man auch heute noch in verschiedenen Pflanzen. So leben einige Hornmoose (Anthocerotophyta) mit Cyanobakterien zusammen und gehen zugleich mit Vertretern der Glomeromycota eine Lebensgemeinschaft ein. Von Zykadeen (Gymnospermae), Vertretern der Gattung *Gunnera* (Angiospermae) sowie einigen epiphytischen Orchideen (Angiospermae) ist das gleichzeitige Vorkommen von endophytischen Cyanobakterien und Mykorrhizapilzen bekannt. Welche Vorteile diese Trisymbiosen für die einzelnen Partner haben, ist allerdings bis heute weitgehend ungeklärt.

THE CRANIAL AND DENTAL MORPHOLOGY OF PYCNODONT FISHES (NEOPTERYGII, PYCNODONTIFORMES)

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Pycnodontiformes is a monophyletic group of predominantly Mesozoic neopterygian fishes with mostly deep and laterally compressed bodies. They are highly specialised fishes concerning their prey. The cranial and dental morphology of pycnodonts is very characteristic and will be summarized.

In addition, the histology of pycnodontiform crushing teeth is discussed for the first time. The differences in the arrangement of woven and parallel acrodin layers between pycnodontiforms and teleosts and the absence of an outer shiny layer at the surface of the tooth crown consisting of small crystallites in pycnodontiforms indicate no closer relationships between both groups. This interpretation is supported by phylogenetic hypotheses showing pycnodont fishes to be a plesiomorphic sister group of teleosts.

The dentition of pycnodontiforms is characterized by considerable intrageneric and even intraspecific variation. Biometric characters, generally assumed to be independent of other characters, are applied to pycnodontiform dentitions and teeth. However, the biometric data and the corresponding aw/l-indices show that this method has great potential but that more data is necessary. These data also help separating plesiomorphic and advanced groups. Stomach contents, the presence of incisiform grasping teeth and a specialised branchial armature in several pycnodontiforms indicate that the guild of grazers and browsers (herbivorous morphospace) might already have been realised in the Mesozoic conversely to recently published hypotheses.

The phylogenetic relationships of pycnodontiforms are explored using only cranial and dental characters. The most noticeable result is that there are drastic differences when different data sets are used. The current analysis implies that skull and dental morphologies of pycnodontiform fishes alone are contradicting each other and cannot provide deeper insights into the phylogenetic interrelationships of pycnodontiforms at the moment. The differences between this and previous studies also indicate that there is still the need to search for more characters and to employ different outgroups.

The cranial anatomy of pycnodonts exemplifies general evolutionary trends such as reduction of dermal skull covering, increasing upper jaw mobility, and improvements in food gathering and processing. These changes, however, are not completely in accordance with the phylogenetic hypothesis presented here.