

mentioned species (*C. cypridioides* is restricted to the Deurne Sands) are very common throughout the Belgian Miocene, and form the basis of the ostracod associations, and are therefore important for paleoenvironmental reconstruction. Species of the genera *Sarsicytheridea*, *Cytheridea*, *Pontocythere*, *Muellerina* are sand-dwelling animals. It is therefore not surprising that precisely those species are attacked by naticid gastropods which live in the same environment. The presumed selective predation is only a result of thanatocoenosis analysis. In the biocoenosis naticids attack those ostracods which are living in their direct vicinity.

The analysis of bore-holes in ostracods confirm in this respect the paleoecological conclusions already drawn from faunal association analysis, namely the largely psamphilic character of the ostracod associations of the Belgian Miocene.

Gastropod Predation in some fossil and Recent corbulid Bivalves

by

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Several authors have raised the question whether gastropod drilling predation changed in intensity during the geologic record. Investigations mainly carried out on turritellid gastropods had suggested a major increase after the Mesozoic. Although the samples used for those investigations were small, the trend seemed real and had been stated also to occur on other prey animals. In the present study some of the data on corbulids previously used, were critically re-analysed and some other samples were studied personally. Several problems arose. Some are basically taphonomic: damaging and destruction of valves before and after death cause bias in every estimate of predation frequency. Valve transport after death must also be considered as a cause of bias. Other problems were caused by the integration of data of other authors: there is no apparent consensus in the counting methods, and some authors even use methods which may be subject to bias. Corbulid bivalves add, because of their periostracum-like layers in the shell, an additional taphonomic problem. These layers are the cause of the unusual morphology of many of the drill-holes on corbulid valves. As a result of this, it is impossible at present to distinguish on corbulids between naticid and muricid drill-holes.

Our results do not support the hypothesis of previous investigators: gastropod predation on corbulids seems not to have changed noticeably during the geologic record; the only possible difference might have taken place before the end of the Mesozoic (and not afterwards as was stated previously). Local differences in predation intensity at a given geologic moment were confirmed. Additionally the contradiction between fairly high predation intensities and the large proportion of unsuccessful drill-holes was noticed. Corbulidae seem to have very adaptive defense-mechanisms, yet predators still attack them. Further study of the impact of large prey-clusters on the preying behaviour of gastropod predators may help finding an explanation.

Ichnofossils from the Merksem Sands (Lower Pleistocene) in the Antwerp harbour area

by

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During the construction of the Berendrechtsluis, a new sealock, north of Antwerp, the Merksem Sands (Lillo Fm.) were exposed at between — 6 and — 22 m below sea level. They were covered by the late Pleistocene Zandvliet Sands, Holocene peat and modern deposits. The Merksem Sands show an alternation of loose, sandy sediments and harder, consolidated layers with a much more fine grained sediment. Body fossils are absent because of the decalcification of the sediment. Ichno-fossils are preserved as full reliefs in the loose layers and as convex epireliefs in the harder banks. They become rarer to the top of the Merksem Sands and are lacking in the Zandvliet Sands.

On the hard layers four ichnogenera were found: *Subphyllochorda* and *Cardioichnus*

(heart urchin traces), *Palaeophycus* and *Planolites* (traces of worms, molluscs, ...). They occur as horizontal convex epireliefs at the interface between hard and loose layers. In the hardened layers proper traces are lacking. The very fine sediment of those hardened banks suggest they originated in a mud environment with slow sedimentation.

In the loose strata all ichnofossils, except one, are oriented vertically. The crab trace *Ophiomorpha* occurs frequently, which indicates a probable sandy littoral or shallow sublittoral deposit. *Tasselia ordamensis* is common in the lower part of the Merksem Sands, where it forms dense clusters.

Three ichnogenera are present which seem to be undescribed. One forms a continuous level at about 4 m below the top of the Merksem Sands, and consists of hollow tubes (± 10 cm long), broadening towards the top (0.5 to 1 cm in cross section). The upper surfaces of the tubes seem to be slightly eroded. No body fossils were encountered near these tubes, so their originator is unknown.

The loose sandy layers seem to have been formed during a sudden acceleration of the sedimentation. Many of the vertical ichnofossils present in them should be considered as fugichnia. The complete sequence of sandy and clayey layers must have been deposited in a relatively short time-interval, because otherwise bioturbation would have destroyed fragile structures such as *Subphyllochora* and *Cardioichnus*.

III. ECHINODERMATA AND MOLLUSCA

Paleoecological studies on Cretaceous oysters and the limitations of oyster systematics

by

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Recent oysters from the tidal and subtidal zones have been shown to have morphologically very different ecomorphs, induced by sunlight and by the type of attachment area. The existence of such polymorphy in genera belonging to the family Ostreidae makes paleontological studies of many genera (*Crassostrea*, *Lopha*, *Ostrea*, *Saccostrea* ...) partly pointless; indeed, a reasonable 'species-concept' cannot be applied. Yet, « oyster-types » which obviously sometimes only represent ecomorphs can be recognised in many Cretaceous localities. Oysters occur frequently there in large numbers per 'species' and in a wide diversity of species. An analysis of the oyster faunas in well known Late Cretaceous localities in Europe indicates a number of different faunal associations with clear paleoecological implications. The following faunas can be differentiated :

1. dominance of *Rastellum* species, and numerous *Exogyra*'s, but no or few *Pycnodonte*'s : very shallow, near-shore; if *Pycnodonte*'s are absent probably intertidal (example : Ifö, Sweden),
2. dominance of *Pycnodonte* (*Phygraea*) species, no *Exogyra*'s : relatively deep/cold seas (example : the Northern European White Chalks of the Schreiekreide-type, but also Meudon in the Paris Basin),
3. *Pycnodonte* (*Phygraea*) is relatively rare, but *Pycnodonte* (*Pycnodonte*) occurs frequently, along with *Exogyra*'s and large sized *Rastellum* sp. (example : White Chalks from southern near-Tethys deposits, such as in the Charente or in Crimea, S. USSR).

Paleoecological differentiation in this case also helps paleobiogeography.

Why are regular Echinoids rare?

by

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The ratio of regular to irregular echinoid species and specimens can vary strongly, according to environmental factors. In the actual biosphere, 53 % of all living species are regular.