

SHORT COMMUNICATION

FIRST OBSERVATION ON THE HIGHER ORGANIZED
BIOPOLYMER STRUCTURES OF THE EXINE OF BISACCATE
GYMNOSPERM POLLEN GRAINS

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During our experimental studies of the biopolymer structures of the sporoderm of recent and fossil taxa, with the Helix enzyme method we have established differences between the gymnosperm and angiosperm exines (KEDVES, 1987a). But SOUTHWORTH (1985a,b, 1986) using the acetolysis method and the partial extraction with hot 2-aminoethanol described the granular substructures of the exines which are arranged in pentagonal polygons at the pollen grains of recent *Lilium longiflorum* THUNB., *Fagus sylvatica* L., and *Juniperus communis* L. Our new experiment on the degradation partial of the exines by different solvents, combined with the TEM method, resulted some new information about the biopolymer organization of the spore-pollen wall. Among others, the method with 2-aminoethanol, and KMnO_4 aq. dil. resulted in the pentagonal polygon subunits at several taxa, including gymnosperm and angiosperm pollen grains, too (KEDVES, 1987b). In this way, by the different methods different results were achieved on the same subject. Since during our first experimental studies, the saccate gymnosperm pollen grains seemed to be the most difficult in this respect, studies of the pollen grains of the genera *Pinus* and *Abies* were carried out. This paper as a preliminary report summarizes the first results on the partially degraded exine of *Abies concolor* HOOPES: 1. The pentagonal polygon subunits, as the quasi crystalline structure was observed at the whole part of the exine of the pollen grain. 2. On the surface there are larger (25—37 Å) globular units (cf. KEDVES et al., 1974, HESSE, 1985). 3. Remnants of lamellar structure were observed at the foot layer. This must be studied later, but the lamellar foot layer, based on our up-to-date knowledge exhibits an early ultrastructural characteristic feature. A characteristic lamellar foot layer was described by MEYER and RASKATOVA (1984) from the most earlier saccate gymnosperm pollen grain (*Archaeoperisaccus* NAUM.). MILLAY and TAYLOR (1974) described lamellar layer from Paleozoic saccate gymnosperm pollen grains; *Felixipollenites*, *Vesicaspora*. In this respect it is important that foot layer of the *Triadispora bölcii* SCHEURING 1970 from the Triassic is compact (SCHEURING, 1976). Following VAN CAMPO and SIVAK (1972) on fractured exine of the recent *Abies concolor*, on the SEM pictures seems to be compact. The detailed study of the biopolymer organization on the recent saccate gymnosperm pollen grains will be published later.

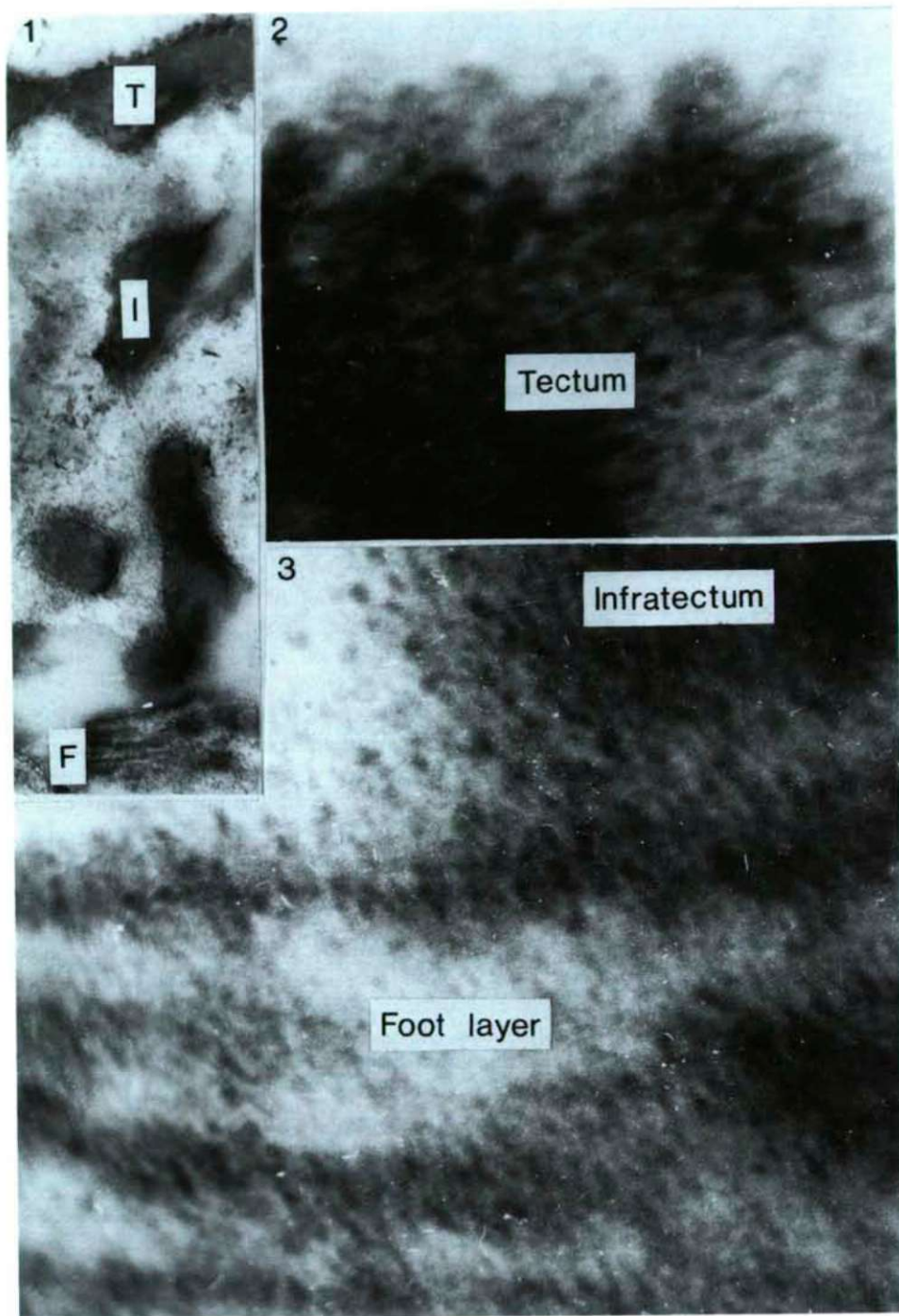


Plate 1.

Abies concolor HOOPES, partially degraded exine of the pollen grain (Experiment, No 81: 20 mg air dried pollen grains — 1 ml 2-aminoethanol, temperature 30°C, length 24 + 10 ml KMnO₄ aq. dil., temperature 30°C, length of 24^h. 1. x50000, 2,3, x500000.

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