On comparison of the plastid extract chromatogram and the methanol extract chromatogram, it was determined that the flavonoids were the same in both samples. The paired chromatograms were analyzed under ultraviolet light, color changes in ammonia vapor noted, and the flavonoids eluted for spectrophotometric measurements (Table 3).

Table 3. Comparison of leaf and chloroplast flavonoids of Zea mays.

Compound number*	Identity	Leaf	Chloroplast
1	Kaempferol 3-monoglycoside	+	+
4	Vitexin	+	+
5	Flavonol 7-monoglycoside	+	+
6	Flavonol 7-monoglycoside	+	+

+ present

* corresponds to the compounds in Table 1 which are fully characterized

Recent research has shown that flavonoids are not end-products but are continuously synthesized and degraded in healthy tissues. The above evidence indicates that flavonoids are most likely synthesized within the chloroplast and transported to the vacuoles in most cells. It had been thought in the past that flavonoids were stable end-products of metabolism stored in the vacuole and thus removed from enzymatic activities associated with plant growth, differentiation, etc. It appears that this older view must be seriously questioned.

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Allotaxis in maize — We use the word "allotaxis," with the same value as "heterotaxis," to express in a general way that the plant material stands aside from the common or normal arrangement, such as the modifications in a maize stock reported by us on other occasions (IV Jornadas de Genética Luso-Espanholas, Oeiras, Portugal, 1967; Port. Acta Biol. 10: 289-300, 1968; An. Aula Dei 10: 716-723, 1969). This material is not only of the aberrant phyllotaxy type reported by Greyson and Walden (Amer. J. Bot. 59: 466-472, 1972), but also includes more

complicated types, not possible to consider only as modifications of phyllotaxis. Aberrant phyllotaxy could then be referred to as allophyllotaxis, an individual case of general allotaxis.

Determinations of length, width and area of leaves, height of plant and length of internodes, and number of nodes, leaves and ears, have been made in normal distichous plants of maize and in corresponding plants with allotactic modifications. Comparing decussate material (De) with distichous material (Di), the ratio De/Di results in different values depending on the character. The ratio is lower than 1 (De/Di = 0.75) for length of internodes and height of plant and for length, width and area of leaves. The ratio is near 1 (De/Di = 1.01) for mean number of nodes. The ratio is higher than 1 for the features total blade area per plant (De/Di = 1.28), total number of leaves per plant (De/Di = 2.03) and number of potential ears per plant (De/Di = 3.21).

There is an apparent positive correlation between length and area of leaves. The width of leaves tends to a constant value, different for distichous and for decussate material.

With increasing number of nodes and leaves, there follows a corresponding decrease in the length of leaves and the area of leaves. This fact may be considered as a natural tendency of the plant to hold its physiological stability irrespective of its apparent phenotype. The normal distichous phenotypes studied here have a practically constant total leaf blade area. In contrast, the decussate phenotypes, while positively correlated with the number of nodes, present rather important variability in the total leaf blade area, which signifies a different capability for trapping sunlight energy. One may conclude, therefore, that physiological stability for decussate material may be reached at a level different from that of distichous material.

The normal distichous plant seems to have reached its best equilibrium for height, as indicated by a constant length of internodes. Yet the decussate plant seems to be potentially operative, as indicated by the variable length of internodes. The distichous phenotype with opposite leaves has a potentiality similar to decussate plants.

The different behavior of phenotypes is displayed in the first stages of the living plant, at least as far as the current increase of the number of leaves is concerned. However, some defective characters dealing with shortness of the stem are not expressed until more advanced developmental stages have been reached.

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