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performed using the Minimal inhibitory concentration (MIC) method. Phytochemical screening revealed the presence of alkaloids, tannins, reducing sugars, flavonoids, cardiac glycosides and steroids. With the use of GCxGC- TOF MS analysis over 100 compounds were identified of which fatty acids such as Oleic acid, 9-Octadecenoic acid (Z)-,methyl ester, Hexadecanoic acid, methyl ester which were found to be in abundance. The G.*perpensa* crude extracts showed antibacterial activity against most of the Gram-positive bacteria of which the best activity was found against *Staphylococcus aureus* .The different phytochemicals that have been identified in this study showed anti-bacterial effects as well and great potential for possible medicinal applications of this plant.

Keywords: *Gunnera perpensa*, Medicinal plants, phytochemicals, GCxGC- TOF MS.

SYNERGISTIC COMBINATION OF NISIN AND SALTS OF ORGANIC TO INACTIVATE *LISTERIA MONOCYTOGENES* ATCC 7644 ON FRESH-CUT TOMATO STORED AT DIFFERENT TEMPERATURES

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Abstract

The inhibition of *Listeria monocytogenes* ATCC 7644 on fresh-cut tomato using nisin, and in combination with organic salts was investigated. Nisin at 5000 UI/mL alone and in combination with organic salts (sodium citrate and sodium acetate each at 3 and 5 g/100 mL) were introduced on fresh-cut tomato previously inoculated with 10^8 cfu/mL of *L. monocytogenes* ATCC 7644. Chlorine at 200 ppm was used as control. Inoculated samples were observed at 0, 24, 48 and 72 h at different temperatures (4, 10 and 25 °C). Effect of antimicrobial treatment was observed on quality parameters during the assay (pH, soluble solids, titratable acidity and vitamin C). Colour parameters were also observed at the lowest keeping temperature for 10 days. Both nisin and organic salts inhibited the growth of *L. monocytogenes*, but the combination of the two compounds was more effective. Nisin-sodium citrate combination at 5 % concentration showed significantly ($p \leq 0.05$) the most effective combination, while chlorine control was the least effective on *L. monocytogenes* Quality parameters were substantially retained especially at 4 °C suggesting good shelf stability at low temperature. This result demonstrates cheap and eco-friendly approach of reducing this pathogen of health concern in common fresh produce.

Keywords: Listeria monocytogenes, nisin, fresh produce, sodium citrate, sodium acetate.

ACUTE AND SUB-ACUTE TOXICITY STUDIES OF AQUEOUS AND METHANOL EXTRACTS OF NELSONIA CAMPESTRIS IN RATS

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Abstract

Objective: *Nelsonia campestris* is a plant that grows in semi-arid regions, and is used as early morning drink but also administered to children suffering from measles in order to treat the prevailing bacterial infections that accompany the viral illness. Methods: Acute oral toxicity study of aqueous and methanol extracts was carried out by administration of 10, 100, 1000, 1600, 2900 and 5000 mg/kg bodyweight to rats in their respective groups. Sub-acute toxicity (twenty eight days of extract administration) study was conducted by oral administration of the extracts at daily doses of 100, 300 and 600 mg/kg bodyweight to another group of rats, while rats in the control group received 0.5ml of normal saline. Results: The median lethal dose (LD_{50}) of extracts of *Nelsonia campestris* in rats was determined to be greater than 5000 mg/kg bodyweight. There was no significant ($p>0.05$) difference between the test dose groups for aqueous and methanol extracts in relation to the control group for serum electrolytes (Na^+, K^+, Cl^-, HCO_3^-), serum albumin, total and conjugated bilirubin. Similarly, mean organ/bodyweight ratio and all haematological parameters (white blood cell, red blood cell, mean cell volume, mean corpuscular haemoglobin, mean corpuscular haemoglobin concentration, packed and cell volume) evaluated were not significantly ($p>0.05$) different from the control. There was a significant increase ($p<0.05$) in the activity of serum liver enzymes (Aspartate Aminotransferase, Alkaline Phosphatase), serum urea and creatinine of rats administered 300 and 600 mg/kgbw of the aqueous extract. Methanol and aqueous extracts administered at 600 mg/kgbw resulted in a significant increase ($p<0.05$) in serum urea and total protein, respectively. The activity of serum Alanine Aminotransferase decreased significantly ($p<0.05$) when the rats received 100 and 300 mg/kg bw of both extracts. Histopathological examination revealed mild to moderate hepatic and cortical necrosis of liver and kidney respectively on administration of both extracts at 100 and 600 mg/kg bw. A moderate dose of 300 mg/kg bw of the aqueous and methanol extracts caused lymphocytic infiltration and portal congestion, respectively. Conclusion: Intake of high doses of this plant extracts may exhibit mild organ toxicity.

Keywords: *Nelsonia campestis*, Toxicity, Hepatic Necrosis, Cortical Necrosis.

MOLECULAR COMPARISON OF INTRASPECIFIC VARIATION IN THE BACTERIAL STRAINS RESIDENT IN THE RHIZOPLANE AND RHIZOSPHERE OF BAMBARANUT (*VOANDZEIA SUBTERRANEA L. THOUARS*)

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Abstract

Bambaranut (Vorandzeia subterranean L. thouars) is a seed of African origin used locally as a food source. It is the 3rd most