820/E2

Jackfruit seed flour in biscuit making technology: Analysis on product qualities

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Jackfruit (*Artocarpus heterophyllus* Lam.) is one of the most popular tropical fruit crops grown in Asia. Jackfruit seeds are a good source of dietary fibre, protein and resistant starch. A study was carried out to investigate the feasibility of partially replacing wheat flour with jackfruit seed flour in biscuit making technology. Dried jackfruit seeds were processed into wet milled flour and used to supplement wheat flour, in the percentages of 0, 5, 10, 15, 20 and 25 for biscuit production. The nutritional composition, sensory evaluation and microbiological quality were evaluated. The nutritional qualities such as moisture, ash, protein, fat, fibre, and total soluble carbohydrate of the biscuits were analyzed. When the proportion of the jackfruit seed flour increased from 0-25%, the protein, fibre and ash contents increased from 12.86 to 13.5, 0.82 to 1.95 and 2.90 to 4.36% , respectively whereas the moisture content decreased from 4.95 to 3.20%. The findings of microbial studies showed that no total plate counts were observed in the developed biscuits. The sensory evaluation showed that jackfruit seed flour supplemented biscuits were significantly different ($p<0.05$) from whole wheat biscuits with respect to the sensory attributes such as colour, crispiness, flavour and overall acceptance at all levels of jackfruit seed flour supplementation. In organoleptic assessment, the mean scores for the assessed sensory characters decreased with increase in the jackfruit seed flour blend. From the overall acceptance rating, 20% jackfruit seed flour supplemented biscuits obtained the highest preference compared to other combinations. Based on nutritional and organoleptic qualities, 20% jackfruit seed flour supplemented biscuits can be used for biscuit production with the overall consumer acceptance.

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821/E2

Carbon dioxide trapping capacity of the N,N'-ethylenebis(acetylacetoniminato) Nickel(II) hemihydrate complex

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N,N-ethylenebis(acetylacetoneiminato)Nickel(II) hemihydrate complex was synthesized by using template synthesis and characterized using single crystal X-ray analysis, UV visible spectroscopy, cyclic voltammetry and FTIR techniques. The CO_2 trapping capacity was studied with a Vernier CO_2 gas sensor which is capable of measuring the transmitted amount of CO_2 (in ppm) from a sample within specific period of time (in seconds). At room temperature, the complex shows ~ 35% more CO_2 absorption than the starting material, nickel acetate and the absorption capacity is not sensitive to the amount of complex present. When the temperature goes down to 4-5 °C the CO_2 absorption depends on the amount of complex present in the medium showing about 50% more CO_2 absorption than nickel acetate of the same concentration. The presence of new bands around 2900 cm^{-1} in the FTIR spectra of solid samples of the complex after passing CO_2 provides clear evidence for the trapping of CO_2 by the complex.

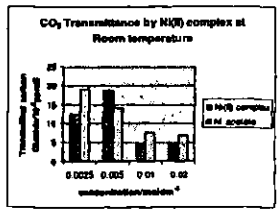

Fig.1 CO_2 transmittance by the various Concentrations of Ni(II) complex at RT.

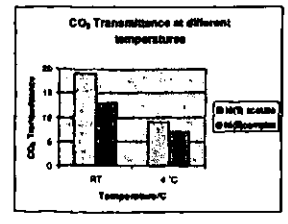

Fig.2 CO_2 transmittance for 0.0025 M solutions at RT and 4 °C

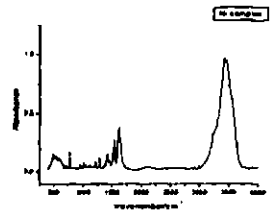

Fig.3 FTIR spectrum of synthesised Ni (II) complex before passing CO_2

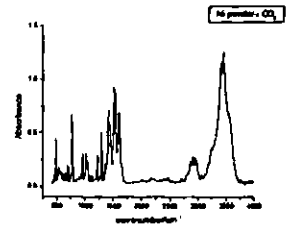

Fig .4 FTIR spectrum of Ni(II)complex after passing CO_2

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Bioactive metabolites from a species of *Aspergillus* isolated from soil

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Two important fungal metabolites are antibiotic penicillin and the popular cholesterol lowering agent, lovastatin. A fungus isolated from a soil sample associated with roots of the plant *Suaeda maritima* collected from the Puttalam District was used in this research. By studying colony characters, fungal morphology and asexual reproductive characters, the fungus was identified as a species of *Aspergillus*. A pure culture was grown in Potato Dextrose Broth for 21 days and extracted into methanol followed by separation with ethyl acetate to obtain low molecular weight compounds. Crude EtOAc extracts in MeOH were used to determine antibacterial activity against *Bacillus* sp, *E. coli*, *Staphylococcus* sp. and *Klebsiella* sp. using the Kirby-Bauer method. Discs were prepared by absorbing 10 µL of methanolic solutions containing 500 µg of extract and pure MeOH for negative control. A disc containing 25 µg of Amoxicillin was used as a positive control. All assays were conducted in duplicate and the average diameters of clear zones were recorded. Crude EtOAc extract showed 18.25 mm clear zone against *Bacillus* sp., while 18.5 mm clear zone against *Staphylococcus* sp. In the positive control, Amoxicillin gave 12.5 mm and 31.75 mm clear zones respectively for the same two bacterial cultures. Results indicate the presence of strong antibacterial constituent/s in the extract.

The fungus was grown on a large scale in PDA as it was found to be the best medium for growth and bioactivity. The crude EtOAc extract of the fungus was partitioned between hexane and 80% aqueous MeOH. The MeOH fraction was then diluted with water to prepare a 50% aqueous MeOH solution and partitioned with dichloromethane (DCM). All fractions were bio-assayed against *Bacillus* sp. Active compounds were found to be concentrated mostly in the DCM fraction and the hexane fraction. The DCM fraction was chromatographed over a column of sephadex LH 20. Bioassay results revealed that the bioactivity is concentrated in the fractions eluted with DCM : hexane 4:1, and DCM : acetone 3:2. Isolation of the bioactive constituents by further fractionation of active fractions is under way.

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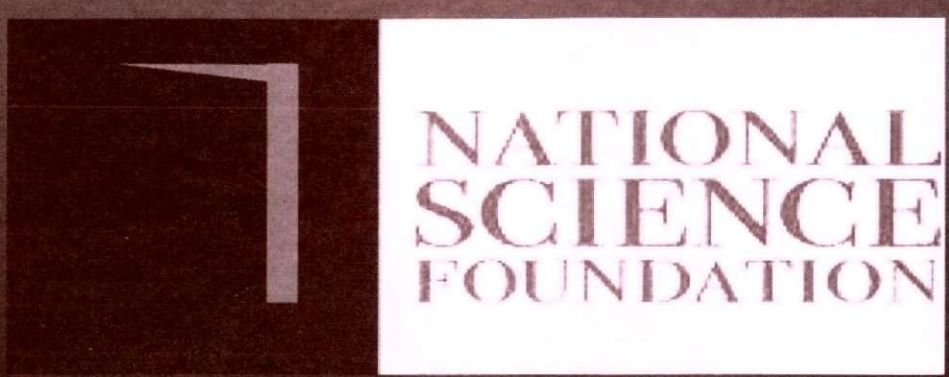

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