

and flower a few days earlier than the normal plants (with normal rooting system) of the same race. "Rootlessness" is also recorded in some teosinte races as discussed above.

U. C. Banerjee
E. S. Barghoorn

6. Identification of pollen grains of maize: importance of size.

Recently we have studied (Banerjee and Barghoorn, MGCNL 44, 1970) the differences existing among pollen grains of maize and its relatives, using scanning and transmission electron microscopy. The use of better resolution and high magnification electron micrographs further helps in precise identification using micro-morphological characters of pollen grains. However, earlier reports from this laboratory clearly suggest that pollen grain size (outer diameter at pore axis) alone could be used safely to distinguish maize pollen from that of its relatives. Maize has the largest pollen grain size so far recorded among grasses (up to 150 μ in some cultivated varieties of maize). At this stage we suggest that any pollen grains of grasses larger than 100 μ present in the sediments can be safely interpreted as maize, if the pollen shows an evenly distributed granular exine pattern with the light microscope (LM). Moreover, accurate measurements of pollen grain size are only possible with the LM. So the use of the LM still has great potential in maize palynology. If LM phase-optics or a high quality oil-immersion objective is used one can distinctly recognise the granular nature of exine (spinulate ectexine pattern) of maize and teosinte pollen from the negatively reticuloid exine pattern of Tripsacum species pollen. Problems arise when the predominantly smaller pollen grains of some cultivated maize varieties (especially of popcorn races) fall within the size range of teosinte pollen. In these cases the use of electron microscopy is essential. Recently, we have found that the pollen grains of some popcorns and teosinte among some wild populations exhibit an ectexine spinule dimorphism at the ultrastructural level which makes it very difficult to separate the two genera. The cause of such an ectexine spinule dimorphism and variation in pollen grain size, due to various environmental factors in both maize and teosinte, is under investigation.

U. C. Banerjee
E. S. Barghoorn