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# Geological sequence of origination of coralline taxa defined by molecular phylogeny

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Coralline algae have a high preservation potential as fossils due to calcite impregnations of their cell walls. Their long fossil record, extending back to the Early Cretaceous, is thought to accurately reflect the evolutionary history of the group. Published records checked in the light of diagnostic characters used to identify present-day corallines demonstrate that the origination sequence over the geological time of major taxa matches the phylogeny based on the 18S rDNA and morphological/anatomical traits proposed by Harvey et al (2003). The first confirmed record of fossil corallines belongs to the family Sporolithaceae, *Sporolithon rude* from the Hauterivian (Early Cretaceous). The melobesioid *Lithothamnion* within the family Hapalidiaceae is the next genus recorded, in Albian rocks. *Mesophyllum*, a derived genus within the subfamily Melobesioideae, first appeared in the Late Cretaceous-Early Palaeocene. The oldest record of Corallinaceae corresponds to geniculate forms from the Albian. The mastophoroid *Lithoporella* seems to be the first representative of fossil non-geniculate corallinaceans (early Late Cretaceous, ~90 Ma). The first feasible fossil lithophylloid, a derived group within the Corallinaceae, is *Distichoplax biserialis* from the Danian. The anatomical structure of *Distichoplax* is comparable to the present-day lithophylloid *Tenarea*. The first convincingly representative of the genus *Lithophyllum* seems to be early Miocene in age (~20 Ma), although *Titanoderma*-like specimens appeared earlier in the Late Eocene.

**References**

Harvey A.S., Broadwater S.T., Woelkerling Wm.J., Mitrovski P.J. (2003): *Choreonema* (Corallinales, Rhodophyta): 18S rDNA phylogeny and resurrection of the Hapalidiaceae for the subfamilies Choreonematoideae, Austrolithoideae, and Melobesioideae. J. Phycol. 39: 988-998.