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1. "Flower-pot technique" as a new method for mutation induction on maize pollen.*

Use of induced mutations in corn breeding has been rather limited mainly because of:

a) enormous genetic variability already present in this allogamous plant and

b) scarcity of efficient mutagenic treatments giving clear-cut results.

Ethyl methane sulfonate (EMS), a powerful and very efficient mutagenic agent on cultivated plants, has been usually employed in many species by soaking seeds in an aqueous solution and then applying a genetic analysis to the M_2 or M_3 generations, originating from M_1 plants produced by treated seeds, in order to pick up eventual mutants.

We tested a new method which we named "flower-pot technique". Immature male inflorescences from an inbred line (flint type) were kept at room temperature in the laboratory. Peduncles were put into Erlenmeyer flasks and immersed either in bidistilled water ("control") or in freshly prepared EMS solution (0.2 per cent in volume) ("treated"). About three days later, and after anthesis, pollen was collected.

At the beginning of treatment, the pollen stage varied from interphase between first and second mitosis in tassel branches to nearly mature pollen grains in the central axis and at the end of treatment after thirty-six hours, from late second mitosis to mature pollen grains, respectively.

Crosses were made with the two types of pollen ("control" and "treated") using another inbred line ("opaque-2") as female. Seeds produced were considered as the M_0 generation from the treatment.

In the M_1 generation arising from "treated" pollen a wide range of types, colors, sizes and patterns of grains were recorded, completely different from those of parental types or those found with "control" pollen. The M_2 observations confirmed previous results.

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Though the data are incomplete and the results are only partially analyzed, it can be stated that this is an interesting technique because of its simplicity and efficiency. Its apparent advantage over other methods could be due to its operation during differentiation of the pollen grain (haploid phase) as opposed to many conventional techniques which perform during the diploid phase, under diplontic selection pressure.

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1. Possible nontunicate to Tunicate mutations.

Mangelsdorf and Galinat in their paper on "The tunicate locus in maize dissected and constituted" (PNAS 51:147-150, 1964) state that if their genetic analysis of the Tu locus is valid, Tu "cannot occur as a mutant in modern commercial nontunicate maize".

This note is to record four cases in which Tunicate ears have appeared in commercial corn. The first to come to my attention was sent to me by Midwest Research Associates about a decade ago. Dr. Bruce Ashman, Purdue University, found a Tunicate ear near Madison, Wisconsin about 1960. A third Tunicate ear was found at Macdonald College, near Montreal, in 1968 in a five acre increase block of the open pollinated land-variety Quebec No. 28. The most recent find occurred as two ears in a Foundation seed increase of Funk Seeds International near Bloomington, Ill. in 1972.

There is no sure way of knowing if these Tunicate ears resulted from mutation of tu to Tu or whether they resulted from "blow-in" pollen the previous generation. All of the mutants except that from Ashman still exist in my cultures and they will be analyzed to determine if they are different in some way from the standard Tu allele. Should they be different, this would suggest a mutant origin. Seed is available for distribution.

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