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UNDERSTANDING ENDEMIC CLADES WITHIN COSMOPOLITIAN FAMILIES: LOWER CARBONIFEROUS SYRINGOPORID CORALS FROM EASTERN AUSTRALIA

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Geographic isolation is one of the widely accepted factors controlling evolution (e.g. speciation), but taxonomic research on fossil corals commonly does not take palaeogeography adequately into account.

Syringoporid corals are clonal organisms with relatively simple structure. Few characters are taxonomically important, and the degree to which some characters reflect palaeoecological influences is still uncertain. Taking into account the simplicity of the corallites, the small number of characters, morphological variability, and long geological record of the group, homemorphy cannot be excluded, and, to the contrary, seems to be very likely. For instance, the geological record of *Multithecopora* contains a gap representing the entire Devonian.

Eastern Australian syringoporoids are significant for the systematic evaluation of the entire Early Carboniferous syringoporoid clade, because the eastern Australian subclade is most likely to have evolved in geographic isolation on the basis of co-occurring highly endemic rugose coral faunas and the isolated palaeogeographical position on the eastern end of Gondwana. Hence, character transformations that occurred in eastern Australian syringoporoids are unlikely to be homologous to those in other regions. Hence, the Australian clade can be interpreted as a simplified evolutionary lineage where particular character transformations can be observed without the complication of intermixing various clades through migration events, which may complicate syringoporoid systematics in Tethyan and Euramerican regions.

The oldest Australian syringoporid taxa occur in the lowermost Tournaisian Gudman Formation. Although an Eastern Australian Upper Devonian precursor is unknown, the taxa clearly belong to the genus *Syringopora* indicating migration into eastern Australia. Numerous septal spines are one dominant character of the Tournaisian taxa.
Throughout the Lower Carboniferous several individual evolutionary trends occurred, mostly culminating in new genera. 1) Steroplasmatic thickening of tabulae and loss of infundibular tabulae gave rise to a new genus (formerly assigned to *Multithecopora*). 2) Relative increase of thickness and length of septal spines led to *Spinuliplena.* 3) Reduction of intracolonial corallite distances resulted in Australian '*Roemeripora*' (close to *S. samsi*) and higher integration of the corallites to *Pseudoroemeripora.* 4) Simplification of the organisational pattern of septal spines and tabulae also occurred within *Syringopora.*

Some eastern Australian syringoporid taxa show superficial phenotypic similarities to taxa of other areas, but major internal differences clearly developed independently from older eastern Australian taxa. However, migration cannot be totally excluded and might include Panthalassian taxa.