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1. New endosperm mutant tentatively designated opaque-4.

An opaque phenotype endosperm mutant has been isolated from an "exotic" composite. Negative allele tests have been obtained with du, h, bt_1, bt_4, o_1, o_2 and ae. Also, it does not show the floury phenotype dosage effect. Analyses show that it is normal in amylose level and in lysine content.

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2. Induced mutation rates produced by treatments with four alkylating agents to the proembryo of Zea mays L.

The study reported here involves the use of seedling marker genes Lg_1 and Gl_2 at positions 11 and 30 in the short arm of chromosome 2 and Yg_2 at position 7 in the short arm of chromosome 9 as a system of testing and comparing the mutagenicity of ethyl methanesulfonate (EMS), diethyl sulfate (DES), ethylenimine (EI), and diepoxybutane (DEB) treatments applied to the proembroyos of maize.

Homozygous lg_1 gl_2, Yg_2 C Sh_1 Bz Wx female stocks were crossed with homozygous Lg_1 Gl_2, yg_2 c sh_1 bz wx male stocks. The proembryos 24 and 48 hours after pollination were treated with 20 ml solutions of one of the four alkylating agents. The treatment concentrations for each of the agents were as follows: EMS-0.2, 0.1, and 0.01653M; DES-.045M; EI-0.2, 0.1, and 0.05M; and DEB-0.01, 0.005, and 0.0025M. As a control, deionized glass-distilled water was used. All solutions were freshly prepared in deionized glass-distilled H_2O at pH 6.4 with phosphate buffer. The proembryos were prepared by carefully making a longitudinal incision in the ear shoot, plying back the husks from the ear sufficiently to allow one to wrap absorbent cotton around the ear. The ear shoots were soaked with the treatment solutions and covered with a bag. The cotton swab was allowed to remain for 2 hours and then it was removed. The ear was thoroughly washed with deionized glass-distilled H_2O, the husks were closed back around the ear and held by rubber bands and the ear was covered with a bag.

The mature ears were scored for genetic losses of partial and whole endosperm and seedling markers and are shown in table 1. This communication reports only the results of the pooled genetic losses of seedling markers. The mutant phenotypes were scored in seedling material from the first through the sixth leaf stage. Many seedling mutation events were also scored as very minute streaks of recessive tissure in addition to those partial events which were 1/2, 1/4, 1/8, 1/16th part of the seedling leaf.