



Putative Lordosis in a European Pond Turtle (*Emys orbicularis*)

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Anomalies in turtle shells are well documented (e.g., Palis and Kasson 2025; Sonmez et al. 2026). Kyphosis and lordosis are problems related to the vertebral column; kyphosis is the extrusion of the vertebral column (Iverson 2025), whereas lordosis is characterized by the intrusion of the vertebral column (Mitchell 2014). Kyphosis in freshwater turtles has been documented in several species, including *Chrysemys picta* (Moldowan et al. 2015), *Graptemys versa* (Franklin 2021), *Actinemys pallida* (Valdez-Villavicencio et al. 2024), and *Nilssonina hurum* (Mohalik et al. 2025), whereas lordosis has been reported less frequently (e.g., Selman 2019; Valdeón et al. 2020). We herein describe an instance of putative lordosis in a European Pond Turtle (*Emys orbicularis*).

On 17 March 2026 during a herpetological monitoring study, a juvenile European Pond Turtle observed while basking on a log in Las Medulas, Leon Province, Spain (42.45920, -6.77714), exhibited an anomalous carapace shape resembling lordosis (Fig. 1). A concave deformity was

evident in the middle of the shell, although at least aquatic locomotion appeared not to have been affected as the juvenile successfully swam away after being disturbed.

Carapacial anomalies such as supernumerary scutes (Ayres-Fernández and Cordero-Rivera 2004; Kosik et al. 2013) are quite common in European Pond Turtles but kyphosis and lordosis are rarely reported (Valdeón et al. 2020). Causes are unknown, but several hypotheses have been advanced to elucidate the etiology of shell abnormalities, with the majority of such cases associated with complications that occur during embryonic or early juvenile phases of development (e.g., Zimm et al. 2017; Langer et al. 2020) and attributed to factors including improper incubation conditions (e.g., excessively low or high temperatures and insufficient relative humidity) (Cordero et al. 2023). However, environmental pollutants also have been implicated as possible contributing factors (Mendoçal et al. 2016; Cortés-Gómez et al. 2018). Further studies will be necessary to determine whether the presence of shell anomalies in European Pond Turtle populations are indicative of a broader pattern and whether they are attributable to environmental or developmental causes.

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Figure 1. Juvenile European Pond Turtle (*Emys orbicularis*) with an abnormal carapace shape resembling lordosis. Photograph by Cesar Ayres.

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