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Effects of fermentation on the nutritional properties of sweet orange seeds (*Citrus sinensis*), on albino rats

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The fermentation, physicochemical properties and the effect of fermented orange seed (*Citrus sinensis*) on albino rat was investigated. Fresh seeds of *Citrus sinensis* were fermented for four days and the microbial population for the fermentation was determined using standard microbiological techniques. Temperature, pH and total titratable acidity were determined during fermentation. Proximate composition of the sweet orange seeds was determined before and after fermentation. Fifteen rats were fed with dried, fermented and grinded orange seeds after 2 weeks of acclimatization. The microbial population of bacteria was between 2.36×10^8 cfu/ml to 3.10×10^8 cfu/ml and 2.5×10^3 sful/ml to 4.0×10^3 sful/ml for fungi during fermentation, three different bacteria were identified which include; *Serratia marcescens*, *Bacillus subtilis* and, *Bacillus cereus*. Four species of fungi were also found to be associated with the seeds; these include *Aspergillus flavus*, *Aspergillus niger*, *Aspergillus fumigatus* and, *Articuloseora inflata*. Moisture content was $12.78 + 0.06b$ mg/100g for the fresh sample and dried was $10.45 + 0.08a$ mg/100g. Ash, fat content, and crude protein before fermentation were $0.24 + 0.04a$, $10.92 + 0.06a$, $3.12 + 0.11c$, $9.55 + 0.04a$ respectively, 96hrs of fermentation has the highest moisture content, crude protein, and fat content, with $56.15 + 0.30c$, $14.50 + 0.50a$, and $19.33 + 0.05a$ respectively, while 24hrs fermentation have has the lowest moisture content, ash, fat content and, crude protein, with $12.75 + 0.06b$, $0.46 + 0.01b$, $11.67 + 0.08b$, and $10.08 + 0.07a$ respectively. The pH during fermentation of the seeds showed that highest pH was 4.60 on the first day and 5.14 on the third day. On feeding the rats with fermented orange seeds they all lost weight. Each Rat that was fed on 24 hours of fermentation whose initial weight was 90.68g decreased to 85.00g, after on the fourteen days the liver has was observed with some necrosis and fatty infiltration. The results suggested that dried orange seeds can be used as supplement for obesity patient.

Biography

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