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Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

THE TAXONOMY OF ZEA MAYS (GRAMINEAE)

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The origin of maize has long been disputed. Of the various theories, the oldest postulates its direct origin by ancient human selection from a wild grass of the genus *Euchlaena*, the "Teosinte" of Mexico and Guatemala; i.e. maize is simply regarded as a highly domesticated and variable cultivar of *Euchlaena*. The morphological steps, first clearly outlined by G.N. Collins (J. Agr. Res. 17: 127-135. 1919), were discussed but not accepted by P.C. Mangelsdorf (Bot. Mus. Leaflet. Harvard Univ. 12: 33-75. 1945) and amplified by W.C. Galinat (An. Rev. Gen. 5: 447-478. 1971) and myself (H.H. Iltis The Maize Mystique. 5 pp. mimeo MS. 1970; cf. Galinat, loc. cit. pp. 450, 462). The genetic reasons were first outlined by G. Beadle (J. Hered. 30: 245-247. 1939).

The close relationship of *Euchlaena* to *Zea* was taxonomically formalized by Reeves and Mangelsdorf (Am. J. Bot. 29: 815-817. 1942), who transferred its two accepted species to *Zea*. Of these, the perennial tetraploid *Z. perennis* is the most primitive and distinctive in the genus. The diploid annual *Z. mexicana sensu lato*, however, contains two major elements: the *Tripsacum*-like, more primitive "Florida" Teosinte (*E. luxurians*) from Guatemala, which does not cross as readily with maize and other Teosinte forms, and which deserves separate subspecific status (see below); and the remaining races (cf. H.G. Wilkes, Teosinte: the closest relative of Maize. Bussey Inst. Harvard. 158 pp. 1967) which cross with close to 100% fertility with maize, and are best considered, for the time being, under but one subspecies, conspecific with maize as suggested by C.D. Darlington (Chromosome Botany. Allen and Unwin, London. pp. 130-131. 1956):

"The breeding and chromosome evidence ... agree in requiring that *Euchlaena mexicana* and *Zea mays* should be described as one species, the wild grass being today an authentic and scarcely changed representative of what the ancestor of *Zea mays* must have been."

The new combination, made informally by Iltis (loc. cit.), was validly published in Galinat (loc. cit. p. 450), who, however, neglected to cite the basonym date and place of publication, an oversight rectified below. Further study may in addition demand separate subspecific recognition of other *Zea mays*.

races, especially the "Rio Balsas" and "Chalco" populations. (cf. Wilkes, loc. cit.).

Synopsis of Zea

1. Zea mays L. ssp. mays
2. Zea mays L. ssp. mexicana (Schrad.) Iltis, in Galinat, An. Rev. Gen. 5: 450. 1971.  
(based on Euchlaena mexicana Schrader, Index Sem. Hort. Goett. 1832; Linnaea 8: 25. 1833).
3. Zea mays L. ssp. luxurians (Durieu) Iltis, stat. et comb. nov.  
(based on Euchlaena luxurians Durieu, Bull. Soc. d'Acclimat. 19: 581. 1872).
4. Zea perennis (Hitchcock) Reeves et Mangelsdorf.  
(based on Euchlaena perennis Hitchcock).

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To J. B. Van Schaack - Amazinging!  
The Maize Mystique - A Reappraisal of the Origin of Corn.

Hugh H. Iltis<sup>1</sup>

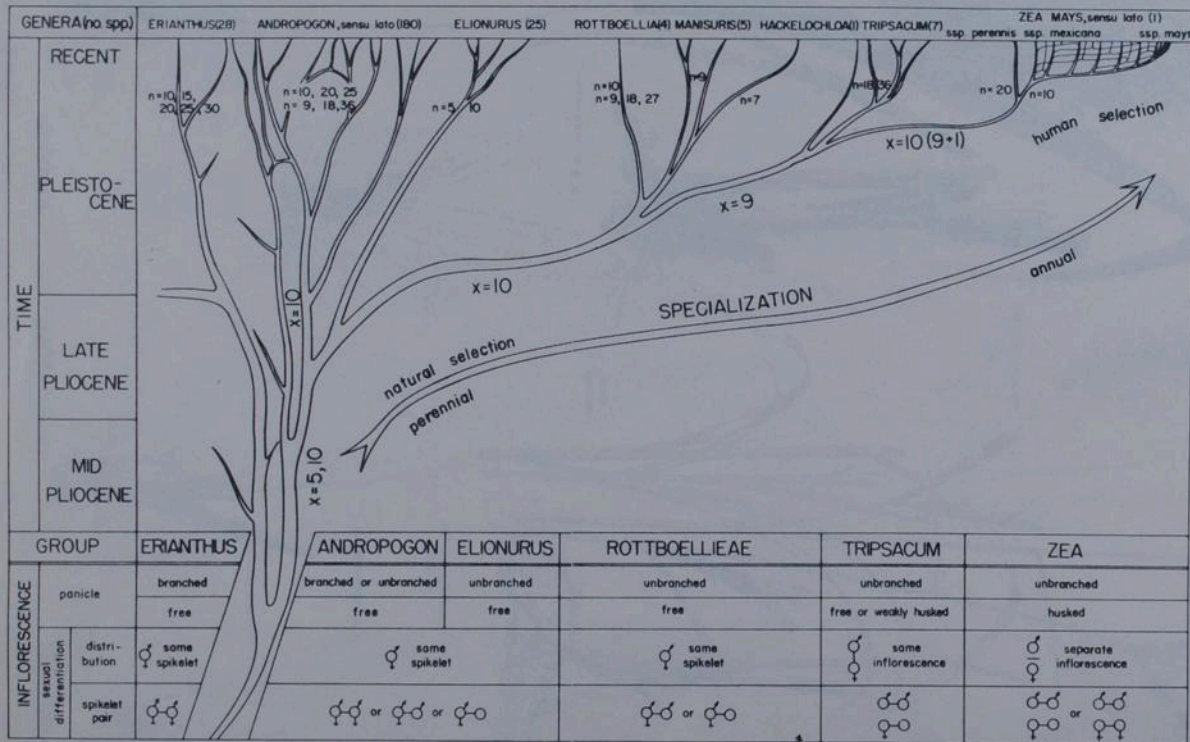
Abstract

Corn is domesticated Teosinte (Euchlaena mexicana, sensu lato), differing not at all in any of its basic vegetative, floral, or genetic attributes. All the unique peculiarities of corn are concentrated in the structure of the female inflorescence, the corncob, and all can be easily interpreted as the result of human selection for human needs for more food: for greater quantity, and for greater, more efficient harvestability. Thus, compared with wild Teosinte, the increase in the volume of harvest sub-units, namely in grain size, in grain number through activation of aborted spikelets and aborted florets, in row number and in cob length were all selected for by primitive man to produce more food. The decrease in the number of primary harvest units (the female inflorescences) to one or two giant, apically dominant, terminal inflorescences per plant, the coordinated protection of these inflorescences by many husks, these liberated from their old function of protecting the many, now suppressed, lateral cobs, and the change from a fragmenting, disarticulating rachis (cob axis) and rachilla to one that is shatterproof, were all selected for by primitive man to increase the ease and efficiency of harvesting. In addition, the reinforcement in the corn plant of Teosinte's annual habit and of a single, gigantic stem are likewise due to human selection. The resulting cultigen is easily grown, easily harvestable and abundantly yielding.

The domestication steps of corn outlined above are analogous to what has happened in the evolution of other crops. Thus, the reactivation of the sterile pedicillate spikelet of a pistillate pair (and even the occasional reactivation of the sterile, aborted floret of each spikelet) are analogous to the reactivation, again by human selection, of the two lateral sterile spikelets of a "triplet" in barley (Hordeum vulgare). The giant monocephalic terminal corn cob derived by suppression of the many tiny lateral female inflorescences found in a fertile Teosinte branch and the stout strong single stem of corn are analogous to the monocephalic head and stout single stem of the cultivated sunflower, Helianthus annuus var. macrocarpus, which makes one think of corn as a graminoid "sunflower".<sup>2</sup> In these two crops, and in most cultivated grains, increase in both size and number of harvest sub-units (Heiser 1951), as well as in the complexity and size of the primary harvest unit itself, are both very prominent, trends that are replicated in the series from Teosinte through popcorn to modern maize. All these three crops are cultivar analogues, artifacts of man's selection, triumphs of the human ability to turn weedy annuals into high-yielding crops.

<sup>1</sup> Department of Botany, University of Wisconsin, Madison. Lecture presented at Iowa State University, Ames, December 18, 1970.

<sup>2</sup> The common name of the sunflower in N. Mexico is "Maiz de Tejas", i.e. flat corn. (Bukasov, in Mangelsdorf and Reeves 1939).



Hugh Iltis 1969  
(Drawn by Ted Cochran)