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SOLAR DETOXIFICATION OF AFLATOXIN B1 IN OILS OF DIFFERENT VISCOSITY AND ACIDITY

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An inexpensive, simple process is available today[1] for detoxification of aflatoxin contaminated coconut oil by solar irradiation. The application of this principle to other oils was examined with sesame, soya, rubberseed and coconut (refined and unrefined) oils.

The oils were artificially contaminated with aflatoxin B1 (1µg/ml) and were exposed to solar radiation at midday for 10 - 30 minutes at a static layer thickness of 1.6 mm. The oils, before and after exposure, were spotted on Silica Gel G thin layer chromotographic plates, developed with diethyl ether followed by 3% methanol in chloroform and were examined under ultraviolet light at 365 nm.

After irradiation for 10 minutes, there were no aflatoxin B1 or fluorescent degradation product of aflatoxin B1 in soya, sesame, and coconut oils. In rubberseed oil, no degradation of aflatoxin B1 was observed. The viscosity and acidity of rubber seed oil were 1303 (Redwood No. 1) and 8.2 (as % acetic acid) whereas other oils showed viscosities of 181 - 267 and acidities of 0.03 to 2.3 respectively.

On diluting the rubberseed oil with chloroform and ethanol separately, in the ratio of 1:1 and 1:2 to viscosities 40 and 30 respectively, no degradation of aflatoxin B1 was observed on irradiation. On changing the acidity at constant viscosity of 30, degradation of aflatoxin B1 was observed below 1.8% and no degradation was observed above 2.2%

Aflatoxin B1 in soya, sesame and coconut oil could be degraded with solar irradiation. Acidity of the soil appears to play an important role in the degradation reaction.

Reference

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