have a low percentage of teosinte plants well distributed throughout the field which are partially seasonal isolated from maize. The $F_1$ hybrids are earlier than teosinte and therefore hybridize with maize, resulting in a greater abundance of backcross progeny than $F_1$ hybrids.

| | Sample Area | Number of Plants Total (Maize & Teosinte) | Teosinte | % Teosinte / Maize | $F_1$ | Mbc |
|---|---|---|---|---|---|---|
| Teosinte not abundant - $F_1$ hybrids less frequent than backcrosses | | | | | | |
| Cuitzeo, Michoacan | 5/8 acre | 10,622 | 129 | 1.2% | 2 | 8 |
| Teosinte abundant - $F_1$ hybrids more frequent than backcrosses | | | | | | |
| Uriangato, Guanajuato | 1/2 acre | 2,493 | 473 | 19% | 9 | 1 |

The Tripsacum present in and around these fields belong to the T. lanceolatum group. Field-collected clones from the study areas are being maintained for crossing studies in the Maize Relatives - Genetic Garden of Tulane University.

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1. Malate dehydrogenase in maize endosperm.

A. Intracellular Localization

Multiple molecular forms of malate dehydrogenase have been demonstrated in numerous animal and plant tissues and the existence of isozymes appears to be the rule. The endosperm of Zea mays L. has been examined with regard to the presence of this enzyme and several isozymes have been detected using acrylamide gel electrophoresis. Studies have been concentrated on the two isozymes which migrate most rapidly toward

the anode and make up the bulk of the total activity of the enzyme. By using isopycnic or equilibrium density centrifugation, these two major isozymes have been separated and their particulate associations determined. The isozyme which migrates most rapidly toward the anode during electrophoresis is mitochondrial in origin while the second major isozyme is associated with a microbody which resembles the glyoxysomes (peroxisomes) reported in other plant tissues. The microbodies have been observed under the electron microscope in both sections of endosperm and in homogenates. They are membrane bound, 0.5 to 1.0$\mu$ in diameter, and contain most of the catalase present in the tissue. Homogeneous preparations of these major isozymes have been obtained using anion-exchange chromatography and their physical and kinetic properties are now under investigation. The remaining isozymes detected in this tissue appear to be soluble or cytoplasmic in origin and together make up a small fraction of the total activity.

B. Changes in Isozyme Pattern During Endosperm Development

Changes in the isozyme pattern of malate dehydrogenase have been studied in developing maize endosperm. The plants used were a single cross ($\underline{su}_1/\underline{su}_1$) hybrid, "Seneca 60". Endosperm was obtained from selfed plants and was harvested from 2 to 20 days after pollination at two day intervals. The endosperm from individual kernels was excised and homogenized in buffer. The resulting homogenate was filtered and used directly for acrylamide gel electrophoresis. Two isozymes were detected in the unfertilized ovule and in the endosperm up to eight days after pollination. These corresponded to the particulate isozymes mentioned in part A, which are associated with the mitochondria and glyoxysomes. From the tenth to the fourteenth day following pollination at least three other isozymes appeared. They migrated more slowly toward the anode and, as evidenced by their staining intensity on the gels, were not present in as high a concentration as the two major particulate isozymes. It appears that all the slower travelling forms are soluble or cytoplasmic in origin. No further changes in isozyme pattern were detected following the fourteenth day after pollination.

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