

## **The ontogenetic transformation of the mesosaurid tarsus: a contribution to the origin of the amniotic astragalus**

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Supplementary Files.

The study of a large number of mesosaur specimens from Uruguay and Brazil has provided interesting information about the changes that take places during the ontogeny of the group. One of the most amazing discovering was an almost complete, very small and beautiful preserved specimen, which was interpreted as a non-hatched *Mesosaurus* (Piñeiro et al. 2012), probably close to complete its development, although some indications of its foetal stage are clear: the porous and poorly ossified nature of the bones, the structure of the teeth, including uncomplete and bifurcated elements, the incipient development of the front limbs, particularly the hands, contrasting with the high size of the feet, which preserve what appears to be an astragalus, as the only tarsal element observed. This specimen consists therefore, the only evidence of reproduction in an early amniote and allows us to reconstruct the earliest stages of one of the most complete ontogenetic transition known for a basal component of the group. The purported sutured astragalus is formed by three visible bones (intermedium, tibiale and c3), but indeed it may have been an earlier fusion of the tibiale to c4 as shown by the condition in ancestral tetrapods (Holmes, 1984; Carroll, 1970). Below, we present additional photographs of the non-hatched specimen and particularly, of the area of feet location that show the composite structure of the possible foetal astragalus, which could be the strongest evidence in support to the traditional Peabody's (1951) hypothesis about the origin of the amniotic tarsus.



Figure 1. FC-DPV 2504. Non-hatched *Mesosaurus tenuidens*. Arrow indicates the position of the sutured astragalus.

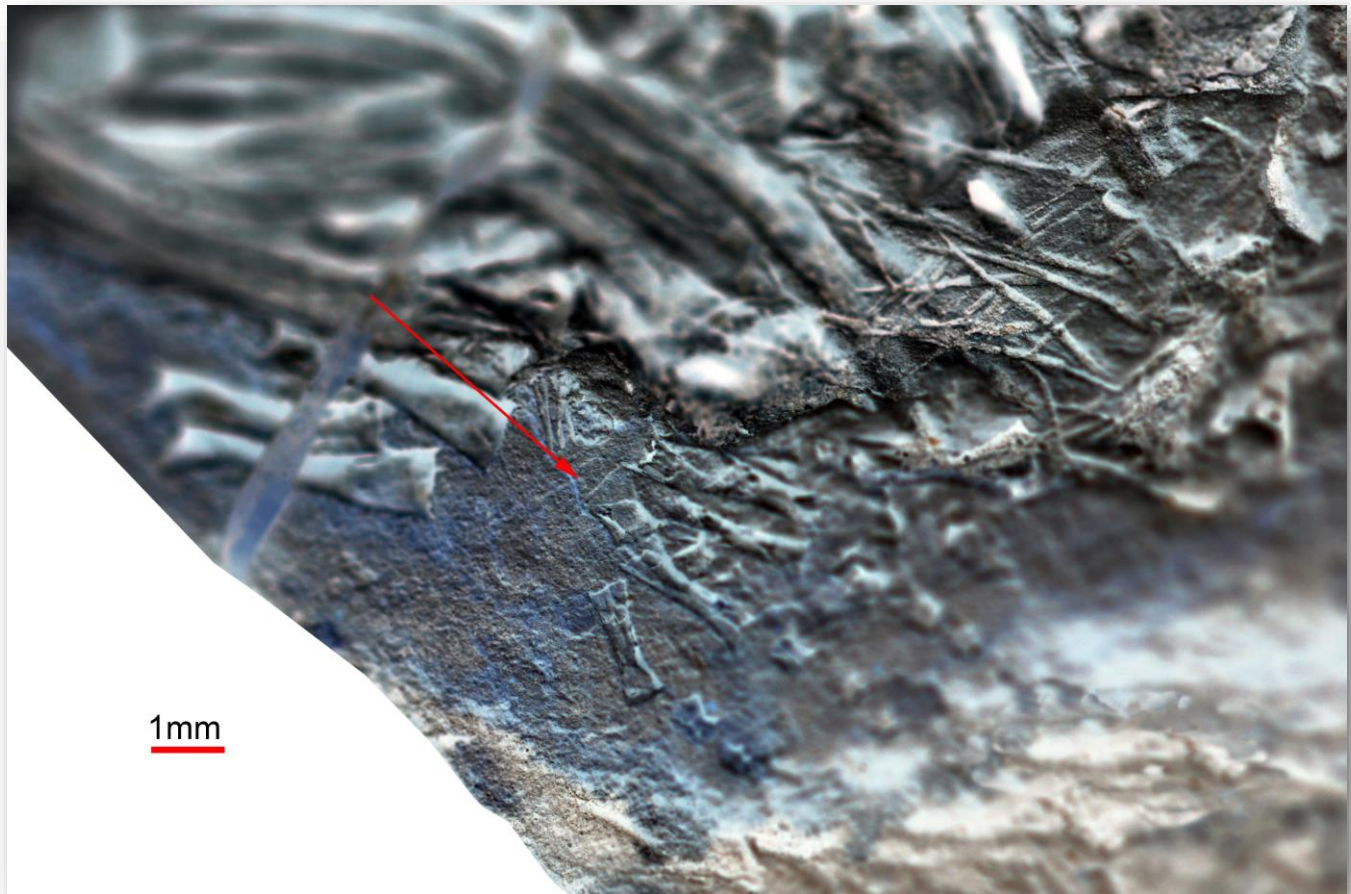


Figure 2. FC-DPV 2504. Non-hatched *Mesosaurus tenuidens*. Close view of the feet area. Arrow indicates the position of the sutured astragalus.





Figure 3. FC-DPV 2504. Non-hatched *Mesosaurus tenuidens*. Close view of the feet area. Arrow indicates the position of the sutured astragalus.

#### References.

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