



Reproductive anatomy of selected fossil species of the genus *Mesophyllum* (Central Paratethys)

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The diagnostic characters of the recent *Mesophyllum* species differs from those available to observation in the fossil, due to conservation issues. While biologists operate with features contained in all reproductive phases of the life cycle, paleontologists consider the definition of Lemoine (1928), based on the combination of multiporate conceptacles and coaxial hypothallus as reliable to delimit *Mesophyllum*. However, the newly erected genus *Melyvonnea* accommodates species previously included in *Mesophyllum* having: a) perithallial protuberances that may branch and dominate over the encrusting base, b) monoecious gametophytes with gametangial conceptacles occasionally developed in superimposition, c) spheroid carposporangial chambers lacking a central pedestal, and d) filaments lining canals of multiporate roofs composed of 3 to 5 cells with distinctively elongate basal cells. The new genus shares with the emended *Mesophyllum sensu stricto* and with some species of *Synarthrophyton* the development of a predominantly coaxial hypothallus. Therefore, without the description of characters associated with reproductive anatomy, the taxonomic position of fossil species known as *Mesophyllum* would remain uncertain. For purpose of application of emended generic concept of *Mesophyllum s.s.* we analyzed published material and newly collected Badenian (Langhian – Early Serravallian) samples from Transylvania, Novohrad, Danube, Vienna and Carpathian foredeep basins. Preliminary results show that three types of pore canal cells in tetra/bisporangial conceptacles are present: 1) same as other roof cells or thinner-wider near the base of the pore canal; 2) shorter or of the same length and all thinner-wider than roof cells and 3) elongated at the base and shortened towards to the top of the pore canal and all thinner-wider. Type 3) contains two subgroups separated on the basis of the type of cell shortening: shortening distinct and clearly evident versus weak shortening. Roof morphology and pore canal anatomy are available diagnostic characters at species and generic rank for fossil *Mesophyllum*. We have also observed carpogonial, carpogonial and spermatangial plants. Known gametangial plants are dioecious and no carpogonial and spermatangial conceptacles occur in a single plant. To the contrary, two observed carpogonial-carpogonial plants possess both, carpogonial and carposporangial conceptacles, proving their carposporophyte-gametophyte life cycle phases. Carposporangial conceptacles show distinct central pedestal when properly cut. Although our results suggest that tetra/bisporangial plants far exceed in amount the carposporophyte and gametophyte plants, further research would complete missing data and improve understanding of the paleogeographic distribution of the genus *Mesophyllum s.s.*