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MODULATION OF ANTIMUTAGENIC RESPONSE DETECTED IN AFRICAN *BAMBARA* GROUNDNUT

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Introduction: *Bambara* groundnut (Vigna subterranean) commonly eaten in Central and Southern Africa region where the incidence of gastric and liver cancer is high because of the consumption of contaminated food by mycotoxins, has been investigated for antitumorigenic activitly using the classical Ames test with some modifications.

The mechanism involved in the antimutagenic response observed can be depicted by different treatments of *Salmonella* bacteria with mutagen and antimutagen compounds with or without microsomal activation.

Methods: Two grinded samples of *bambara* groundnut (Black and White species) were first extracted with in 75℃ water and then in 80% ethanol. After removing pigments with chloroform, aqueous and ethanol mixture was extracted with ethyl acetate. Antimutagenic activity was evaluated against Daunomycin as a mutagen by different types of incubation with *Salmonella typhimurium* strain (TA102) reversion test and expressed as modulation index (% of inhibition for each of three types of treatments): pre-treatment (4th incubation: bacteria+modulator), co-treatment (20 min incubation: bacteria+modulator+mutagen) and post-treatment (60 min incubation: bacteria+mutagen). Antimutagenic potency was also expressed as a dose inhibiting 50% of mutagenicity (IbD_{50}) inferred from dose-reponse curves.

Results: Pretreatment of Black groundnut-ethylacelate extract (BGE) with bacteria before addition of mutagen has shown a greater modulation index of 62% and 26% for the doses of modulator (antimutagen) of 16 and 33 mg respectively, corresponding to the extent of intracellular reactions involving in the bacteria cell carrying rfa mutation and conferring a greater protection against the mulagen than the White groundnut-ethylacetate extract (WGE), 39% and 1.8% respectively for the

above mentioned doses.

IbD_{50} were 52 and 67 mg/plate in 4h pretreatment liquid incubation for BGE and WGE respectively whereas higher amount of antimutagen were required in 20 min co-treatment with a mutagen (>120 mg/plate) to exhibit a substantial antimutagenic activity for both groundnuts.

While a strong inhibition (modulation index: 67% for 16 mg/plate) has been observed in BGE in co-treatment experiment, WGE exhibited only a weak modulation index (1.4%) which could not discriminate the contribution of intracellular from extracellular mechanism. However, due to the high modulation index observed in 60 min post-treatment procedure (incorporation of mutagen into the bacteria cell before adding modulator), the two types of African groundnut could be considered as biomutagens, both inducing possible direct or late effects on DNA repair system.

Conclusion: To fully understand the mechanism involved in the modulation of this African groundnut in the specific antimutagenic response against specific carcinogens (i.e. benzopyrene, aflatoxin, fumonicin...), additional *in vitro* experiments using S9 activation with other *Salmonella typhimurium* strains and *in vivo* animal experimental models are needed. It is only in this way that we could recommend the extensive use of these rich protein food-stuffs in the diet for reducing the incidence of these particular types of cancer.