

ROSTRUM AND PHRAGMOCONE STRUCTURES IN THE LOWER CARBONIFEROUS COLEOID *HEMATITES* AND ITS TAXONOMIC ASSIGNMENT

Doguzhaeva, Larisa A. ⁽¹⁾, Mapes, Royal H. ⁽²⁾, Mutvei, Harry ⁽³⁾

⁽¹⁾ Paleontological Inst. of the Russian Acad. of Sci., 117647 Moscow, Profsoyuznaya 123, Russian Federation, lenin33@paleo.ru;

⁽²⁾ Dept. of Geol. Sci., Ohio Univ., Athens OH 45701, USA, rmapes1@ohiou.edu;

⁽³⁾ Swedish Mus. of Nat. Hist., Dept. of Palaeozoology, SE-10405, Sweden; pz-harry@nrm.se

Flower and Gordon (1959) and Gordon (1965) considered *Hematites* as a belemnite. Jeletzky (1966, p.20) following the conclusions of Abel (1916) erected the new Order Aulacocerida and assigned *Hematites* to the order. However, he did not formally include this taxon in his classification. Flower and Gordon noted that the apical portions of the phragmocone had been removed prior to rostrum formation.

The conotheca lacks ventral or dorsal crests, growth lines and traces of proostracum, which Jeletzky considered important ordinal characteristics of the Aulacocerida. In *Hematites* the conotheca has been somewhat altered and it is unlike the conotheca in belemnites. There seems to be six layers from inside to outside: 1) A thin lamellar layer, 2) A thick columnar nacreous-like layer, 3) A thin nacreous? layer, 4) A thin layer with an outer spherulitic surface, 5) A thin layer with inclined lamellae, and 6) A thin layer with an inner spherulitic surface. Two specimens show that the body chamber was short equal to about 1.5 chambers in length. The ridged rostrum has the following significant morphological features: (1) Each ridge crest is covered by a row of filled pits separated by partitions. The pit-channels can be traced through the entire rostrum thickness. The narrow interspaces between the ridges extend to the conotheca. In some respects these ridge and pit structures are comparable to those on the external proostracum surface of the belemnite *Megateuthis* (see Doguzhaeva et al., herein), and that these surfaces served as the mantle attachment area. Thus, the mantle on *Hematites* was probably attached to the entire rostrum, whereas the rostrum in belemnites did not serve as an attachment function, 2) In all but one *Hematites* specimen the early phragmocone is missing, and the broken end is plugged with the central rod structure which is composed of parallel longitudinal carbonate rods that begins at the broken apical end of the phragmocone and continues to the apical end of the rostrum. This structure is exposed in the depression at the apical end of larger rostra, and everywhere else, it is covered by the radial rostral structure, 3) The thin, terminal edge of the rostrum on the conotheca forms a sinuous contact that includes a pronounced broadly U-shaped ventral sinus, and there is a suggestion of broad lappets in the lateral position. The ventral edge of the rostrum of one specimen extends farther orad than the dorsal edge.

Thus, *Hematites* differs from all other younger rostrum-bearing coleoids assigned by Jeletzky to the Aulacocerida by having a relatively short body chamber, a conotheca with a unique shell construction that is without growth lines and dorsal and ventral crests. The well-developed rostrum also has a number of unique structural features. Given these unique features, we are uncertain if the diagnosis of Jeletzky for the order Aulacocerida should be emended to accommodate *Hematites*, or if an entirely new order should be established to accommodate this primitive coleoid.