

fertile chimeras when they first make their appearance. There is some indication that both cytoplasmic and nuclear fixations of the male-fertile element are involved in individual chimeras. If this is confirmed in more extensive studies it will add strong support to the episome hypothesis.

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2. Sensitivity of pollen with Texas group male-sterile cytoplasm to *Helminthosporium maydis* race T pathotoxin.

The reaction of maize pollen carrying T or P male-sterile cytoplasm to the presence of *Helminthosporium maydis* race T pathotoxin in the germination medium has been reported previously (MGCNL 47: 49, 1973; Crop Science 13: 681, 1973). Pollen germination and growth are inhibited in the presence of the race T pathotoxin. Smith *et al.* (Crop Science 11: 772, 1971) have reported that plants carrying T, P, Q or HA male-sterile cytoplasm are susceptible to *H. maydis* race T. These four cytoplasm are members of the Texas group of male-sterile cytoplasm (Beckett, Crop Science 11: 724, 1971). Gracen (Plant Disease Repr. 55: 938, 1971) has reported that RS male-sterile cytoplasm, found at Cornell in 1967, is also susceptible to race T.

We have studied the reaction of pollen of these five susceptible male-sterile cytoplasm carried in the two inbred lines NY821LERf and AyX187Y-2, to the race T pathotoxin. These inbred lines, with normal cytoplasm, and their five restored Texas group male-sterile versions were kindly provided by Dr. V. E. Gracen. Concentrations of race T pathotoxin which allow normal growth of pollen grains from NY821LERf and AyX187Y-2 inbred lines with normal cytoplasm inhibit germination and growth of pollen grains from the T, P, Q, HA and RS restored male-sterile versions of these two lines.

The T, P, Q, HA and RS male-sterile cytoplasm were identified in different and, so far as we are aware, unrelated strains of maize, and each is associated with enhanced susceptibility to race T of *H. maydis*. As noted above, race T pathotoxin inhibits germination of pollen from plants carrying these sterile cytoplasm. This would seem to indicate that the susceptibility and the male sterility associated with these

cytoplasms are the result of a single alteration in the cytoplasm rather than the result of two independent genetic defects. In other words, there is no evidence that the Texas-type cytoplasmic male sterility can exist separately from sensitivity to H. maydis race T and to its pathotoxin.

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3. Growth of pollen from various inbred line and F<sub>1</sub> sources on Cook and Walden basal medium.

In the course of studies on the reaction of germinating maize pollen to Helminthosporium maydis pathotoxins (MGCNL 47: 49, 1973; Crop Science 13: 681, 1973) many inbred lines and their different cytoplasmic versions were tested along with some F<sub>1</sub> hybrids. As one of the controls in these studies, we used the Cook and Walden basal medium (CWBM) (Can. J. Bot. 43: 779, 1965), the only modification being an increase in agar content from 0.7 to 1.0%. It was noted that inbred lines vary widely with respect to growth of pollen tubes on CWBM. Since information on the performance of inbred line pollen may be of use to those studying the physiology of maize pollen or other phenomena involving pollen germination, we report here the relative performance of 30 inbred lines in classes ranging from poor to excellent.

Eight inbred lines were noted to have excellent pollen germination on CWBM: W23, Mo17, CI21E, Oh51A, N6, Hy2, C103, and B14. Pollen germination of six inbred lines was good: 38-11, NY821, AyX187Y-2, CE1, Oh43 and A632. Eleven lines exhibited satisfactory pollen germination on CWBM and, while they were not outstanding, they could certainly be used in pollen germination studies: SK2, R138, Ky21, B37, Oh07, Tr, N28, K4, K61, N28 and A619. Pollen from five inbred lines tested grew poorly on CWBM; WF9, W64A and Oh545 gave consistently poor germination while M14 and K55 varied somewhat but usually grew poorly.

The three commercially available F<sub>1</sub> hybrids, C123/C103, B37/B14A and A619/Oh43, gave good to excellent pollen tube growth on CWBM. While pollen grains obtained from F<sub>1</sub> hybrid plants vary in genotype, these sources may nevertheless be useful for some studies.