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A new radiodont from the lower Cambrian (Series 2 Stage 3) Chengjiang Lagerstätte, South China informs the evolution of feeding structures in radiodonts

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Radiodonts, a diverse clade of early Palaeozoic stem-group euarthropods, have provided critical information on early euarthropod evolution, and were important constituents of early animal ecosystems. The well-known Chengjiang Lagerstätte (Cambrian Stage 3, *c*. 518 Ma) has yielded the highest known diversity of radiodonts of any Cambrian Konservat-Lagerstätten, and represents a crucial deposit for radiodont research. One important but generally overlooked Chengjiang radiodont taxon, previously identified as *Anomalocaris* sp. or Radiodont C, is herein designated as the type species of a new monotypic genus, *Shucaris ankylosskelos* gen. et sp. nov. based on dozens of specimens. *Shucaris* is distinctive for its combination of several characters, including the strong curvature of frontal appendage, presence of two pairs of endites on proximalmost claw podomere, posteriorly-inward curved endites on proximal five claw podomeres, and most strikingly the coexistence of gnathobase-like structures and oral cone. Phylogenetic analysis retrieves *Shucaris* as either an early diverging member of Anomalocarididae or as sister to the clade Anomalocarididae + Amplectobeluidae. Moreover, our phylogenetic analysis also supports the divergence between hurdiid and non-hurdiid radiodonts. This study not only illuminates the early diversification of Radiodonta, but also provides new insights into the radiodont systematics and phylogeny.