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1. The present center of diversity of the genus *Tripsacum*

The widespread distribution of *Tripsacum* species in the Western Hemisphere suggests an ancient origin of the genus, but new species apparently are continuing to evolve among groups of populations in different habitats from near sea level to altitudes of about 2500 meters in Mexico, Guatemala and neighboring regions. Elsewhere throughout the range of the genus from Mexico northward to the northcentral and northeastern United States and from Central America southward in South America to southwestern Brazil and Paraguay populations are more uniform, discontinuities and habitat preferences are more apparent and species are more definitely delimited.

At the periphery of the present distribution of the genus diploid species are predominant and the taxonomic status of the limited number of known tetraploids is about as uncertain as elsewhere. In South America the diploid *T. australe* is widely distributed and an essentially glabrous, undescribed variant is well established on the western slopes of the Colombian Andes. Triploidy and tetraploidy are represented in South America by *T. laxum*, introduced for forage from Central America and the Caribbean about 35 years ago, and by tetraploid populations of uncertain affinities in Ecuador and Venezuela. In the United States a diploid form of *T. dactyloides* occurs from Texas northward to Kansas and there are tetraploids some of which may be autopoloids of *T. dactyloides* and others that are sparsely distributed along the East Coast from southern Florida to Connecticut have the appearance of being relatively recent introductions from south of the Mexican border or the Caribbean. Four tetraploid species (*T. lanceolatum*, *pilosum*, *latifolium* and *laxum*) have been described from Mexico and Guatemala, and in 1950 two very unlike diploid species (*T. maizar* and *zopiloteense*) were described from the state of Guerrero, Mexico by Hernandez and Randolph (Ofic. Estud. Espec. de Mexico, Fol. Tec. 4).

From my field studies of 1963 and 1965 in collaboration with Professor Hernandez, other distinctive tetraploid populations in addition to those that have been given species names, and six additional localities for the diploid *T. maizar* as well as four reproductively isolated populations of *T. zopiloteense* in the Canada del Zopilote and one near Tepic have been discovered. Mixed populations including types resembling *T. maizar* and morphologically variable tetraploids have been identified at Acahuazotla and Aguacate in the state of Guerrero and at Tepic and Oblatos Agua-Caliente in Jalisco. From these recent discoveries it has become increasingly obvious

that the present center of diversity of the genus *Tripsacum* is in southwestern Mexico and adjoining areas as previously suggested by Randolph and Hernandez (*Genetics* 35:668, 1950).

L. F. Randolph

2. Cytogenetics of speciation in *Tripsacum*.

There are many well known examples of species with the tetraploid number of chromosomes that apparently have arisen by hybridization of distantly related diploid species followed by chromosome doubling. Such allopolyploid species are essentially true-breeding because of the synaptic incompatibility of the chromosome sets of the parental species and lack of gene exchange between them at both the diploid and tetraploid levels. But the possibility that a series of tetraploid species might arise by chromosome doubling following the hybridization of two closely related but phenotypically very unlike diploid species having chromosomes sufficiently compatible to pair regularly and exchange genes freely seems not to have been generally recognized as a potentially significant evolutionary process. It is just these conditions, however, that appear to explain most satisfactorily the occurrence of extremely variable tetraploid populations of *Tripsacum* widely dispersed in Mexico and Central America, of which four types have been described as species (*T. lanceolatum*, *laxum*, *pilosum* and *latifolium*) and others appear to be equally deserving of specific or sub-specific status as they complete the process of acquiring adequate discontinuity and other essential attributes of definitive taxa.

There are only two diploid species of this region that combine most of the characteristics found among the tetraploid populations of this and neighboring areas: *T. zopilotense* and *T. maizar*. The former is a small, grass-like essentially glabrous plant with slender, sparsely branched culms usually less than a meter in height and with a single or rarely two terminal spikes, narrow flaccid leaves less than a cm. in width; staminate spikelets in pairs, one sessile. The latter is a robust very pubescent plant, corn-like in general appearance with thick culms branched at upper nodes, up to 4.5 meters in height; leaves 7-10 cm. wide; tassels with as many as 45-50 branches of which the staminate portion is much longer than the pistillate; staminate spikelets in pairs of which one is sessile the other pedicellate; a plant of rich moist soils, in sharp contrast to the habitat preference of *T. zopilotense* for the poorer soils of rocky, arid slopes. The pachytene chromosomes of *T. maizar* have few if any conspicuous knobs; those of *T. zopilotense* have numerous terminal and intercalary knobs. Although differing phenotypically in many traits these two species are cross-compatible and their chromosomes pair fairly regularly in the diploid F_1 hybrid (Prywer, Bolet. Bot Soc Mexico 28:11-18, 1960). Among the