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Head and neck posture in sauropod dinosaurs inferred from extant animals

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The neck posture of sauropod dinosaurs has long been controversial. Recent reconstructions position the cervical vertebrae and skull in an "osteological neutral pose" (ONP), the best fit arrived at by articulating the vertebrae with the zygapophyses in maximum contact. This approach in isolation suggests that most or all sauropods held their necks horizontally. However, a substantial literature on extant amniotes (mammals, turtles, squamates, crocodilians and birds) shows that living animals do not habitually maintain their necks in ONP. Instead, the neck is maximally extended and the head is maximally flexed, so that the mid–cervical region is near vertical. Unless sauropods behaved differently from all extant amniote groups, they must have habitually held their necks extended and their heads flexed. The life orientation of the heads of sauropods has been inferred from the inclination of the semi–circular canals. However, extant animals show wide variation in inclination of the "horizontal" semi–circular canal: the orientation of this structure is not tightly constrained and can give only a general idea of the life posture of extinct animals' heads.

Key words: Dinosauria, Sauropoda, extant amniotes, posture, neck, head, semi–circular canals.

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