

Echinocorys with bite marks^{*}

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Abstract

Bite marks on the test of the echinoid *Echinocorys scuiaius* LESKE 1778 from the Senonian of Lägerdorf with Itzehoe (Schleswig-Holstein) are illustrated and described. It is attempted to identify the cause of the marks from these observations.

Introduction

In the summer-months 1961 and 1962 I repeatedly visited the chalk-pits of the Breitenburger Portlandzement-Fabrik in Lägerdorf bei Itzehoe. In the early morning hours, I climbed down into the at that time approximately 25 m deep Alsen pit in order to collect fossils. As long as the sun was throwing long shadows over the high wall of the quarry, the fossils, only slightly different in color from the white chalk, were easy to spot. Once the sunlight was falling into the quarry, the dazzling reflected light made collection much more difficult. Although fossils are relatively rare in the Senonian of Lägerdorf, and collection limited by quarrying operations, I was able to collect a good cross-section of the representative fauna.

The corona of a *Echinocorys scutatus* LESKE 1778 described below was found with a rostrum of the belemnite *Goniot euthis quadrata* BLAINVILLE in the same horizon of the Lower Campanian.

Description the bite marks

Tracks, lateral

The illustrations show almost parallel tracks engraved on the corona with four slightly offset holes just below. The holes are in the form of pointed cones, and have a trapezoidal/oval section. They penetrate the test minimally, the perforation being just large enough to show the soft chalk filling.

Tracks, oral

On the underside, 4 longer and 4 shallower marks can be seen. The test is thicker here, and is not penetrated.

Attempts to the interpretation of the tracks.

The injuries were most likely caused by a predatory fish, and an attempt to reproduce them was made using recent echinoids. The method and results are described below.

First, a sharp, trapezoidal/oval section tooth was made. A steel etching needle (Grafikerwerkzeug) was worked to match the fossil holes by grinding and polishing. Test of *Paracentrous livdus*, the common stone-urchin, and *Echinocardium cordatum*, the heart-urchin were used as subjects.

^{*} Original citation: Geissler, Max. 1991. *Echinocorys* mit Bisspuren. *Aufschluss* 42:117-120

At first it was not found possible to penetrate the calcitic test of the urchin by fast stabbing, without smashing the ambulacral plates. It could only be penetrated by angling the needle to the wall of the corona.

The fossil markings were reproduced by holding the needle loosely in the hand at an acute angle of about 15°: the slipping needle dug a groove into the connective tissue.

In the case of the heart-urchin the markings corresponded closely to those on the fossil skeleton.

In order to establish that the marking were not produced after diagenesis, broken pieces of corona were from Lägerdorf were treated with the needle in the same way. It was found that scratching and stabbing with the destroys the calcitic crystallization of the ambulacra. In no case was it possible to penetrate the corona with the needle without breaking it.

On first impression it appears that the echinoid must have been attacked while alive, because a predator must surely be able to distinguish between an empty corona and living prey. However, this is not clear. Empty skeletons have been used by other marine organisms as protection K. GRIPP (1954). The internal walls of well-preserved echinoid tests are rarely at observed on specimens found in the chalk, presumably, because one doesn't break well-preserved tests in order to look at the inside walls.

Healed wounds

Healed cracks can be recognized around the injuries on the sides of the corona. The marks are well-defined, and the sides no longer level, so that the regenerated tissue bridging the crack can be seen as a smooth, even surface which shows as a lighter band along the line of the crack, going diagonally from there to the side-wall. It is likely that this is the result of an attack which the specimen survived.

Tiny tubercles on these healed break-lines cannot be described unequivocally as regeneration. However it should be pointed out it scratch-like bite marks on other echinoid -test of the Hemmoor-Schreibkreide are covered with have regenerated tubercles (GRIPP 1964, S.70).

Conclusion

The question of the perpetrator of the bite marks can only be clarified as far as saying that it was a predatory fish with strong, pointed and closely spaced teeth, such as *Enchodus*. The bite marks would match this. The prominent lower jaw of this genus could grasp the underside of the echinoid, while simultaneously the teeth short upper jaw would at first slip off the rounded upper side, creating furrow until they found a suitable angle to hold.

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