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# RESOLVING MOLLUSCAN PHYLOGENY: GENOMIC EVIDENCE FOR A SCAPHOPODA–BIVALVIA SISTER RELATIONSHIP

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## Résumé

The phylogenetic positioning of Scaphopoda within Mollusca has been a subject of long-standing debate due to conflicting morphological and molecular data. In this study, we present high-quality chromosome-level genome assemblies for *Pictodentalium vernelei* and *Siphonodentalium dalli*, representing both extant scaphopod orders. Integrating these genomic resources into a comprehensive molluscan phylogenomic framework, our analyses robustly support a sister-group relationship between Scaphopoda and Bivalvia, thereby revitalizing the morphology-based Diasoma hypothesis proposed five decades ago. Molecular clock estimations place the divergence of these lineages at approximately 520 million years ago, offering a temporal framework that reinterprets certain laterally compressed Early Cambrian fossils—such as *Anabarella*, *Watsonella*, and *Mellopegma*—as stem diasomes. Furthermore, the study identifies ancient incomplete lineage sorting (ILS) as a principal factor contributing to previous inconsistencies in scaphopod phylogenetic placement, underscoring the necessity of accounting for ILS in deep phylogenetic reconstructions, especially in the context of rapid radiations like the Cambrian Explosion. These findings not only clarify molluscan evolutionary relationships but also highlight the critical role of rare genomic lineages in resolving complex phylogenetic histories.

**Mots-Clés:** phylogenetic, Scaphopoda, genome, molluscan

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