BOTANY

Chairman: Charles L. Gehring, Department of Life Sciences, Indiana State University, Terre Haute, Indiana 47809

Leland L. Hardman, Department of Biology, Ball State University, Muncie, Indiana 47306 was elected Chairman for 1974

ABSTRACTS

Early Development of Anthers in the Maize Mutant, Tassel Seed-2. Charles Felling and Charles L. Gehring, Department of Life Sciences, Indiana State University, Terre Haute, Indiana, 47809.—— Anther development of the maize mutant tassel seed-2 (heterozygous state) was studied by light and electron microscopy. Anther development from locule formation to premeiotic prophase was divided into five reasonably distinct developmental ranges and locule lengths were determined. Stage one locules (50-150 microns) consist of central meristematic (archesporial) cells and an epidermal layer. In stages two (150-300μ) and three (300-600μ), the hypodermal cells give rise to the primary parietal and primary sporogenous cells; the former then give rise to the endothecium and parietal layers. Anther wall formation is completed during stage four (600-1300μ) as the parietal layer gives rise to middle and tapetal layers. Callose deposition begins around the sporogenous cells as they enter meiosis at stage five (1300-2300μ). The large sporogenous cell nucleoli contain prominent 'nucleolar vacuoles' throughout development. Two nucleoli per nucleus are frequently seen at stage two, occasionally at stage three, but have not been observed at the later stages. Starch (which is never present in the sporogenous cells or the adjacent cell layer during development) progressively increases both in number and size of grains in the outer cell layers and becomes particularly prominent in the endothecium. At early stages all locule cell walls are uniformly thin. By stage three the periclinal walls of the endothecium have greatly thickened. The other cell walls remain thin, though they differ in structure (middle and tapetal walls are extraordinarily thin and the anticlinal epidermal and endothecial walls are 'wavy'). Plasmodesmata traverse all cell walls throughout development. Organelles typical of meristematic plant cells were present in all tissues.

Ultrastructure of Plastid Entities in Cells of Genetic Albino Leaf Callus of Phenotypically Green Origin. Anne A. Susalla, Department of Biology, Saint Mary's College, Notre Dame, Indiana 46556.——Young tobacco callus cells from genetic albino leaf tissue of phenotypically green origin have plastid entities unlike those found in mature leaf cells of similar origin. Plastid entities in callus cells are variable in shape and may contain invaginations enclosing cytoplasm and organelles. A prolamellar body is occasionally observed but thylakoids have not been identified. The plastid membrane is observed to be diffuse in some

areas, even though membranes of nearby organelles are intact. Tubular and vesicular structures that appear to be part of a peripheral reticular system are present in marginal areas of the stroma. Starch grains are commonly present.

A Robust Form of *Echinochloa muricata*. D. JAMES MORRÉ, Department of Botany and Plant Pathology, Purdue University, West Lafayette, Indiana 47907.——A robust form of barnyard grass, *Echinochloa muricata* (Beauv.), was collected in early September 1973, on the west bank of the Wabash River between Mascouten Park and the river (Indiana Highway 43 North) in Tippecanoe County, Indiana. The plants were in the late stages of anthesis and growing in association with typical forms of *E. muricata* and *E. crus-galli* (L) Beauv. Six specimens were obtained from a single colony of about 12 plants. The culms were erect or decumbent at the base, stout, succulent, up to 1 centimeter in diameter, branched, and over 2 meters tall. The leaf sheaths were glabrous; blades elongate, 20-25 millimeters wide, and scabrous above. The panicles were erect or nodding, deep purple to purple-tinged, and 15 to over 40 centimeters long. Racemes were spreading, ascending, or appressed, the lower as much as 12 centimeters long, mostly branched with 10-20 primary branches. The spikelets were crowded, 3.5 millimeters long excluding the short awns. Internerves were glabrous and the nerves were strongly tuberculate. The fertile lemmas lacked the ring of minute hairs below the tip to distinguish the spikelets from those of *E. crus-galli*. The second glume and sterile lemma had mostly pustular bristles, a characteristic of *E. muricata*. Awns were variable, mostly 1.5 to 2.5 millimeters long, up to 5 millimeters long, up to 5 millimeters long on some of the spikelets. Except for their unusually large size, the specimens could not be distinguished from a short-awned form of *E. muricata*.

Robust forms of Green Foxtail (*Setaria virdis* var. *robusta-purpurea* Schreiber and *S. virdis* var. *robusta-alba* Schreiber) have recently invaded Indiana and present a serious new weed menace. A robust form of *E. muricata* could be equally serious if established in Indiana's bottomland fields.

Spore Viability in a Fifty-one-Year-Old Sporocarp of *Marsilea quadrifolia*. WILLIAM W. BLOOM, Biology Department, Valparaiso University, Valparaiso, Indiana 46383.——A sporocarp of *Marsilea quadrifolia* collected in 1922 was germinated in the summer of 1973. Seventy-two of 73 megaspores produced female gametophytes and many of the microspores produced functional male gametophytes. Seventy-one of the female gametophytes gave rise to sporophytes.