



Palynological and palaeobotanical investigations in the Miocene of the Yatağan basin, Turkey: High-resolution taxonomy and biostratigraphy

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The subject of this study is the palynology (biostratigraphic and taxonomic) and the plant remains of the lignite strip mines of Eskihisar, Salihpasalar, and Tinaz (Muğla province, western Turkey). In the Yatağan basin two Miocene to Pliocene formations are present, the Eskihisar Formation (early to middle Miocene) and the Yatağan Formation (late Miocene to early Pliocene). Both formations represent river and lake deposits consisting mainly of conglomerate, sandstone, claystone, limestone, tuffite, and intercalated lignite; the thickest, actively mined lignite seams occur in the Sekköy member of the Eskihisar Formation.

Previous palynological studies of the palynoflora of the Yatağan basin mainly focussed on its biostratigraphic and palaeoclimatic significance, using conventional morphological nomenclature and light microscopy (LM).

In this study the „single grain method“ is applied. Using this method, the same individual pollen grains are investigated by using both LM and scanning electron microscopy (SEM). The resulting high-resolution pictographs enable a much higher taxonomic resolution.

The studied palynoflora is very rich and taxonomically diverse. Cryptogams are represented by more than ten spore morphotypes of at least three families (Osmundaceae, Pteridaceae, Polypodiaceae). Gymnosperm pollen is dominated by Cupressaceae, Gnetales (Ephedra), and Pinaceae (Cathaya, Keteleeria, Pinus). Angiosperm pollen can be assigned to 57 different genera belonging to Poaceae, Typhaceae, Altingiaceae, Amaranthaceae (Chenopodiaceae), Anacardiaceae, Apiaceae (three types), Asteraceae (Asteroideae, Cichoriodeae), Betulaceae (Alnus, Betula, Carpinus, Ostrya) Buxaceae, Campanulaceae, Caprifoliaceae (Lonicera), Caryophyllaceae, Dipsacaceae, Eucommiaceae, Euphorbiaceae, Fabaceae, Fagaceae (Fagus, Quercus, Trigonobalanopsis) Geraniaceae, Juglandaceae, Linaceae, Malvaceae (Tilia), Myricaceae, Oleaceae (four different types), Plumbaginaceae, Polygonaceae (Rumex), Rosaceae, Sapindaceae (Acer), Ulmaceae (Cedrelospermum, Ulmus, Zelkova), and Zingiberales (Spirematospermum).

In addition, more than two thousand plant macrofossils were collected in the course of repeated field trips, including remains of Pinaceae, Berberidiaceae (Mahonia), Betulaceae (Alnus, Carpinus), Buxaceae (Buxus), Fagaceae (Fagus, Quercus), Lauraceae, Malvaceae (Tilia), Myricaceae (Myrica), Rosaceae, Salicaceae (Populus, Salix), Sapindaceae (Acer), Smilacaceae (Smilax), Typhaceae (Typha), Ulmaceae (Zelkova).

A combined analysis integrating these rich and diverse plant macro- and microfossil records will lead to a better understanding and refined reconstruction of the vegetation in the Yatağan basin during the middle to late Miocene.