

## Late Maastrichtian and earliest Danian scaphitid ammonites from central Europe: Taxonomy, evolution, and extinction

Marcin Machalski

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Late Maastrichtian and earliest Danian scaphitid ammonites from key sections in the Maastricht area in the Netherlands and Belgium, Hemmoor in Germany, Stevns Klint (Sjælland) and Jylland in Denmark, the Lublin Upland in Poland and Lviv in the Ukraine, are studied. In total, thirteen scaphitid taxa are recognised: *Hoploscaphites constrictus lvivensis* subsp. nov., *H. c. crassus*, *H. c. johnjagti* subsp. nov., *H. tenuistriatus*, *H. pungens*, *H. schmidi*, *H. sp. ex gr. pungens-schmidi*, *H. felderi*, *H. sp. ex gr. waagei-angmartussutensis*, *Acanthoscaphites (Euroscaphites) varians varians*, *A. (E.) varians blaszkiewiczi*, *A. (E.?) verneuillianus* and *A. (E.?) sp. aff. verneuillianus*. Sexual dimorphism is demonstrated for several species. Additionally, developmental polymorphism of males is proposed to explain a size-dependent variation of ornament in microconchs of *H. c. crassus*. The extinction pattern of European scaphitids is difficult to assess for methodological reasons. The available data indicate, however, that the *Hoploscaphites constrictus* lineage survived unaffected until the very end of the Cretaceous and even crossed the Cretaceous-Paleogene (K-Pg) boundary. The latest Maastrichtian populations of this lineage, assigned to *H. c. johnjagti* subsp. nov., are dominated by individuals with pronounced ribbing and tuberculation of the body chamber. This may reflect increased predation pressure, indirectly related to the late Maastrichtian regression. The successive members of the *Hoploscaphites constrictus* lineage, i.e., *Hoploscaphites constrictus lvivensis* subsp. nov., *H. c. crassus*, and *H. c. johnjagti* subsp. nov. are useful for subdivision of upper Maastrichtian deposits.

**Key words:** Ammonoidea, Scaphitidae, dimorphism, polymorphism, evolution, extinction, Maastrichtian, Danian, central Europe.

Marcin Machalski [[mach@twarda.pan.pl](mailto:mach@twarda.pan.pl)], Instytut Paleobiologii, Polska Akademia Nauk, ul. Twarda 51/55, PL-00-818 Warszawa, Poland.

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