DISTRIBUTION AND CHARACTERISTIC OF ZEARALENONE-PRODUCING FUSARIUM IN MAINLAND CHINA

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INTRODUCTION

The genus *Fusarium* and the diseases of crops by *Fusarium* are common and widespread in the world. Some species of *Fusarium* have been well known as producers of zearalenone, an estrogenic mycotoxin (ref. 1-2). Since 1928, the oestrogenic syndrome in swine has been reported in many countries, such as U.S.A., Austraria, Canada, Denmark, France, Hungary, Italy, Japan, Mexico Romania, South Africa, U.K., the USSR, Yugoslavia and Zambia etc. (ref.3-5). In China, similar symptoms in swine occurred in suburbs of Shanghai in 1973 and in Guizhou province in 1977. Zearalenone was obtained from the feeds (ref. 6). It was also reported that *F. graminearum* BAU-Z₈, isolated from the mould corn in 1973, produced copious amounts of zearalenone on rice or corn medium (ref.7). Different comments have been made on the temperature of biosynthesis of zearalenone (ref.1,7-8). Does the difference in comments depend on regions or species of *Fusarium*?

This paper reports the distribution of zearalenone-producing *Fusarium* in Mainland China and discusses the effect of temperature on the ability to produce zearalenone.

MATERIALS AND METHODS

79 Samples of unprocessed grains, including corn, wheat, barley, oat, rice, broad bean, soybean, sorghum and pea, were collected from 29 provinces, autonomous regions and cities directly under the Central Government in Mainland China during 1984-1988. After the treatment with sodium hypochlorite the grains were plated on PDA and stored at about 24 C and 10 C separately. 330 strains of *Fusarium* from the grains were grown on rice medium and incubated under alternating 24 C-10 C-24 C temperatures for six weeks. The cultures were extracted with ethyl acetate and detected on HPTLC by Shimadzu chromatogram with fluorescent detector. The strains producing zearalenone were identified in the light of Booth system, Nelson et al. system and Gerlach et al. system (ref.9-11).

RESULTS AND DISCUSSION

According to the identification, zearalenone-producing *Fusarium* in Mainland China mostly was *F. graminearum* which took 86.6% of

the total. The rest were *F. equiseti*, *F. culmorum*, *F. avenaceum*, *F. semitectum*, *F. compactum* and *F. crookwellense*. No strains of *F. moniliforme* tested produced zearalenone.

49.7% of the tested strains produced zearalenone. The range of yield was from 0.48 to 5143.4 mg/kg of rice. 36.7% of the tested strains had the ability to produce zearalenone at about 24 C, without lower temperature, with the highest yield 1132.2 mg/kg of rice. After the treatment of lower temperature, 62.3% of the tested strains obviously enhanced zearalenone production, 25.3% did not cause change in production, while 12.3% noticeably reduced production.

This reveals that for most strains the low temperature is not essential for biosynthesis of zearalenone. The optimum temperature for producing zearalenone varies with the strains of *Fusarium*, probably having no concern with regions and media.

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