

## Late Cretaceous record of large soft-bodied coleoids based on lower jaw remains from Hokkaido, Japan

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The origin and phylogenetic relationships of most modern coleoid groups have not yet been explained by reliable fossil evidence, in large part because of the reduction or disappearance of a calcified chambered shell during their evolutionary history. Herein we describe two exceptionally large coleoid lower jaws from the Upper Cretaceous strata in Hokkaido, Japan. On the basis of the comparison of gross morphology and morphometric data of the lower jaws of modern and fossil coleoids, we assigned the two lower jaws to the following new taxa: *Nanaimoteuthis hikidai* sp. nov. of the order Vampyromorpha (superorder Octobranchia) and *Haboroteuthis poseidon* gen. et sp. nov. of the order Teuthida (superorder Decabrachia). The lower jaw of *N. hikidai* is distinguished from other species of the same genus from the Upper Cretaceous of Vancouver Island (Canada) and Hokkaido by having a broader, more anteriorly curved hood of the outer lamella. The lower jaw of *H. poseidon* seemingly exhibits mosaic features like those of modern teuthids and sepiids but is assigned to Teuthida on the basis of the overall shape of the outer lamella and the development of a distinct fold on the lateral wall. Because of the unusually large lower jaws, these new taxa appear to be comparable in body size to modern giant squids (*Architeuthis* spp.) and the Humboldt squid (*Dosidicus gigas*). This and other discoveries of large jaws referable to octobranchian and decabrachian coleoids from the Upper Cretaceous strata of the North Pacific fill the gap in the relatively poor fossil record of mainly soft-bodied coleoids.

**Key words:** Cephalopoda, Coleoidea, Vampyromorpha, Teuthida, jaws, Cretaceous, Hokkaido, Japan.

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