bending of each part of the jaw in its posterior half. Between the upper and lower jaw a rod like bone can be recognized which is determinated as the ceratobranchial I.

3.2. Dentition (fig. 4)

In the right lower jaw 19 teeth are recognizable, whilst in the left part we can count 22 teeth on the larger slab and only 16 in the smaller one. The right upper jaw possesses the better preserved part of the dentition. By combination of the small and larger slab one can see in the premaxilla 4 teeth. After a «diastem-like» zone without teeth, 20-22 teeth follow in the maxilla. In the left upper jaw, which is badly preserved, 16 teeth are recognizable. The total number of theeth in each branch of the lower jaw is estimated to be 25 and 30.

The tooth implantation is thecodont or prothecodont, this is evident by the presence of numerous alveola. They are easily distinguishable, even if the jaws are badly crushed, owing to the fact that the bone is split.

No palatal teeth have been observed. All teeth are of a small size, sharp pointed and conical. The isodont dentition may be interpreted as serving for an insectivorous diet.

3.3. Left fore-limb (fig. 5)

The fore-limb of the new reptile is one of the best preserved parts of the skeleton. It is of a remarkable size, compared to the length of the skull and neck. The humerus, completely preserved in the larger slab, lacks its distal end in the smaller slab. Its length is 22 mm, the greatest width is 3.2 mm and the smallest 1.6 mm. The ulna, broken near its distal end, measures 15.2 mm in length. The radius is the stouter bone of the lower arm. Its distal end seems to be partially covered by some carpals. The length of the radius is 15.6 mm. There are 3 or 4 carpalia. The 5 digits have the phalanx formula 2-2-3-3-3, which is rather unusual in reptiles.

The first digit is partially covered by the lower jaw and its second phalanx is elongated. The same observation can also be made at the second digit whilst the third digit seems to have shorter and thinner phalanges than the first two. All digits end with large claws of almost similar size and form. Their distal ends are pointed and bent downwards. The presence of those «hook-claws», as we know them from pterosaurus and birds with respect to the long lower arm, leads us to assume the reptile as having had arboreal habits. This consideration may be supported by the structure of the hand. It is possible that the first 3 digits might have served as a unit and were opponible to the 4. and 5. digit, in a similar way as in chamaleons for grasping: 3 digits (the first 3) grip anteriorly, 2 (4. and 5. digit) grip posteriorly. That may explain why the distal end of the ulna is broken because of the fact that the 4. and 5. digits were bent by compression in the horizontal plain, in which the 3 other digits are laying. Therefore also the carpus is disarticulated in the ulnar region, but not in the radial part.

The measurements of the digits are in tab. I.

	1° Digit	2° Digit	3° Digit	4° Digit	5° Digit
1° Phalanx	1.6 ?	3.0	2.9	3.0	2.0
2° Phalanx	5.8	5.7	6.1	2.9	2.9
3° Phalanx	—	—		4.0	4.2
Claw		3.1 ?	4.0	4.3	3.7

3.4. Other skeletal elements (figs. 2 and 3)

The cervical part of the vertebral column is almost completely preserved, apart from the atlas, which cannot be seen in the crushed occiput region of the skull. There is a short axis and 5 following elongated neck vertebrae. It is almost impossible to describe the type of the vertebra, owing to the almost sagittal splitting of the block. The third vertebra measures 6.9 mm, the fourth 8.4 mm, and the fifth 9.5 mm in length.

The pelvic girdle is uncomplete and not clear in detail. The acetabulum is clearly visible. It is recognizable as a hole, that has also been caused by the splitting. The pubis is elongated, rod-like and thinner than the ischium. The ilium possesses a pointed posterior process. Its outline is approximately triangular and resembles the ilium of the thecodonts.

Near the pelvic girdle lay fragments of other bones, probably belonging to the hind-limbs, perhaps to the femur. There are also ribs and fragments of the shoulder girdle, with and uncompletely preserved but recognizable coracoid.

4. Conclusions

The most important features of the new Triassic reptile are the large fore-limbs with the unusual phalanx formula 2-2-3-3-3, which is unknown in any other Triassic reptile. The first 3 digits seems to be opponible to the other 2 digits. Those features, the elongated lower arm and the «hook-claws» indicate an arboreal mode of life. The diapsid skull shows a peculiar feature in the «beak-like» process of the premaxilla. There is a preorbital opening. The neurocranium seems to be enlarged as in pterosaurus and birds. The pelvic girdle is not «open»

Tab. I – Measurements of phalanges and claws of the left fore-limb (in mm). The 2. and 3. phalanx of 3. digit are measured together. The claw of 1. digit is covered by the lower jaw.
– *Misure delle falangi e degli artigli dell'arto anteriore sinistro (in mm). La 2° e 3° falange del terzo dito sono state misurate assieme. L'artiglio del 1° dito è coperto dalla mandibola.*

as in dinosaurs. It shows an approach between ischium and pubis. The latter is elongated. The cervical vertebrae are elongated.

These features, some of them unique among Triassic reptiles, justify the erection of a new genus of the reptilia. Without doubt it must be classified within the Thecodontia, but its definitive systematic position remains uncertain until a detailed comparative study, mainly of the skull, is carried out. The importance of the new reptile is based on its arboreal habits, which are of considerable interest in relation to the thecodontian origin of birds.

5. Systematic description

Class	*Reptilia* LAURENTI, 1768
Subclass	*Archosauria* COPE, 1869
Order	*Thecondontia* OWEN, 1859
Suborder	*? Pseudosuchia* ZITTEL, 1887-1890
Family	*Incertae sedis*
Genus	**Megalancosaurus** n. g.

Derivatio nominis: From Greek, megas = great, large; ancon = arm and saurus = saurian. Based on the long arm.

Type species: **Megalancosaurus preonensis** n.g., n.sp.

Diagnosis: Reptile of small size, with triangular diapsid skull and a large semielliptical naris; premaxilla with a «beak-like» tip of the snout; trapezoidal preorbital opening; large subcircular orbital; small upper and probably larger lower temporal opening; jugal triradiate; about 30 teeth in each part of the upper and 25 teeth in the lower jaw; dentition thecodont or prothecodont; teeth small, sharp pointed and isodont; fore-limbs of remarkable size, lower arm elongated; hand with 3 or ? 4 carpalia and 5 digits with the phalanx formula 2-2-3-3-3; claws hooked, large and sharp pointed; first 3 digits probably opponible to the other 2; 6 cervical vertebrae, 4 of them elongated; pubis rod-like, elongated and approached to the ischium.

Megalancosaurus preonensis n.g., n.sp.

Derivatio nominis: From Preone valley, Province of Udine, Italy, where the fossil was found.

Holotypus: GP/1769 MFSN (Museo Friulano di Storia Naturale - Udine, Italy).

Stratum typicum: «Dolomia di Forni» - Norian.

Locus typicus: Near Casolare Torzulis in Preone valley - Ampezzo, Friuli, Italy.

Diagnosis of the species: See diagnosis of the genus.

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Fig. 2 – **Megalancosaurus preonensis** n. g., n. sp., Norian, Preone valley; Nr. GP/1769 MFSN. The speciemen in the small slab.
– *L'esemplare nella lastra piccola.*

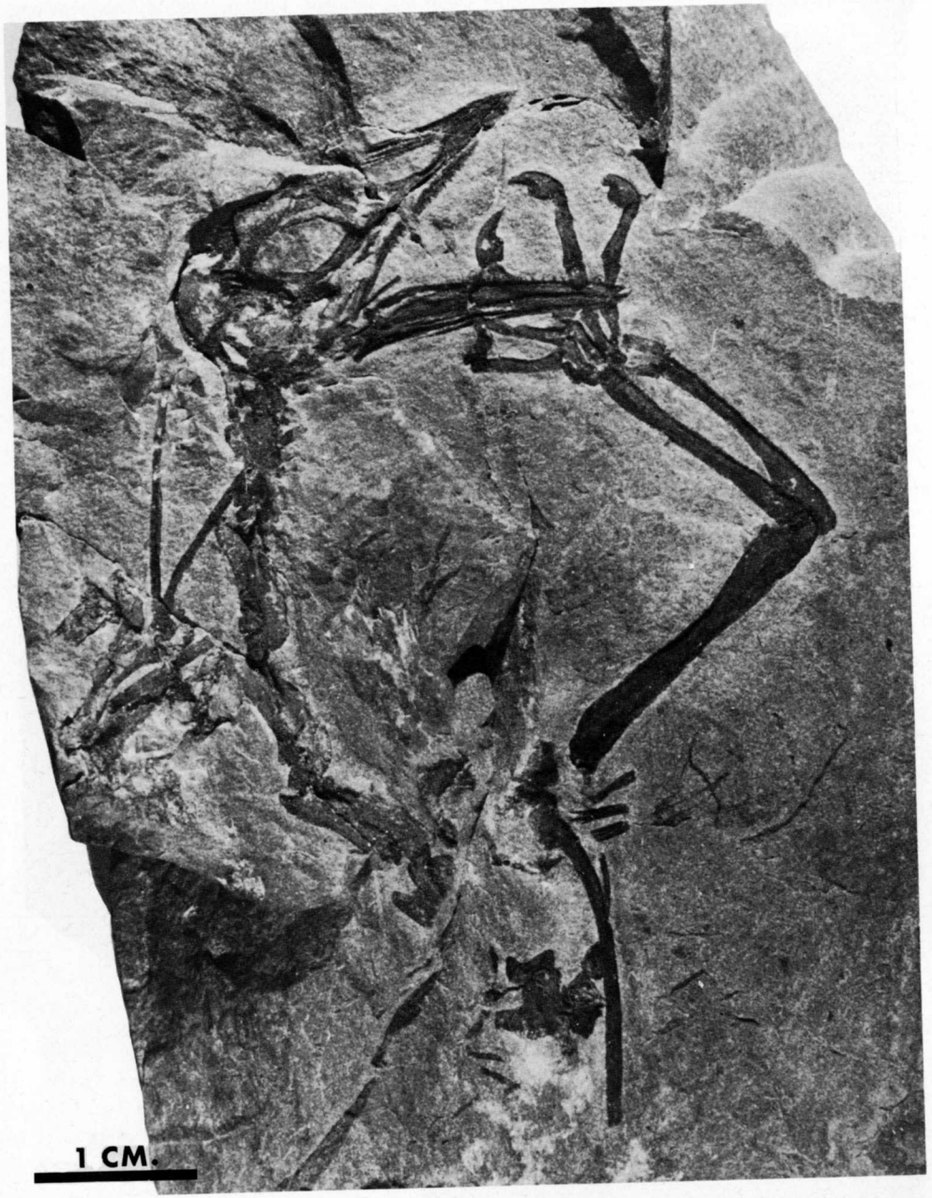

Fig. 3 – **Megalancosaurus preonensis** n. g., n. sp., Norian, Preone valley; Nr. GP/1769 MFSN. The speciemen in the large slab.
– *L'esemplare nella lastra grande.*

Fig. 4 – **Megalancosaurus preonensis** n. g., n. sp., Norian, Preone valley; Nr. GP/1769 MFSN. Skull.
– *Il cranio.*

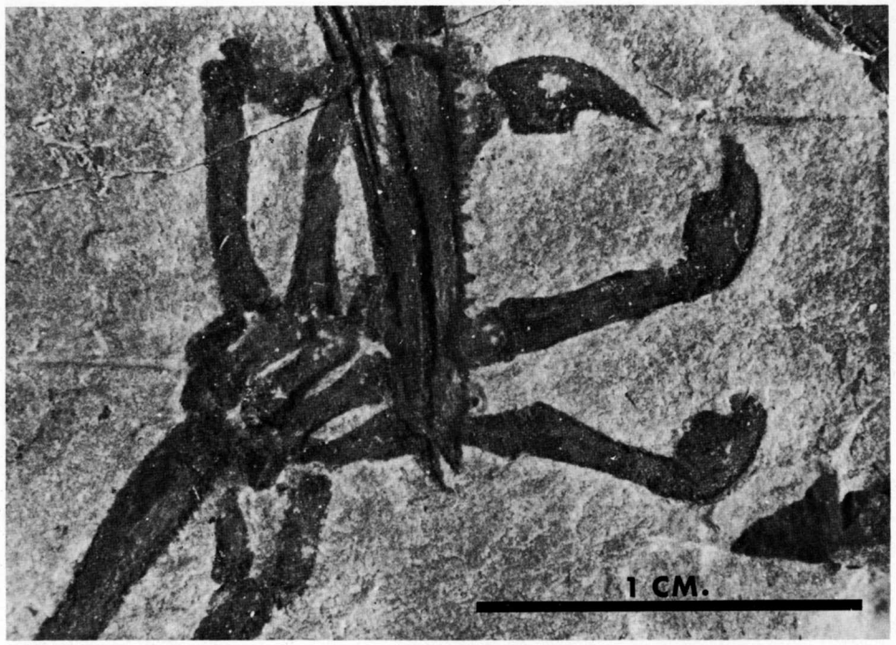

Fig. 5 – **Megalancosaurus preonensis** n. g., n. sp., Norian, Preone valley; Nr. GP/1769 MFSN. Left manus.
– *Particolare dell'arto anteriore sinistro.*

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