

Aflatoxin-Producing *Aspergillus flavus* in Hawaii

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ABSTRACT

OOKA, J. J., and M. S. ZUBER. 1980. Aflatoxin-producing *Aspergillus flavus* in Hawaii. Plant Disease 64:550-551.

A 1978 survey of maize in Hawaii resulted in discovery of aflatoxin-producing strains of *Aspergillus flavus* and *A. parasiticus* in ears and kernels collected from fields on one of the major Hawaiian islands.

Aspergillus flavus Lk. ex Fr., a wound pathogen of maize (*Zea mays* L.) (9,11), is able to produce aflatoxins before harvest (6,7) as well as in storage (5). Recent work by Zuber et al (12) indicated differences in aflatoxin levels among hybrids involving several common maize inbred line parents. Because Hawaii does not permit introduction of *A. flavus* cultures, aflatoxin-producing strains of the fungus needed to be found in Hawaii so that maize lines could be tested for resistance to aflatoxin contamination.

Journal Series No. 2441 of the Hawaii Agricultural Experiment Station, Honolulu 96822.

Supported in part by Contract AID/TA-C 1451, University of Missouri.

0191-2917/80/06055002/\$03.00/0
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MATERIALS AND METHODS

Maize ears or kernels were collected from 11 fields in Hawaii. Six fields were on Molokai, two each on Kauai and Hawaii, and one on Maui. An effort was made to select ears with symptoms resembling those from *A. flavus* infection. A random sample of 20-40 kernels from each ear and 50-100 kernels per shelled sample were disinfected for 1 min in 0.5% NaOCl, blotted dry, and placed on malt-salt agar (3) containing 7.5% NaCl. After 7-day incubation at 28 C, the kernels were examined for yellow-green *Aspergillus* conidial heads. Mass transfers of conidial heads were made to *Aspergillus* differential medium (4). The colonies that developed cadmium yellow pigment in the medium after 3-day incubation at 28 C were transferred to 10% V-8 juice medium (8) for maintenance and propagation.

Ground rice cultures of the *A. flavus* isolates were assayed for aflatoxin as recommended (2).

RESULTS AND DISCUSSION

The sample of 77 moldy ears and 128 kernel lots from 11 locations netted five cultures that produced the required cadmium yellow pigment on *Aspergillus* differential medium. All these cultures came from different ears collected in a field at Waimea, Kauai. Only four cultures produced aflatoxins. Two produced aflatoxins B₁ and B₂ and were identified as *A. flavus*. The other cultures produced aflatoxins in both the B group and G group and were considered to be mixtures of *A. flavus* and *A. parasiticus*.

This is the first report of aflatoxin-producing strains of *A. flavus* and *A. parasiticus* from maize grown in Hawaii. Considering the southerly location of Hawaii (1,10) and the normally high level of insect activity (1,6,7), recovery of *A. flavus* and *A. parasiticus* from only one of 11 fields was less than anticipated (7). The occurrence of a aflatoxin-producing species of *Aspergillus* may, however, allow for screening for resistant inbreds in Hawaii.

ACKNOWLEDGMENTS

We wish to thank E. B. Lillehoj and his staff at the Northern Regional Research Center, SEA-USDA, Peoria, IL, for aflatoxin analyses of these five *Aspergillus* cultures.

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