

Comment (Case 3506) – Support for USNM 4734 being designated as the neotype specimen of *Allosaurus fragilis* Marsh, 1877 (Dinosauria, Theropoda)

(see BZN 67 (1): 53 [Case]; BZN 67 (2): 178; 67 (3): 255; 67 (4): 332; 72 (1): 79; 75: 59–64 [Comments])

Chan-gyu Yun

*Vertebrate Paleontological Institute of Incheon, Incheon 21974,
Republic of Korea / Biological Sciences, Inha University, Incheon 22212,
Republic of Korea
(changyu1015@naver.com)*

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I write in support of the proposal by Paul & Carpenter (2010) to make USNM 4734 the neotype of well-known species of theropod dinosaur *Allosaurus fragilis*. Some authors (Loewen & Chure, 2010; Demirjian, 2010, 2011) have pointed out some erroneous parts of the original proposal by Paul & Carpenter (2010), such as that the original type specimen (YPM 1930) of *Allosaurus fragilis* also includes a fragmentary tooth, incomplete vertebral centrum, two fragmentary dorsal ribs and a fragmentary humerus, which is more than originally noted by Paul & Carpenter (2010). Although it is always good to correct erroneous information, I believe that this has no impact on the status of YPM 1930 as undiagnostic. Below are three reasons why YPM 1930 can only be referred to indeterminate ALLOSAURIDAE.

1. There are currently two valid genera within ALLOSAURIDAE (i.e., *Allosaurus* and *Saurophaganax*), which are all from the Morrison Formation (Hendrickx et al., 2015). No dorsal ribs are currently known in *Saurophaganax* (Chure, 1995, 2000), so it is not comparable with YPM 1930 in this respect. Moreover, no characters from pedal phalanges, tooth, or humerus are suggested to differentiate these two genera (Chure, 1995, 2000). Smith (1998) found that there are no morphometric differences in the humeri of *Allosaurus* and *Saurophaganax*. The preserved vertebral centra in YPM 1930 are incomplete so it is not possible to assign their exact original position within the vertebral series. Therefore, it is impossible to evaluate diagnostic characters in vertebrae of *Allosaurus* suggested by Chure (2000) or *Saurophaganax* suggested by Chure (1995, 2000).
2. Excepting *Allosaurus fragilis*, there are four putative *Allosaurus* nominal species including *A. europaeus* Mateus et al., 2006, *A. lucasi* Dalman, 2014, *A. amplus* Galton et al., 2015 and the nomen nudum *A. "jimmadseni"* (Chure, 2000). Most of the characters differentiating *A. europaeus*, *A. lucasi* and *A. "jimmadseni"* from *A. fragilis* are cranial. Although several postcranial differences are also suggested, they are from parts not preserved in YPM 1930. *Allosaurus amplus* is known from a pes, but no character from III-1 is suggested to be distinct from *A. fragilis* by Galton