

ACCUMULATION OF AFLATOXINS IN RICE IN RELATION TO
PROCESSING AND STORAGE IN SRI LANKA

BY

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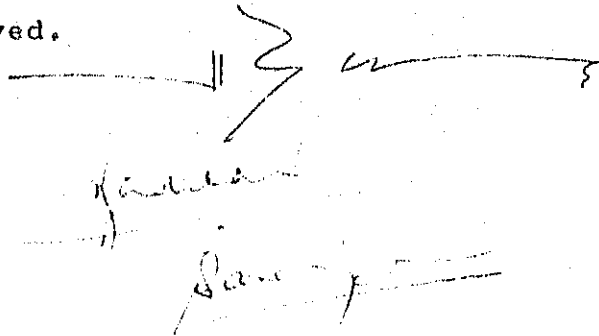
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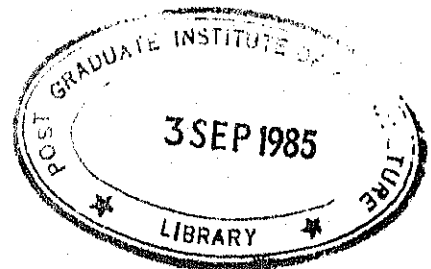
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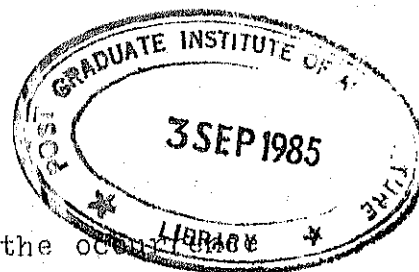
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ABSTRACT

An extensive survey was done on the occurrence of aflatoxins in parboiled rice and raw rice in major rice producing areas and consuming townships in six selected districts. Total of 485 samples were analysed for aflatoxin B₁ and G₁ by TLC (thin layer chromatography) or liquid column chromatography.

All raw rice samples collected from Colombo, Nuwara Eliya and Jaffna districts were free of aflatoxins while in two other districts, number of toxic samples were less than 10 percent (10%). The highest mean aflatoxin content was observed in rice samples collected from Anuradhapura district. The aflatoxin B₁ content in parboiled rice was significantly higher than that of raw processed rice.

Preferential infection of parboiled rice by Aspergillus flavus and A. parasiticus was observed. Aflatoxin content in rice produced by commercial parboiling was higher than that of household parboiled rice. As the duration of soaking increased, increasing aflatoxin content was observed while addition of sodium hypochlorite to soaking water appreciably reduced A. flavus contaminations and subsequent aflatoxin content in parboiled rice.

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Brownish, greenish or mouldy rice with fermented odour contained over 1000 $\mu\text{g}/\text{kg}$ aflatoxin B_1 . The clean and odourless samples had aflatoxins below 50 $\mu\text{g}/\text{kg}$ of aflatoxin B_1 . In all samples aflatoxin B_1 content was lower than G_1 .

The intensity of surface microflora and aflatoxin content in market samples of rice were closely related.

Polishing before storage may be helpful in reducing aflatoxin content. However polishing of contaminated rice did not sufficiently reduce aflatoxin B_1 levels.

Black grains and split grains not only reduced the quality but also carried high aflatoxin content. Hence parboiling process should be adapted in a way not to allow them to split, such as hot soaking suggested by Bandyopadhyay and Roy (1977) or mechanical method used in Rice Processing Development Centre (RPDC), Anuradhapura.

Cooking did not reduce the aflatoxin content in rice while removal of buoyant in salt water may assist in reducing it.

When hospital records of liver diseases were analysed it was true that there were more cases of liver diseases in

males than in females. This was true even in male juveniles. In Kandy 33% of deaths due to liver diseases were young males, suggesting the importance of liver toxic substances other than alcohol.

Considering the other factors which vary from district to district such as alcoholism, rice consuming pattern, reliability of hospital survey data and educational standards of the people, there seem to be a higher frequency of non-alcoholic liver diseases in Kandy and Anuradhapura than in Colombo and Galle.

