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Carboniferous and Permian calcareous algae are known from marine deposits of the Southern Alps (Dolomites, Carnic Alps, Karawanken Mountains, Julian Alps).

PIA (1937), in summarizing the knowledge of these days, stated the occurrence of dasyclads and various porostromate algae in Lower Permian deposits of the Carnic Alps and in Upper Permian of the Dolomites. PIA (1920, 1922) was the author of two very common and widely distributed Late Paleozoic dasycladacean genera: *Anthracoporella* and *Epimastopora*. The type species of both genera were described from the Carnic Alps. Both genera are important rockbuilders (constituents of Lower Permian reef mounds, cf. FLÜGEL 1987; and constituents of shelf carbonates) but the morphology and the systematic position of these taxa is still a matter of discussion (cf. FLÜGEL & FLÜGEL-KAHLER 1980).

The first comprehensive investigation of Early Permian algae from the Carnic Alps was published by HOMANN (1972) who studied rich and diverse algal floras from the Rattendorf and Trogkofel Group of the Carnic Alps. FLÜGEL (1966) and FLÜGEL & FLÜGEL-KAHLER (1980) investigated Permian algae from various localities (Nassfeld, Rattendorf Alm, Trogkofel area, Forni Avoltri) in the Carnic Alps.

Altogether, about 70 algal taxa have been described from the Permian (Asselian, Sakmarian, Artinskian) and about 15 from Late Carboniferous (predominantly Gzhelian) rocks. Most of the taxa belong to dasycladaceans, fol-

lowed by phylloid algae and ancestral corallines, as well as solenoporaceans and porostromate algae. Gzhelian, Asselian and partly also Sakmarian algal floras differ significantly in taxonomic composition and biodiversity from the algal flora from the Artinskian, characterized by low-diverse associations of few dasyclads, *Archaeolithoporella*, phylloid algae and *Tubiphytes*.

These differences correspond to significant changes ('Einschnitte') within Permian algal floras (FLÜGEL 1990):

A comparison of the taxonomic composition of algal communities from the Lower *Pseudoschwagerina* Formation, the Grenzland Formation and the Upper *Pseudoschwagerina* Formation (uppermost Gzhelian = upper part of the Lower *Pseudoschwagerina* Formation; and Asselian) shows that about 35% of the algae occurring within the Grenzland Formation are absent in the Upper *Pseudoschwagerina* Formation. This may be caused by differences in facies and environment. The algal flora of the Asselian Upper *Pseudoschwagerina* Formation corresponds to that of bedded Trogkofel Limestones (Artinskian) pointing to a strong facies control again. Both units are open-marine platform carbonates. Striking changes in the composition of algal floras of the Carnic Alps are expressed by differences between floras from the bedded Trogkofel Limestone and from the Goggau Limestone (Late Artinskian in age). These changes in the composition, diversity and also in the frequency of groups or taxa were probably not synchronous in the Southern Alps and in other Lower Permian algal environments (e.g. Urals) indicating strong climatic and palaeogeographic controls of algal distributions.



References

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