

The Tournaisian rugose corals of Tournai: revision of a classical fauna

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The “Calcaire de Tournai” is mainly Ivorian (upper Tournaisian) and developed in the western part of the Hainaut sedimentation area. This part of the Namur-Dinant Basin was marked by an important subsidence that led to the deposition of about 500 m of argillaceous limestone of monotonous facies (HENNEBERT & DOREMUS, 1997).

The “Calcaire de Tournai” has been divided into (1) the Tournai Formation, mainly consisting of wackestones in which bioclasts result of a nearly *in situ* accumulation and dissociation of the organisms, and (2) the Antoing Formation, mainly composed of mudstones, characterised by numerous ichnofossils (*Zoophycos*).

The sedimentological study agrees with the more recent interpretations of the depositional environment. The part of the Tournai Formation which has been studied in this work (upper part of the Providence Member and the Pont-à-Rieu and Vaulx Members) corresponds to an open shelf environment, situated below the storm wave base, his uppermost part (Vaulx Member) shows a weak deepening trend preceding the deeper and restricted environments of the Antoing Formation (Calonne lower Member and lower part of the Calonne upper Member).

The “corallian fauna of Tournai”, mainly benthic, is rich and very diversified. It includes many tabulate and rugose corals which were primarily studied during the 19th century by MICHELIN, DE KONINCK and MILNE-EDWARDS & HAIME, and at the beginning of the 20th century by SALÉE, CARRUTHERS and LECOMPTE. Since then these corals were almost not studied, so that currently and in spite of the abundance of specimens, they remain still very badly known.

Moreover, huge collections were collected during decades without exact locations and stratigraphic positions, so that their distribution in the lithostratigraphic units of Tournai is not known.

It was thus useful to re-examine the systematic on the basis of the modern classification and to define the stratigraphic distribution of the rugose corals present in the Tournai area and to specify their paleoecology. With this intention, numerous specimens were collected in the accessible parts of two still active quarries in the Tournai area and their stratigraphic position specified. Specimens coming from old collections were also studied for comparison and to supplement materials collected in the quarries.

The systematic revision of the rugose corals allows to confirm the presence of nine species previously recorded in the area (*Amplexus coralloides*, *Cyathaxonia cornu*, *Proheterelasma omaliusi*, *Zaphrentites delanouei*, *Sychnoelasma konincki*, *Caninia cornucopiae*, *Siphonophyllia cylindrica*, *Caninophyllum patulum* and *Eostrotion tortuosum*). Three other species were recorded for the first time (*Saleelasma* cf. *delepini*, *Pentaphyllum* sp. and *Aulokoninckophyllum* sp.) and three are new: *Hapsiphyllum* nov. sp. 1, *Caninia* nov. sp. 1 and *Siphonophyllia* nov. sp. 1.

Lophophyllum konincki, the type species of the genus *Lophophyllum*, defined by MILNE-EDWARDS & HAIME (1850) from 6 specimens from the Upper Tournaisian of Tournai, was revised based on the new collected material. It corresponds to a young stage and is a junior synonym of *Caninia cornucopiae*. The latter showing a very large morphological variability (POTY, 2007).

The small rugose corals without dissepiments formerly grouped in “*Zaphrentis*” (*Proheterelasma*, *Zaphrentites*, *Hapsiphyllum* and *Sychnoelasma*) are abundant in Tournai, they show very similar characters in the juvenile stages and thus generic and specific distinctions are usually difficult to establish. The great variability of *Caninia cornucopiae* and the similarity of the young stages in the small “*Zaphrentis*” could be a response to a deep and stable environment with low selective pressure.

The distribution of the recorded species was established for the first time in the area. The Tournai Formation is rich in rugose corals unlike the Antoing Formation which is almost devoid of them, except for its base. Foraminifers and conodonts are very uncommon. The biostratigraphic correlations, based on the

rugose corals biozones defined by POTY et al (2006), allow to attribute the Providence Member (Tournai Formation) to the RC3 α subzone and thus, to correlate it with the Yvoir Formation of the Condroz sedimentation area. The Pont-à-Rieu and Vaulx Members correspond to the RC3 β subzone, and thus are equivalent to the Ourthe Formation. The paucity of rugose corals in the Antoing Formation does not allow any correlation.

HENNEBERT, M. & DOREMUS, E. (1997): Antoing-Leuze, (37/7/8). Carte géologique de Wallonie (1/25000) et sa notice explicative. - Edition de la Région wallonne, Jambes, 74 p.

MILNE-EDWARDS, H. & HAIMES, J. (1850): A monograph of the British corals. Introduction ; corals from the Tertiary and Cretaceous formations. - Palaeontographic Society of London, First part, i-lxxxv, 1-71.

POTY, E. (2007): Revision of the type species of the genera *Lophophyllum* Milnes-Edwards & Haime, 1850 and *Caninia* Michelin in Gervais, 1840, from the Upper Tournaisian of Tournai (Belgium). - Abstracts of the Xth International Symposium on fossil Cnidaria and Porifera, St. Petersburg, Russia, p. 75.

POTY, E., DEVUYST, F.-X. & HANCE, L. (2006): Upper Devonian and Mississippian foraminiferal and rugose coral zonation of Belgium and Northern France: a tool for Eurasian correlations. - Geological Magazine, **143**: 829-857.