

The lizard *Rubiessaurus* Gómez Pallerola, 1979 from the Lower Cretaceous of Catalonia (Montsec, Lleida, Spain)

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RESUMEN

EVANS, S.E. y BARBADILLO, L.J. El lagarto *Rubiessaurus lapicidinarum* del Cretácico inferior de Catalunya (Montsec, Lleida, España).

En el presente trabajo se efectua una revisión y una redescipción de *Rubiessaurus lapicidinarum*, un lagarto del Cretácico Inferior de Santa María de Meià, Montsec. El espécimen, descrito en su día como restos pertenecientes al cráneo y a un miembro anterior (Gómez Pallerola, 1979), incluye en realidad partes de los miembros posteriores y de la cintura pelviana. No puede ser distinguido de *Meyasaurus faurai*, originalmente descrito del Montsec (Vidal, 1915) y, posteriormente, de diversas localidades en las provincias de Cuenca (Uña, Las Hoyas) y Teruel (Galve).

Palabras clave: Lagarto, Squamata, Barremiense, Cretácico, Montsec, Cataluña, España.

ABSTRACT

The lizard *Rubiessaurus lapicidinarum* (Gómez Pallerola, 1979) from the Lower Cretaceous deposits of Santa María del Meià, Montsec, is reevaluated and redescribed. The specimen, originally described as the remains of the skull and forelimb, comprises parts of the hindlimbs and pelvic girdle. The skeletal parts preserved are indistinguishable from those of the *Meyasaurus faurai*, originally described from Montsec (Vidal, 1915) but subsequently recorded from localities in the province of Cuenca (Uña, Las Hoyas) and Teruel (Galve).

Key words: Lizard, Squamata, Barremian, Cretaceous, Montsec, Catalonia, Spain.

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INTRODUCTION

Lizards were first recorded from the Mesozoic of Spain by Vidal (1915), who recovered and briefly described a single specimen from a quarry at Santa Maria de Meià, Montsec (Catalonia). The horizon, then thought to be of late Jurassic age, is now considered as early Cretaceous (Berriasian-early Valanginian: Brenner *et al.*, 1974; Peybernès and Oertli, 1972). Vidal's specimen, named *Meyasaurus* after the type locality, was redescribed by Hoffstetter (1966) in conjunction with a second lizard specimen from Montsec, *Ilerdaesaurus*. For many years, these two specimens remained the only examples of early lizards from Spain, but more recently sites in the provinces of Cuenca (Las Hoyas, Uña) and Teruel (Galve) have yielded richer assemblages (Barbadillo and Evans, 1995; Evans and Barbadillo, 1996; Richter, 1991, 1994a,b). The Las Hoyas specimens have shown that *Ilerdaesaurus* is a junior synonym of *Meyasaurus* (Evans and Barbadillo, 1996), but also that the lizard assemblage of Montsec, as currently known, is rather depauperate. Four taxa, including *Meyasaurus*, have been recorded from Uña (Richter 1994b), and three, also including *Meyasaurus*, are known from Las Hoyas (Barbadillo & Evans, 1995; Evans & Barbadillo, 1997, *in press* a, b).

A third Montsec lizard specimen (LP-0098 IEI/G) was described by Gómez Pallerola (1979), who placed it in a new genus and species – *Rubiessaurus lapicidinarum* (but *R. lapricidinarum* in the caption to photograph 8). The author interpreted the specimen as consisting of a skull and left forelimb. No comparison was made with the skull of *Ilerdaesaurus* (= *Meyasaurus*), but Gómez Pallerola distinguished his specimen from the Montsec holotype of *Meyasaurus faurai* on the basis of size differences, phalangeal formula (2:3:3/4:3/4:2 as compared to 2:3:4:5:3 in the hand of *Meyasaurus*) and skull shape.

Examination of the specimen, however, raises a serious problem. LP-0098 IEI/G is certainly part of a lizard (foot and vertebral structure), but the specimen preserves elements of the hind limbs and pelvis, with some isolated ribs and vertebrae; there is no trace of either the skull or the fore limb.

THE MATERIAL

The specimen (LP-0098 IEI/G), in the palaeontological collections of the Institut d'Estudis Ilerdencs in Lleida, consists of a single part bearing a right hind limb; fragments of the left hind limb; fragments of the pelvic girdle; sacral and caudal vertebrae; and isolated ribs. The preservation is generally poor, with a mixture of impression and bone fragments, but the general morphology is clear. The long bones of the hindlimb appear to bear incompletely ossified joint surfaces, although the tarsals are fully formed and the astragalus and calcaneum are fused without trace of a suture. This suggests delayed epiphyseal ossification rather than immaturity.

Vertebrae

Little of the vertebral structure remains but it is clear from the fragments that the centra were procoelous. Part of the anterior caudal series is preserved below the left femur, showing strong caudal ribs.

Girdles

Parts of the ilia and ischia from both sides of the body are preserved (Fig.1), with the ischia relatively small by comparison with the ilia.

The hindlimb

A complete right hindlimb is preserved. The femur (11 mm) is strongly built and typically sigmoid in form. The tibia and fibula are shorter (7 mm) and rather more gracile. In all cases, epiphyses are visible but incompletely ossified. The astragalus and calcaneum are coossified into a large proximal astragalocalcaneum, notched distally for the enlarged fourth distal tarsal. A smaller bony mass flanking dt4 is probably the third distal tarsal. Of the metatarsals, three and four are of similar length (4.5mm); the fifth is short and distinctly hooked, with a large proximal head. The phalangeal formula is 2:3:4:5:4 (not 2:3:3/4:3/4:2).



Fig. 1. LP-0098 IEI/G: general plan of the specimen. AC, astragalocalcaneum; F, Fibula; Fe, femur; il, ilium; Is, ischium; Mt5, fifth metatarsal; Pu, pubis; T, tibia; V, vertebrae.

Fig. 1. LP-0098 IEI/G: plan general del ejemplar. AC, astragalocalcaneo; F, fibula; Fe, fémur; il, ilium; Is, ischium; Mt5, quinto metatarsal; Pu, pubis; T, tibia; V, vértebras.

DISCUSSION

The short hooked fifth metatarsal and the shape of the astragalocalcaneum, in combination with vertebrae which were certainly procoelous, indicate that LP-0098 represents part of a lizard skeleton. Neither of the lizard specimens previously described from Montsec includes the hindlimb, but the Montsec lizards have been shown to be related to those from the Barremian locality of Las Hoyas (Cuenca Province) (Barbadillo and Evans, 1995; Evans and Barbadillo, 1997, *in press a,b*), and several of these specimens preserve the limbs (e.g. LH 370). In general, the hindlimb of LP-0098 resembles that of *Meyasaurus* from Las Hoyas in the detailed shape of the fifth metatarsal and astragalocalcaneum, in the phalangeal formula, in the similarity in length between the third and fourth metatarsals, and in the delayed ossification of the joint surfaces –despite the strongly ossified skeleton. Minor differences exist in the relative length of the metatarsals (Mt4 is 41% of femoral length in LP-0098 as compared to 50% in LH 370) and of the fifth digit (92% of femoral length in LP-0098, as against 78% in LH 370, a specimen of similar size but with a proportionally longer femur), but similar differences in proportions exist within modern lizard genera. Between species of *Agama*, for example, Mt4/Femur length values range from 40% to 53%, and Digit 5/Femur length ranges from 53% to 75%. Furthermore, similar differences, in humerus/digit proportions, occur between the Montsec holotype of *Meyasaurus faurai* and the Las Hoyas specimens. Thus manus digit 1 is 63% of humerus length in *M. faurai* but around 33% in the Las Hoyas specimens, a difference that reflects the rather shorter humerus of the Montsec form. MC4 is around 36% of humerus length in *M. faurai*, and around 39% in Las Hoyas LH 307. We do not have

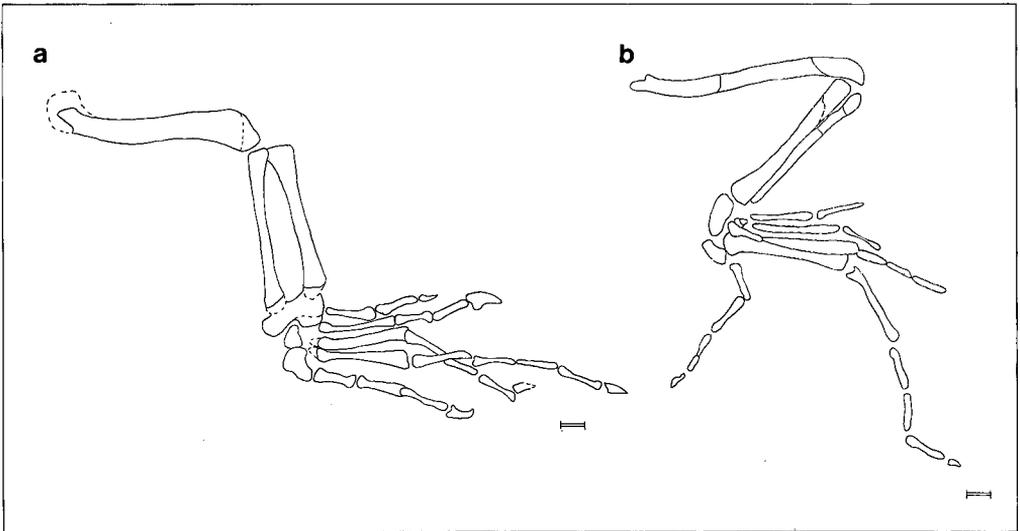


Fig. 2. Comparison of the hind foot of LP-0098 IEI/G (A) with that of *Meyasaurus* (LH 370) (B) from Las Hoyas.

Fig. 2. Comparación de la pata de LP-0098 IEI/G (A) con la de *Meyasaurus* (LH 370) (B) de Las Hoyas.

the hind limb and foot of *M. faurái*, but if the relatively shorter propodial and metapodial of the forelimb is also found in the hindlimb, then the hindlimb of *M. faurái* would be predicted to resemble that of LP-0098.

Uña and Las Hoyas specimens of *Meyasaurus* have been placed in separate species on the basis of tooth numbers (40+ at Uña, 30 at Las Hoyas, Evans & Barbadillo, 1996, 1997, *in press* a, b; Richter, 1994a,b), while the skulls of both are distinguished from that of *Meyasaurus (Ilerdaesaurus) crusafonti* from Montsec in having more narrowly constricted frontals. There is thus evidence from skull morphology that the Montsec material of *Meyasaurus* was specifically distinct from the younger Uña and Las Hoyas material and the postcranial differences described above are compatible with that view.

CONCLUSION

Except in highly specialised taxa, use of a fragmentary hindlimb skeleton as a generic holotype would be difficult to justify. Furthermore, the hindlimb of LP-0098 resembles that of known specimens of *Meyasaurus* in its essentials, and cannot be reliably distinguished from them. LP-0098 adds to the Montsec lizard record, and provides hope that more complete material may yet be found from this locality, but the validity of *Rubiessaurus* Gómez Pallerola, 1979 is not supported and the name should be regarded as a *nomen dubium*.

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