



# **How to Tell Michelinoceras From Orthoceras**

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## Introduction

Orthoceras is a wastebasket taxon, many orthocerids having been assigned to this genus. *Michelinoceras* is an orthocerid that is very commonly mistaken as Orthoceras, which was restricted by Teichert et al. in 1964 to only one species, *O. regulare*. More recently, a couple more species (*O. bifeovatum*, *O. scabridum*) have been added, but there is nowhere near the number of species as there used to be. *Michelinoceras* itself is another wastebasket taxon, 180 species being assigned to it at the moment; cleaning it up will be a very grueling task <sup>(1)</sup>. Here, I want to settle the differences between *Orthoceras* and *Michelinoceras*, using the description from Sweet (1964), Manda & Kriz (2007), and The Paleobiology Database.

## *Michelinoceras* sp. (Foerste, 1932)

(Fig. 1A)

Rank	Name
Phylum	Mollusca
Class	Cephalopoda
Subclass	Orthoceratoidea
Order	Orthocerida
Family	Orthoceratidae
Genus	Michelinoceras
Species	sp.

(†*Michelinoceras* Foerste 1932 (mollusk). (n.d.).

Long orthocone longicone, held vertically. Ecology nektonic carnivore. Cross section of shell approximately cylindrical. Long camerae and a very long body chamber; well-developed hyposeptal and episeptal deposits. Siphuncle central or slightly sub-central with no deposits. Connecting rings cylindrical. Well-developed hyposeptal and episeptal deposits (Sweet, 1964).

**Range:** Found scattered throughout North America, Europe, and Asia; Some occurrences in South America, Africa, and Australia. Floian of the Ordovician to the Norian of the Triassic (478.6 - 221.5 million years ago). Retrieved from *The Paleobiology Database*.

## **Orthoceras regulare (Schlotheim, 1820)**

(Fig. 1B)

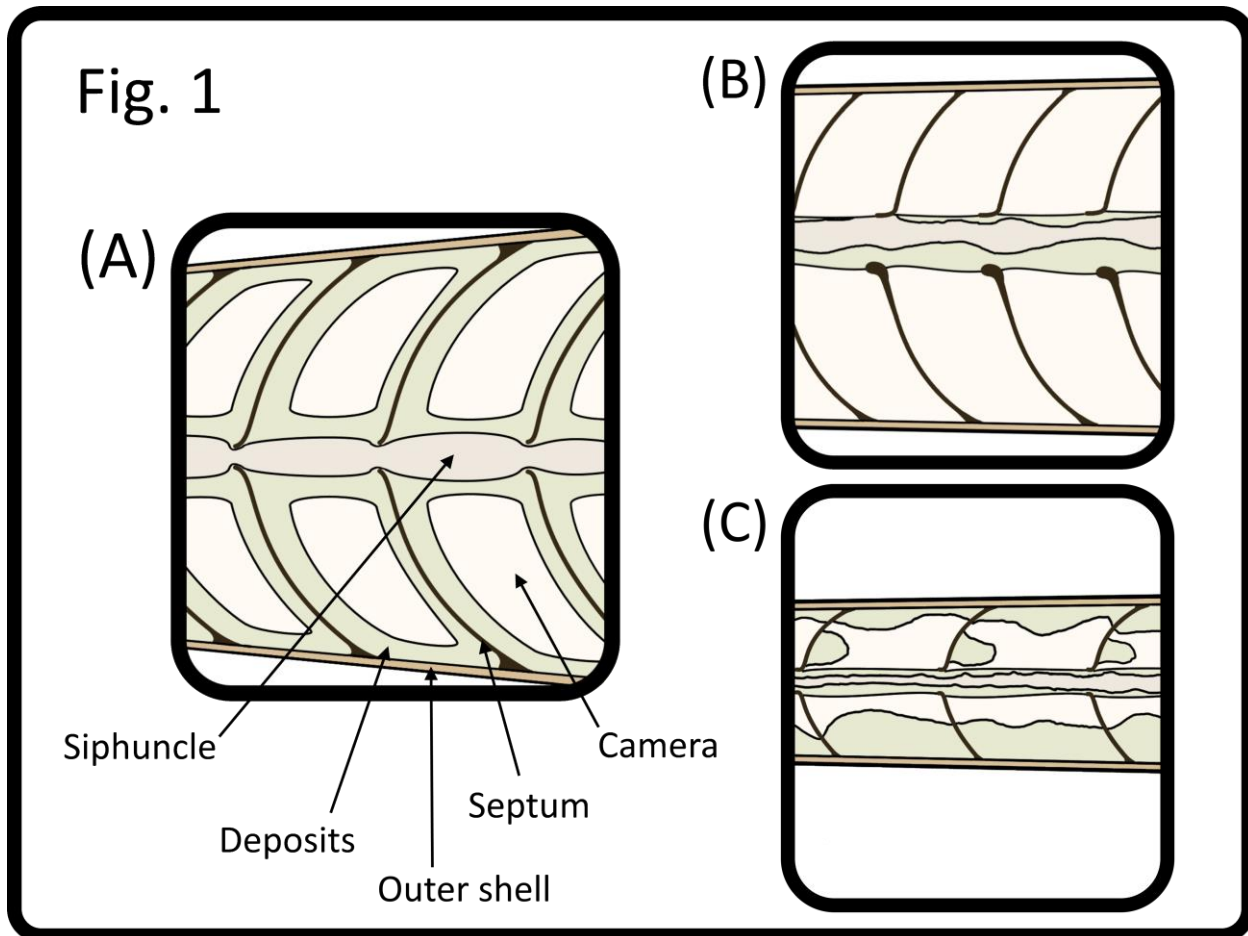
Rank	Name
Phylum	Mollusca
Class	Cephalopoda
Subclass	Orthoceratoidea
Order	Orthocerida
Family	Orthoceratidae
Genus	Orthoceras
Species	regulare

(†*Orthoceras Breyneus* 1832 (*Mollusk*), n.d.).

Long orthocone longicone, held vertically. Apertural angle small. Ecology nektonic carnivore. Cross section of shell cylindrical. Septal necks short, straight. Long living chamber. Siphuncle central to sub-central; tubular. Slight endosiphuncular deposits in the posterior chambers, more pronounced in the ventral parts. Longitudinal impressions on the living chamber (Kröger, 2004).

**Range:** Only found in south-eastern Sweden, Northern Germany and Poland. Darriwilian of the Ordovician (Kröger, 2004).

**It should be noted that some *Orthoceras* (*Orthoceras* sp., NMB C. 5381) have episeptal and mural deposits (Fig. 1C). (Kröger, 2004)**



**Fig. 1.** Shell structure in Michelinoceras and Orthoceras. **(A)** Depiction of a sectioned shell of *Michelinoceras* sp., with different components labeled. Note the deposit-clear siphuncle and hyposal deposits, as well as the shell expansion rate. **(B)** Depiction of a sectioned shell of *Orthoceras regulare*. Note the endosiphuncular deposits, lack of hyposal and episepal deposits, and the slow shell expansion rate. **(C)** Depiction of a sectioned shell of *Orthoceras* sp. Note the siphuncular deposits, the mural and episepal deposits, and the slow shell expansion rate.

## Discussion

Orthoceras was previously a wastebasket taxon, with a great number of species being assigned to it. Orthoceras has been cleaned up, but the name Orthoceras has still been overused by the public. Michelinoceras is a genus that was identified from Orthoceras; however, it too has become a wastebasket taxon. Michelinoceras can in large part be differentiated from Orthoceras in its distribution; Orthocerids from all over the world and from the Ordovician to the Triassic have been

assigned to *Michelinoceras*, while *Orthoceras* is restricted to the Ordovician of Northern Europe, especially near the Baltic Sea. When a specimen in question is found in this area, the bearing or lack of endosiphuncular deposits is what will tell for sure which genus it belongs to.

#### Works cited

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†*Orthoceras* Breynius 1832 (mollusk). (n.d.). The Paleobiology Database. Retrieved January 4, 2022, from [https://paleobiodb.org/classic/basicTaxonInfo?taxon\\_no=12557](https://paleobiodb.org/classic/basicTaxonInfo?taxon_no=12557)

†*Michelinoceras* Foerste 1932 (mollusk). (n.d.). The Paleobiology Database. Retrieved January 5, 2022, from [https://paleobiodb.org/classic/basicTaxonInfo?taxon\\_no=12542](https://paleobiodb.org/classic/basicTaxonInfo?taxon_no=12542)