

**INTRASPECIFIC MORPHOLOGICAL VARIATIONS
AT RECENT ANGIOSPERMATOPHYTA POLLEN GRAINS**
(Short communication)

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Abstract

In this paper the taxonomical value of the morphological varieties of the recent Angiospermatophyta pollen grains is summarized. We have succeeded in establishing more than one type of varieties. The numerical variety of the germinal aperture at *Brevaxones* is frequent enough, at *Longaxones*, however, it is rare. A fundamental morphological variety occurred at the *Loranthus* species. The varieties of qualitative characteristics can be ascertained in the course and characteristic of the colpus, in case of *Longaxones*.

The intraspecific morphological variations have a great significance in the exact knowledge of sporomorphs. In this respect, the results connected with the trilete spores and the Gymnosperm pollen grains with bladders (KEDVES 1961; MARTIN 1961) are to be mentioned. In case of the Angiosperm pollen grains this problem is less investigated, as yet, there were only published a few data (VAN CAMPO 1961, 1973, 1976; STOCKMARR 1970; KÖNIGSSON 1971).

We have performed light-microscopical examinations on the pollen grains of a very large number of recent Angiosperms. In the course of these investigations, we took precious good care of the qualitative morphological variations. We came generally to the following conclusions.

1. The Angiosperm pollen grains are in respect of their qualitative traits comparatively permanent, some variety manifests itself primarily in size, resp. in the measurable characteristics.

2. In certain cases, there are obvious qualitative varieties, as well, but between these species no evolutionary connection can be established. The qualitative variation may appear in different branches of the development of the Angiosperms. It is probably an atavic phenomenon, a remainder of the obviously great variational disposition of the primitive ancestors.

As to the single variations, we have established the following types and set examples for these:

1. Numerical variation at certain characteristics, in particular cases the change in the number of germinalia. This question is most known primarily in case of the pollen grains of *Brevaxones*.

2. The variation of the fundamental morphology of the pollen.

3. The qualitative variation of a characteristic which is essential from the point of view of characterizing the pollen.

4. The lack of an essential characteristic of the pollen grain as a variation phenomenon.

1. The numerical variation of the germinal pore is frequent enough in case of *Brevaxones*. At *Longaxones* it is rare, particularly at the tricolporate pollen grains. We have observed the tetracolporate variation of a pollen grain of this type in case of *Cassia artemisioides* (Plate, 3, 4).

2. A fundamental morphological variation was observed in more than one *Loranthus* species. From among these, *L. platyphyllus* and *L. acaciae* are to be mentioned. For the pollen grains of this type in the genus some ancestral peculiarities may be established. Namely, their morphology, in polar aspect, is very similar to the *Complexiopollis* fgen. which represents one of the most ancient types of the *Brevaxones* pollen grains. This is interesting in itself, in case of the *Loranthus* species, following a special course in life, so much the more because — according to JARZEN and NORRIS (1975) — the genus *Macrosolen* (Loranthaceae) is similar to the species of *Aquilapollenites* (cf. ERDTMAN 1971). In this way, the two main types of the ancient Angiospermatophyte pollen grains (*Normapolles*, resp. *Aquilapollenites*) equally show some morphological similarity with Loranthaceae. In the cases investigated the triplan form is extremely frequent (Plate, 7, 8, 11, 12) which is similarly an ancient characteristic, a variation of the extreme concave ancient forms. The pollen grains of this type were originally described in the *Latipollis* fgen. by KRUTZSCH (1959). This taxonomy was later taken over by several authors. GÓCZÁN, GROOT, KRUTZSCH and PACLTOVÁ (1967) recognized that the *Latipollis* type was a variation phenomenon and divided the here classified species into the genera, recognized in the polar aspect. In this respect we have so far not known a corresponding recent variation phenomenon. It is probable that in this case the point in question is convergence.

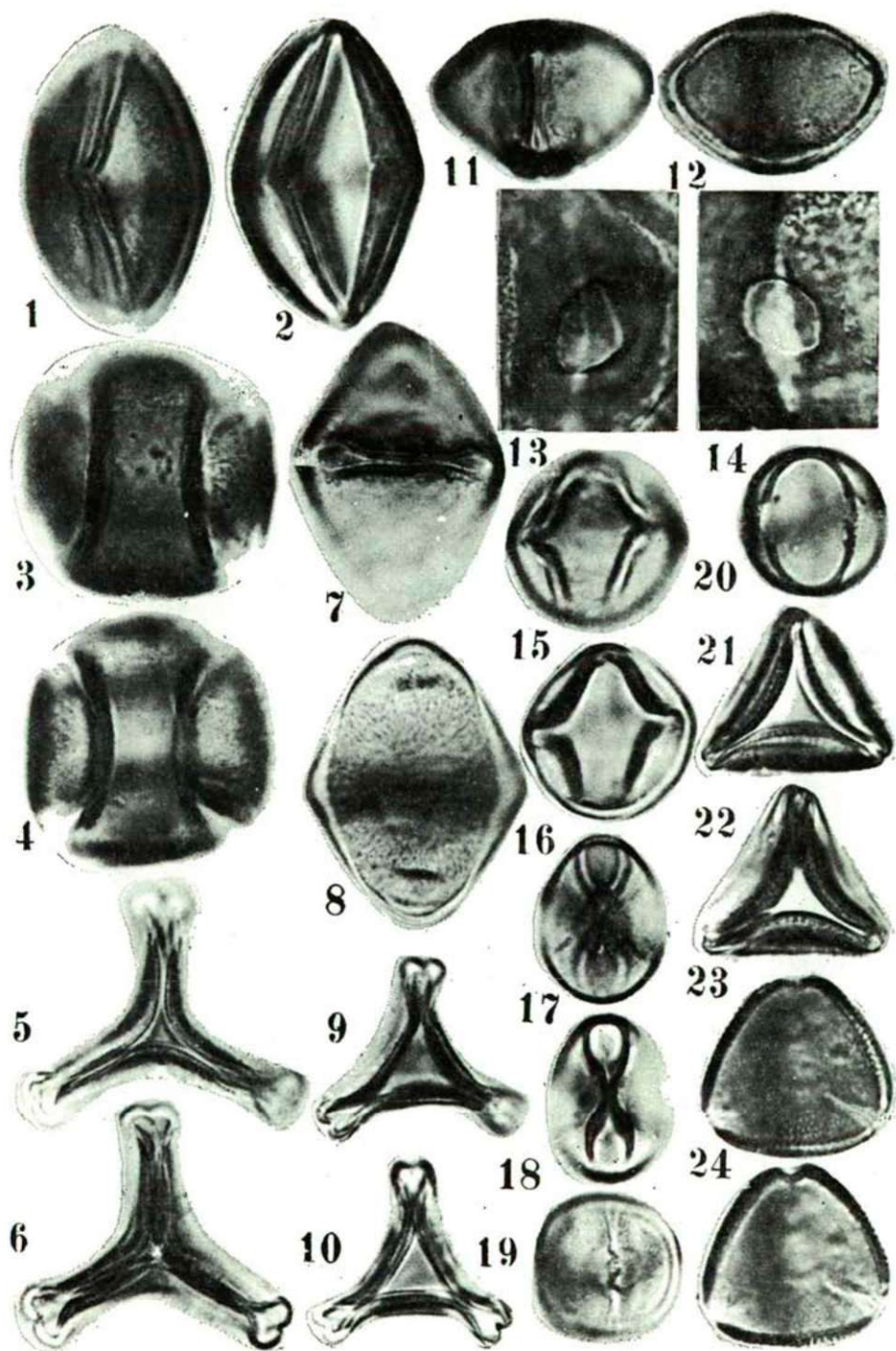
3. There are published here two data concerning the qualitative variation of a characteristic.

We have observed the numerical variation of the partly short colpi of the *Alangium platanifolium* (Plate, 13, 14). 3 colpi: 41 per cent, 4: 57 per cent, 5: 2 per cent. According to ERDTMAN's book (1952), this is characteristic of the single species of the genus. The exine of the species investigated is thick enough, particularly the nexine. This surrounds the endogerminalia with a characteristic caverna (Plate, 13). In some extreme cases this can be missing (Plate, 14).

PLATE EXPLANATION

- 1, 2 *Cassia artemisioides* GAUD. Tricolporate, typical pollen.
- 3, 4 *Cassia artemisioides* GAUD. Tetracolporate form, in polar view.
- 5, 6 *Loranthus platyphyllus* HOCHST. ex A. RICH., polar aspect, typical form.
- 7, 8 *Loranthus platyphyllus* HOCHST. ex A. RICH. Form of "Latipollis type".
- 9, 10 *Loranthus acaciae* ZUCC., typical form, in polar aspect.
- 11, 12 *Loranthus acaciae* ZUCC. Form of "Latipollis type".
- 13, 14 *Alangium platanifolium* HARMS. Details from the fine structure of colpi.
- 15, 16 *Clethra alnifolia* L.
- 17, 18 *Trichodesma africanum* (L.) R. BR. var. *abyssinicum* BRAND, typical form.
- 19, 20 *Trichodesma africanum* (L.) R. BR. var. *abyssinicum* BRAND, casually occurring form.
- 21, 22 *Comandra pallida* A. D. C., typical form.
- 23, 24 *Comandra pallida* A. D. C., casually occurring form

N: x1000



At the tricolporate pollen grains the course of the colpus may often be decisive even from the point of view of identification and it is a remarkable characteristic in any case. Such is, for instance, the pollen grains of the Cyrillaceae, Clethraceae, and Theaceae genera. We are publishing, for instance, the typical pollen of *Clethra alnifolia* (Plate, 15, 16) where the declination of colpi in the direction of the equator has proved to be a constant character. The contrary of this, the convergence of colpi, gives the characteristic of the *Trichodesma africanum* var. *abyssinicum* pollen (Plate, 17, 18). We have, however, observed at this species, if rather rarely, so-called colpi of regular course, as well (Plate, 19, 20). At fossil investigations the deviation like this is today already rather intergeneric than interspecific.

4. The pollen grain of *Comandra pallida* is very interesting, with certain peculiarities that are characteristic of the ancient *Brevaxones* (Plate, 21–24). The arcus-like formations of its typical forms, reaching from apex till apex, are characteristic. In case of a few specimens this characteristic is entirely missing (Plate, 23, 24). This morphological difference is followed in case of fossil forms by essential taxonomical consequences.

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