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Chasmops – a typical representative of the family *Pterygometopidae* (Reed, 1905) found in an aggregate mine in Mielenko Drawskie, West Pomerania Province, Poland

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ABSTRACT

The oldest trilobite being found so far in an aggregate mine in Mielenko Drawskie is the Cambrian trilobite *Agnostus* (Salter, 1864). In the area of the Drawsko Pomorskie District, it is possible to observe a wide range of Ordovician trilobites. Ordovician trilobites of order *Phacopida* (Salter, 1864) are to be found in this area quite commonly. The most frequently observed representative of the family *Pterygometopidae* (Reed, 1905) is a trilobite of the genus *Chasmops* from the Ordovician Period. It can be found in sedimentary rocks on sandy and stony fields throughout the whole Drawsko Pomorskie District.

***Keywords*:** trylobites; *Phacopida*; *Pterygometopidae*; *Chasmops*

1. INTRODUCTION

Trilobites appeared as early as the earliest Cambrian Period and reached their greatest development in the Cambrian and Ordovician Periods. Since the Silurian Period, a slow decline in their diversity occurred and, by the end of the Permian Period, their representative became extinct. Trilobites got their name from distinct three-sectioned carapace consisting of a head shield (*cephalon*), a segmented body (*thorax*) and a tail shield (*pygidim*). The three-section structure is also visible in the carapace cross-section, with a spindle-shaped axis (*rhachis*) and lateral lobes (*pleurae*) located on its both sides being identified here.

Formerly, there were attempts to associate trilobites with crayfish (old German name of trilobites is **Dreilappkrebse**, i.e. three-lobed crayfish) but for a long time there is no doubt that they are completely separate tribe of arthropods. Within the head shield, a more convex central part, called the glabella, which can be slashed with lateral furrows, is distinguished.

The frontmost section of the glabella, separated by a lateral furrow, is called the frontal lobe. A flat pleural area, called the genae (cheeks), is situated on both sides of the glabella. There are compound eyes on the genae.

The genae are divided by a suture, called the genal suture. This suture runs from the anterior part of the head shield, on the inner side of compound eyes, to the rear on the free cheeks, i.e. the librigena (between the glabella and visual folds), and on the fixed cheeks (fixigena) situated on their both sides. The genal suture that runs to the posterior margin of the head shield, is called the opisthoparian suture, whereas that one running to its side – the proparian suture; the genal suture that ends at the angle between the posterior and the lateral margins of the head shield is called the gonatoparian suture.

In trilobites with reduced eyes, the genal suture is found on the ventral side of the head shield and is called the hypoparian suture. The course of the genal suture is an important taxonomic characteristic in trilobites. Where the posterior and the lateral margins of the head shield meet, there are spines, called the genal spines, being frequently directed to the rear. Where the head shield and the body meets, there are a cylindrical structure called the occipital ring which is separated from the shield by the occipital furrow.

Separate head shields are most frequently found trilobite remains. Free cheeks (librigena) often fell off of the head shields and only the glabellae with the fixed cheeks (fixigena) were fossilised. The body (*thorax*) consists of a variable number of segments with loosely articulated to each other tergites. Lateral furrows, separating the glabella, move onto the thoracic segments and separate their more strongly convex central part that form the carapace axis *(rhachis*).

On the outer side of lateral furrows, the tergite transforms into flat lateral lobes (*pleurae*). The tail shield (*pygidium*) with a semicircular or elongated outline and of very different size covers a variable number of rear thoracic segments. The axis (*rhachis*) extends onto the *pygidium* and may continue almost to its end or overlap the *pygidium* very little.

On the pleural part of the *pygidium*, also of variable size, there may be found transverse furrows being parallel to the anterior margin of the carapace; these furrows may deflect to the rear on the sides and, in the case of strongly shortened axial zone, may have a fan-shaped arrangement; the pygidia may also be less or more smooth.

The lower part of trilobite carapace, being less resistant to damage, and limbs preserve only exceptionally. A pair of limbs is associated with each thoracic segment and a tergite corresponding to it. A limb consists of a basal element (*praecox*), on which a proper leg (*teiopodil*), composed of seven segments, is being situated. On the *praern*, a leg branch directed outwardly, functioning primarily as the gill, is also situated.

The head situated under the head shield is equipped with a pair of unbranched antennae and four pairs of limbs of the same structure as thoracic legs. Therefore, four segments, the limbs of which have not yet been transformed into the mouthpart, are included into the head section. Here, there is still preserved the primary homonomy of thoracic segments, while the dorsal skeleton already shows distinct heteronomous features. Also the limbs of the pygidial segments are identical with the thoracic ones but they diminish to the rear.

The homonomy of limbs differs trilobites from all other arthropods in which the limbs of the segments being included into the head section are transformed into a specialised mouthpart (mandible, maxilla and possibly also antennae). Trilobites are therefore a group of arthropods being stopped at a clearly initial level of body organisation, which coincides with their early appearance and main stages of development as early as the Older Paleozoic.

In relation to all other trilobites, the *Agnostids* that occur from the Middle Cambrium Period to the Ordovician Period have a special position. They are small forms that rarely reach 10 mm in length. Their head and tail shields are large, semicircular or elongated, of almost equal size and separated by only two or three thoracic segments. Most of them are the forms without eyes [1-32].

Throughout Poland, 170 trilobite species that belong to 84 genera being represented by 36 families are known from the Ordovician sediments. Among 170 trilobite species that are known across Poland, 21 species are new ones that belong to the Polish holotypes. In an aggregate mine in Mielenko Drawskie, it is possible to find different types of trilobites, such as: *Agnostus, Acaste, Chasmops, Dalmanitea, Lichida, Megistaspis, Asaphus, Phacops*, and many other.

This paper presents a typical representative of the Ordovician trilobite *Chasmops* of the order *Phacopida*. In an aggregate mine in Mielenko Drawskie (Fig. 1 & 2, it is possible to find trilobites of the genus *Chasmops*. The most frequently found elements are: trilobite head and tail shields that were brought to the northern Poland by the Scandinavian glacier. Photo 1 & 2. An aggregate mine in Mielenko Drawskie.

Photo 1. An aggregate mine in Mielenko Drawskie.

Photo 2. An aggregate mine in Mielenko Drawskie.

2. TRILOBITE MORPHOLOGY

Trilobites (Trilobita) – (gr. *treis* – three, *lobos* – lobe) – a class of extinct marine arthropods of a small size, with oval, dorsiventrally flattened body. Three major distinct sections (tagmata) can be clearly distinguished in their structure:

head shield (cephalon),
body (thorax),
tail shield (pygidium).

The head shield is semicircular in shape, with strong genal spines and a large, anteriorly expanded glabella. The pygidium is semicircular in shape, with transverse furrows, and almost as big as the head shield.

3. SYSTEMATICS OF A CHASMOPS TRILOBITE

Phylum: Arthropods (*Arthropoda*)
Class: Trilobites (*Trilobita*)
Order: *Phacopida* (Salter, 1864)
Suborder: *Phacopina* (Struve, 1959)
Superfamily: *Phacopoidea* (Havle & Corda, 1847)
Family: *Pterygometopidae* (Reed, 1905)
Genus: *Chasmops* (McCoy, 1846)

4. DESCRIPTION OF CHASMOPS

Trilobites of the genus *Chasmops* lived in the Middle and Late Ordovician Period. They are rarely found as complete specimens. It is therefore difficult to determine exactly the species affiliation of each specimen. Nevertheless, some specific characteristics allow specifying and determining the species name.

The photos below present first of all the head shields – cephala, and the tail shields – pygidia (Photo 3-9).

Photo 3. *Chasmops* – a head shield. Place of finding: an aggregate mine in Mielenko Drawskie.

Photo 4. *Chasmops* – a head shield. Place of finding: an aggregate mine in Mielenko Drawskie.

Photo 5. *Chasmops* – a head shield. Place of finding: an aggregate mine in Mielenko Drawskie.

Photo 6. *Chasmops* – a head shield. Place of finding: an aggregate mine in Mielenko Drawskie.

Photo 7. Chasmops – a head shield. Place of finding: an aggregate mine in Mielenko Drawskie.

Photo 8. *Chasmops* – a tail shield. Place of finding: an aggregate mine in Mielenko Drawskie.

Photo 9. *Chasmops* – a tail shield. Place of finding: an aggregate mine in Mielenko Drawskie.

5. CONCLUSION

An aggregate mine in Mielenko Drawskie is a good example of the occurrence of Ordovician trilobites as a reminder of Scandinavian glaciation. This rich source of the trilobite occurrence is a good place for further exploration and identification of particular fossil species.

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