**Table S1 Provenance of fossil material.** Individuals from Yaoying section are usually bigger with a thicker body wall, and have a smaller ratio of apertural width/ shell length than that of specimens from other areas. In the absence of other differentiating features, we consider these deviations as representing ecophenotypical variation within a single species, perhaps reflecting the increased energetics and predation pressure that accompany the shallower water depth reported at the Yaoying section [1].

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| --- | --- | --- |
| NIGPAS specimen numbers | Fossil locality | Coordinates |
| 166593,  166617 | Shankou Village, Anning | N 24º49′53″  E 102º24′47.9″ |
| 166594,  166595 | Yaoying Village, Wuding | N 25º36′01.2″  E 102º20′04.6″ |
| 166596-  166616 | Ma’anshan Village, Chengjiang | N 24º40′37.2″  E 102º58′40.2″ |

**Supplemental References**

1. Zhao, F.C., Hu, S.X., Caron, J.-B., Zhu, M.Y., Yin, Z.J. & Lu, M. (2012). Spatial variation in the diversity and composition of the Lower Cambrian (Series 2, Stage 3) Chengjiang biota, Southwest China. Palaeogeography, Palaeoclimatology, Palaeoecology *346*, 54-65. (doi:[10.1016/j.palaeo.2012.05.021](https://doi.org/10.1016/j.palaeo.2012.05.021))