

POLLEN MORPHOLOGY OF AMPHICARPAEA (LEGUMINOSAE: PHASEOLEAE)

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This study concerns itself with the determination of the pollen characteristics of the members of the genus *Amphicarpea*. Based on the external morphology of the members of the genus *Amphicarpea*, Turner and Fearing (1964) regarded the genus as consisting of three valid species, *A. africana* (Hook.) Harms., *A. bracteata* (L.) Fern. and *A. edgeworthii* Benth. Each of these species exists on a different continent, *A. africana* from Africa, *A. bracteata* from North America, and *A. edgeworthii* from Asia. It was also pointed out that *A. bracteata* and *A. edgeworthii* are often quite difficult to distinguish based on external characteristics.

MATERIALS AND METHODS

The pollen samples were prepared using the standard acetolysis method devised by Erdtman (1952, 1960). The filtration of pollen was performed during the first washing after acetolysis. The pollen grains were mounted in glycerin and sealed with paraffin.

RESULTS

The pollen grains of *Amphicarpea africana*, *A. bracteata* and *A. edgeworthii* were found to exhibit distinctly different characteristics. All species had spherical grains, but differed with regard to texture of the sexine and colpi-ora characteristics. Pollen characteristics of specimens previously identified as *A. comosa* were also examined and found to have pollen characteristics identical to *A. bracteata*.

The pollen characteristics for the three species of *Amphicarpea* are as follows:

A. africana (Fig. 1)

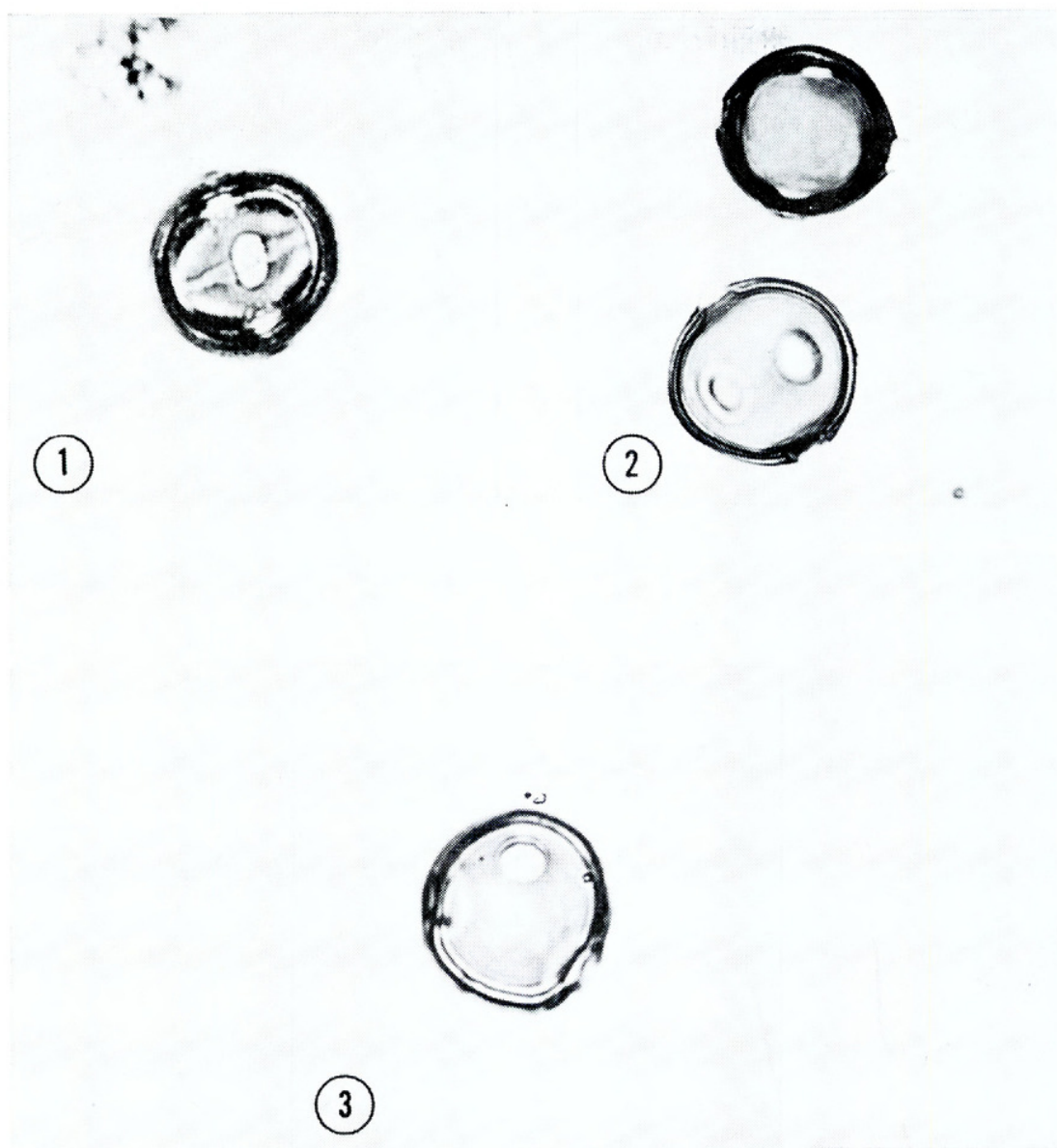
Spherical, tricolporate, zonotrene ora, reticulated sexine, blending into smooth regions near the colpi, diameter ca. 30μ . (Uganda: Taylor 2845, ISC; Tanzania: Richards 24654, NY)

A. bracteata (Fig. 2)

Spherical, tetraporate, zonotrene ora, smooth sexine, ora slightly raised or lipped, diameter ca. 28μ . (U.S.A.: Demaree 16228, SMU; Kral and Godfrey 3562, SMU)

A. edgeworthii (Fig. 3)

Spherical, triporate, zonotrene ora, smooth sexine, ora slightly raised or lipped, diameter ca. 28μ .



Figs. 1-3. 1. Pollen grain of *Amphicarpaea africana*. Note reticulation and colpora. X 1600. 2. Pollen grain of *A. bracteata*. Note number of pores. X 1600. 3. Pollen grain of *A. edgeworthii*. Note number of pores. X 1600.

(Japan: Charette 1401, MO; Kirkino 24104-364, SMU)

DISCUSSION AND CONCLUSION

The pollen grain morphology supports the results obtained by Turner and Fearing (1964). There are only three distinct species of *Amphicarpaea* based on pollen morphology. In regard to the relationship of these three species, it could be hypothesized that *A. africana* possesses pollen most similar to

that of the precursor of the genus because it possesses a primitive tricolporate grain with a reticulated sexine. The other species, *A. bracteata* and *A. edgeworthii*, appear to be modifications of this basic form by loss of the colpi and reticulated sexine and an increase or retention in the number of pores. This supports the statement made by Turner and Fearing (1964) that *A. africana* is "a very distinct species being more distant from *A. edgeworthii* and *A. bracteata* than the latter taxa are from each other." In fact, the external characteristics of *A. bracteata* and *A. edgeworthii* are so similar that Turner and Fearing (1964) stated: "The taxa are almost identical and even the technical characters listed in the key to the species often fail to place an occasional specimen. If it were not for their continental isolation, the taxa would probably have been treated at no more than varietal rank." Although the pollen shows similar characteristics for these species, it also indicates that they are distinctly different.

On the basis of pollen morphology, the species can be distinguished as follows:

- | | |
|---------------------------------------|-----------------------|
| 1. Pollen tricolporate | <i>A. africana</i> |
| 1. Pollen porate. | |
| 2. Pollen tetra-pentaporate | <i>A. bracteata</i> |
| 2. Pollen triporate | <i>A. edgeworthii</i> |

Using the pollen characteristics in conjunction with the external morphology, the members of the genus *Amphicarpaea* can be definitively identified.

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