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Why is sexual size dimorphism restricted to a single lineage of post-Triassic nautiloids?

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Sexual size dimorphism (SSD) in the post-Triassic nautiloids is a poorly known phenomenon. The first report of SSD was of *Paracenoceras calloviense* from the Middle Jurassic of France by Tintant [1]. Later, three species from the Middle to Upper Jurassic succession of Kutch, Gujarat, India were reported to have similar dimorphism. They are *P. calloviense*, *P. jumarensis* and *P. hexagonum* [2, 3]. I report here two more species with SSD from the contemporaneous deposits of Kutch – *P. cf. lorioli* and *P. waageni* n. sp. The microconch and the macroconch of all the five species differ primarily in size.

It is interesting to note that all the dimorphic nautiloids belong to the genus *Paracenoceras*. In spite of detailed systematic studies done subsequently by Tintant on many nautiloid lineages from different parts of the world after his first report of SSD in 1969 and my observations on several Mesozoic and Cenozoic lineages from Kutch, India no report of SSD emerged from any lineage other than *Paracenoceras*. Here, I explore possible reasons for the evolution of SSD in *Paracenoceras*, and in course, its restriction only to this lineage.

A functional analysis of several shell features, especially shape, indicates that *Paracenoceras* spp. were primarily benthic and lived in shallow shelf setting. On the other hand, most other post-Triassic nautiloids, including the Recent *Nautilus*, either have a relatively deep water abode and/or are nekto planktonic in habit. The benthic habitat of the shelf is more intricately divided in terms of resources and living areas than pelagic habitat. It is argued here that niche separation between the sexes in response to a diversified benthic habitat was the chief driving mechanism in producing SSD in these nautiloids. Niche separation between the sexes of a species in such a habitat increases eco-space utilisation and decreases inter-sexual competition.

References

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