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An unusual new palaeoscolecidomorph worm from the Cambrian Stage 3 Sirius Passet Lagerstätte in North Greenland

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Palaeoscolecidomorphs are vermiform fossils of debated affinity within Ecdysozoa known from the Cambrian to Silurian. Their body plan includes a spine-bearing introvert, an eversible, toothed pharynx, paired posterior hooks and a slender, annulated trunk usually bearing biomineralized sclerites. While at least superficially scalidophoran-like, they have been assigned to various positions within Ecdysozoa, including to the stem-groups of Panarthropoda and Nematoida. Here, we present a new palaeoscolecidomorph from the Sirius Passet Lagerstätte of North Greenland, *Avannaascolex apalos* gen. et sp. nov. Its morphology is typical of Palaeoscolecida, with a high length-to-width ratio, a small introvert with a small number of spines in each row and terminal paired hooks flanking the anus, but it is unusual in lacking any apparent trunk sclerites. We interpret this as a primary absence based on comparative preservation of other ecdysozoans from Sirius Passet. Introvert spines preserved in relief in *Avannaascolex* provide shape details (e.g., triangular collar spines) that potentially inform on palaeoscolecidomorph affinities. The holotype preserves an unpaired ventral nerve cord, lending support to the presence of an unpaired ventral nerve cord in the ecdysozoan last common ancestor.

Key words: Ecdysozoa, Cycloneuralia, Palaeoscolecidomorpha, Palaeoscolecida, Scalidophora, Cambrian Explosion, Sirius Passet, Greenland.

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