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Fungicide-resistant of os
mutants of Neurospora crassa

We are investigating mutants of Batrytis cinerea and N. crassa that are resistant to various antifungal chemicals. Mutants selected on media containing the agricultural Fungicide, vinclozolin, are cross-resistant to other "dicarboximide" and "aromatic hydrocarbon" fungicides. Most of the mutants (which we have designated Vin) grow poorly on Vogel's minimal medium MM, and on media supplemented with chemicals that cause a marked increase in the osmolarity and/or the supply of ammonium ion.

The sensitivity of vin mutants to high osmotic pressure is paralleled by the osmotic mutants described by Mays (Genetics 1969, 63: 781) and by Murayama and Ishikawa (J. Bacteriology 1973, 115: 796). We have characterized a selection of these osmotic mutants to determine whether they are resistant to some dicarboximide (procymidone, iprodione and vinclozolin) and aromatic hydrocarbon (chloroneb, dicloran and quintozone) fungicides. The data (Table 1) show that os-1, os-2, os-4, os-5 flm-1 (= os-1 and flm-2 (= os-4) mutants are resistant to the fungicides, but cut and gla mutants are not. The phenotypes (i.e. rates of growth on MM and supplemented MM, and levels of resistance to the fungicides) of the os mutants are as variable as those of our Vin mutants. With a few exceptions, os-1 mutants can be distinguished from os-2, os-4 and os-5 mutants by their lower growth on MN, their higher resistance to the fungicides, and their greater sensitivity to media supplemented with amino acids or NaCl

Preliminary genetic studies of our vinclozolin-resistant mutants of N. crassa indicate that this phenotypic character is specified by numerous genes; most of the Vin genes seem to be located on chr I, but we have detected few Vin mutants that are clearly allelic with os-1 os-4 or os-5.

Osmotic mutants can be isolated and identified with ease on media containing any of the fungicides listed in Table 1. We use commercial fungicides which are supplied as wettable powders (e.g. "Ronilan", supplied by BASF United Kingdom Ltd., contains 50% vinclozolin; the fungicides are added to cool, sterilized media.