

7. THE THERMAL ALTERATIONS OF THE POLLEN GRAINS OF *VISCUM ALBUM* L. (LORANTHACEAE, S. STR. VISCACEAE)

Short communication

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The taxonomical and phylogenetical importance of the high temperature effect on the basic morphology of the sporomorphs was reported first by KEDVES and KINCSEK (1989). Modelling of the most important evolutionary steps of the angiosperm pollen grains is one of the most significant research programmes of the laboratory. The subject of this short communication is in close connection with the upper mentioned paper (KEDVES et al., 1993). The hemiparasitic character and the palynological peculiarities of the *Loranthaceae* attracted our attention to this species.

The occurrences of *Viscum album* L. in Hungary were investigated by ROTH (1926) with complementary data by BOROS (1926). According to ROTH (1926) the occurrence of *Viscum album* L. on *Pirus malus* L. is very common including further woody species of the *Rosaceae*. But there are several observations about the occurrence on *Robinia pseudoacacia* L., *Salix* spp., *Tilia* spp., and *Abies alba* MILL. The investigation material was collected by Dr. S. GULYÁS and Dr. I. SZÖLLŐSI on 28. 3. 1991 from *Pyrus communis* L. in the woods of Zalaegerszeg. Fresh and pollen grains heated on 200 °C during one hour were the subject of the investigations. The pollen grains were mounted in glycerin-jelly hydrated of 39.6 per cent.

Regarding the LM morphology of the pollen grains of the *Loranthaceae* there are a number of publications. On the basis of the book of ERDTMAN (1952) the earliest data were published by KOELREUTER in 1763 in this subject. It is necessary to emphasize the important contribution to the angiosperm bibliography by THANIKAIMONI (e. g.: 1972, 1980, 1986). FEUER and KUIJT (1982) published important TEM results. The investigated material was classified into two groups on the basis of the pollen and flower morphological characteristic features with *Viscum album* in the second one, the pollen grains of which are characterized by rodlets and echinate sculptural elements.

The basic LM morphological characteristic features of the fresh pollen grains are as follows.

The pollen grains are tricolpate (tricolporoidate) (Plate 7.1., fig. 1–4, 17–20). Amb circular. Exine tectate, perforate with supratectate ornamentation. The sculpture is heterogeneous. In the inter-apertural area there are rods

(baculi) ranging from 2.5 to 3.5 μm (Plate 7.1., fig. 3, 17). Particularly in the colpus margin (area) there are tiny ornamental elements, rodlets or spinae. Endexine and intine are relatively thick.

The alterations of the pollen grains after heating are peculiar (Plate 7.1., figs. 5–16, fig. 21). These are a little similar to those observed at the pollen grains of *Quercus robur*, see in the previous contribution (KEDVES et al., 1993).

1. There are characteristic *Longaxones* forms (Plate 7.1., figs. 11–16). At these pollen grains the colpal area is typical with colpus margin or costae.

2. Some forms are similar to *Brevaxonate* types (Plate 7.1., fig. 7–10).

3. Finally there are forms without remarkable alteration (Plate 7.1., fig. 5; 6).

The quantity of the pollen material was not sufficient for establishing the variation-statistical graphs of the alterations in the size and the P/E axis ratio. But the diameter of the fresh pollen grains is 33.0–40.0–45.0 μm . The more or less isodiametric pollen grains after heating are about of 35.0–42.5 μm in diameter. The difference between the fresh and the experimental material is not important. The P/E axis ratio of the “elongated” pollen grains is for example the following: 50.0/35.0 μm , 47.5/32.5 μm , 45.0/37.5 μm , etc.

Summary: the alterations in consequence of high temperature have an intermediate character, which is similar to the hemiparasitic physiology.

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Plate 7. 1. ►

- 1.—21. *Viscum album* L., recent.
- 1.—4. Fresh pollen grains. 1000x.
- 5.—16. Experiment No 1055. 1000x.
- 17.—21. Experiment No 1055. 3000x.

