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## **ABSTRACT BOOK**

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## Exploration of morphospace in the Viséan rugose coral *Siphonodendron martini*

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*Siphonodendron martini* is one of the most common colonial rugose corals through the Viséan of Western Europe, North Africa and Turkey. The species evolved from *S. ondulosum* in the early Viséan through progenesis and a reduction of size. During the rest of the Viséan (i.e. during c. 10 My), *S. martini* is characterised by a very stable morphology. However, some trends in size and thickening, possibly in link with the environment were long suspected. The aim of this study is to explore statistically the morphospace of this abundant and very regular species in order to detect morphometric variations either in time or in space or through environmental settings.

The Belgian Viséan succession is probably one of the best documented in terms of depositional settings and stratigraphy and the large collection of *S. martini* available acts as a good sample for the analysis. For comparison, time-equivalent specimens from Morocco, UK and Turkey were also included in the dataset. Eight morphometric characters were measured in at least ten individual per colony: external diameter, tabularium diameter, number of septa, length of minor septa, length of major septa, length and width of columella and number of dissepiment rows. Additionally, the presence/absence of thickening of septa, dissepiments and wall were noted. After normalisation of the raw data, PCA analysis was run with R.

It appears that most of the variation is carried by the diameter and number of septa in all samples, which confirms the value of such diagnostic character. However, the development of the columella and dissepimentarium is strongly related to environment, seemingly to hydrodynamic conditions, as often suspected.

Cluster analysis tends to show no clear locality of age-related clustering, suggesting that variation is similar both in time and space.

Principal component analysis shows that colonies coming from different localities of the same age (at least the same biozone) are significantly more different than colonies of different age. In other words, more variability is explained by local conditions than as variation through time (phenetic). It confirms that *S. martini* has a relatively stable morphology throughout its stratigraphical extension, with some exceptions, notably within the oldest colonies of the lower Viséan.

Comparison with other species of *Siphonodendron* indicates that the variation is similar and therefore that the variability signal is probably a supra-specific character. Further investigation of homeomorphic corals (such as the Australian *Cionodendron* spp.) could possibly demonstrate that the taxonomy, besides environment, explains the way variability is expressed in corals.