

3. New sources of cytoplasmic pollen sterility.

Two new sources of cytoplasmic pollen sterility have been isolated from the race Perla, being identified in breeding plots, and checked by testcrosses, with known restorer and non-restorer lines. These 2 sources have been named EM-3000 and EM-320, and their behavior is as follows:

- EM-3000: (a) completely restored by FF(MS) 14-2
 (b) not restored by either Cuba M11-20##-9 or Cuba M11-3##
 (c) restored 3:1 by HLM-24## -3 and by MSx (T-115xKy-122)
- EM-320: (a) completely restored by FF(MS) 14-7-2 and PD(MS) 9 - 32
 (b) not restored by PD(MS) 9-48 derived lines.
 (c) restored 3:1 by FF(MS) 14-2-## - derived lines.

Both sources behave with these lines identically as does the Texas source of cytoplasmic pollen sterility.

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4. Inheritance of Cap.

The simple dominant gene hypothesis has been confirmed to operate in the character starchy cap vs. no cap in crosses of Cuban dent lines x Peruvian Perla flint lines.

In the cross PC-79-## x Cuba 23-25## (no cap vs cap) a 1:1 phenotypic ratio was obtained in the F₂, while in the F₂ of three families of the cross PD(MS)9-48##x CC-94## (cap vs. no cap) a 33:4 phenotypic ratio that approaches a hypothetical 7:1 was obtained. Both ratios point to a single gene segregation with two modes of xenia operation: completely dominant xenia (7:1) and incomplete dominant xenia (1:1) in the endosperm.

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5. Study of chromosome morphology of races of maize in Peru.

Advances have been made in the study of the number, position, size and shape of chromosome knobs of the races of maize in Peru, trying to determine patterns for differentiating races (see first report in Maize News Letter 32:25).

Differentiating features have been obtained, and are being studied further for ample confirmation, in the frequency of appearance of knobs in certain chromosome arms, the shape and size of such knobs, the frequency of presence of the abnormal -10 chromosome, and the frequency of high number of B-chromosomes. The highest number of B's per plant, found

so far, was 4. Generally speaking, B - chromosomes are found in high-land races, with low number of knobs.

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6. Evidence for existence of a common prehistoric race in both North and South America.

A new cache of corn in an early Paracas stratum (circa 0-200 B.C.) was found by Dr. Dwight Wallace in Ica, on the southern Peruvian coast. This material, was found in an excellent state of preservation and permitted a careful morphological study. The ears were short, ranging from 1.5 to 9.0 cms. in length, most of them with medium to strong fasciation with brown or red pericarp, and small yellow flinty (pop) kernels. Four ears had cherry pericarp.

This corn is clearly related to a precursor of a large number of present-day Peruvian and Andean races, and the Mexican race chapalote seems to be similar to Huaca Prieta corn, as well as to corn from Tularosa Cave, which would mean, that this prehistoric race of corn might have been grown in both North and South America, more than 2500 years ago.

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1. A persistent nucleolus in maize.

A study of meiosis was made in 6 F_1 plants from a cross between a normal inbred line and a plant with the constitution abnormal $10\ 10^B\ 2p^{ab}10$. In all plants a persistent nucleolus was detected at both meiotic divisions in a large number of pollen mother cells. Parallel production of carmine stained nucleolar-like bodies was also observed in many cells.

A large number of droplets of staining material were found in the nucleus, surrounding the chromosome threads at leptotene. At zygotene similar droplets were observed in close connection with the synzygetic knot. Large, irregular, light staining spots were observed in the surrounding nuclear sap. These spots are thought to be the products of the progressive dissolution of droplets previously formed and freed by the chromosome contraction into the synzygetic knot.