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Comparative Analysis of Evidence Supporting Hypotheses Regarding Evolutionary Benefit of Neural Spine Sails of Extinct Species

Introduction: This synthesis study investigated the presence of information on neural spine sailed dinosaurs in the current literature, as well as the neural spine sail's (NSS) functional significance based on this literature. NSS are characterized by an enlarged structure that extends from the back of the organisms and is made up of vertebral tissues. There are many proposed functions in the literature, both substantiated and unsubstantiated.

Methods: A thorough literature review was conducted to find any gaps within current literature and identify unsubstantiated hypotheses. A small pool of experts were also consulted to identify any possible gaps in the literature accessed.

Results: After proper assessment of the literature, five theories were found that either dominated the literature or had strong backing. These five included thermoregulation, sexual selection, species recognition, maneuverability, and large-size body adaptations.

Conclusion: After assessment of the literature, five theories were presented as the most likely uses of NSS based on what is known today. This was supported by conversations with experts and by the literature currently available.

Societal Impact: The completion of this literature review provides a framework for future investigations into the NSS structures and their ecological and evolutionary advantages.