Pharmacogn. Commn.
A multifaceted peer reviewed journal in the field of Pharmacognosy and Natural Products
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Looking Back  Looking Forward

This occasional section within the journal surveys visions and achievements, often not on the main track of the developing biomedical sciences, but all relating to discoveries and developments of medicinals – both ancient and modern. What they have in common, in one way or another, is providing further background and glances around the edges of the core discipline of pharmacognosy, as it has been and continues to evolve within our times.

Montmorency Tart Cherries Alleviate Gout Associated Pain via A Reduction in Uric Acid Levels

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DOI : 10.5530/pc.2015.4.10

The consumption of Montmorency tart cherries (*Prunus cerasus* L.) reduces blood uric acid levels resulting in a reduction in gout associated pain.[1] A study from Northumbria University, UK recently reported that the consumption of 2 doses of concentrated tart cherry juice daily (30 or 60 mL per doses) resulted in significant decreases in blood uric acid levels. The study also reported markedly increased levels of urine uric acid levels, suggesting that the tart cherry juice promoted uric acid excretion. Interestingly, the reduction in blood uric acid levels was independent of the dose, with the 30 mL doses resulting in similar levels of uric acid reduction as the 60 mL doses. Furthermore, the Northumbria University study also reported that the consumption of Montmorency tart cherries also induced a marked increase in the plasma levels of antioxidant anthocyanins. These findings have also been supported by a further study published in the Journal of Functional Foods, which reported that blood antioxidant contents were elevated for up to 12 h following ingestion of Montmorency tart cherry juice.[2]

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Increasing the Usefulness of Conventional Antibiotics through Synergistic Interactions with Plant Antimicrobials

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With the increasing incidence in multi-antibiotic resistant bacterial strains, many conventional antibiotics have greatly reduced efficacies and there is a very real need to develop new therapies to combat pathogens. Several lines of research have focussed on the development of new drugs, either from synthetic approaches or from discovering as yet undiscovered compounds from nature (particularly from plants). Both methodologies have had some notable successes, yet the number of new antibiotics reaching the market has dramatically decreased from the heydays of the 1980's. Indeed, a recent review cited the number of new antibiotics approved for market between 2008 and 2011 as only 2, which is substantially decreased from the 17 new antibiotics which made it to market between 1980 and 1984.[1] However, a further strategy to combat antibiotic resistance using combinational therapies has proved effective for in combatting antibiotic resistant pathogens. A notable example is the co-administration of clavulanic acid with β-lactam antibiotics (e.g. penicillin) to act as an inhibitor of β-lactamase.[2] The synergistic action of these compounds has enabled an antibiotic which has previously been very useful to be useful again. Several recent studies have re-examined plants, not only to discover compounds with useful antibiotic properties of their own, but also to search for compounds/extracts etc. which have synergistic activities with known antibiotics. With this in mind, a recent publication has reported that several Southern African plant species enhanced the antibiotic efficacy of conventional antibiotics against a panel of bacterial pathogens.[3] Of particular note, the *Escherichia coli* growth inhibitory activity of ciprofloxacin was substantially potentiated by the addition of either *Agathosma betulina* or *Sutherlandia frutescens*, without a co-increase in toxicity. This study highlights the potential of such combinations to increase the efficacy of existing antimicrobial therapies.

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Kakadu Plum Extracts in the Prevention and Treatment of Giardiasis

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Giardiasis, a disease commonly associated with debilitating diarrhoea and childhood morbidity, is a caused by the gastrointestinal protozoal parasite *Giardia duodenalis* (sny. *G. intestinalis*, *G. lamblia*). The current drug of choice for the treatment of giardiasis is metronidazole. However, metronidazole treatment is associated with a number of unpleasant side effects (including nausea, diarrhoea, weight loss, abdominal pain and dizziness) and toxicities. It is best considered as a short term treatment only. A recent National Toxicology Program report by the US Department of Health and Human Services also listed metronidazole as 'reasonably anticipated to be a human carcinogen'.[1] A further worrying trend is the emergence of metronidazole resistant strains of Giardia spp.[2] In a recent review,[3] the authors highlighted the importance of developing new giardiasis treatments: "Therefore, because of the prevalence of giardiasis and limited treatment options, the development of new agents is a high priority."

Recent studies have examined the anti-Giardial activity of conventional antimicrobials such as benzimidazoles[4] and novel synthetic compounds such as azaindoles.[5] Unfortunately, whilst targeting giardiasis with purified antibiotics may initially appear a viable method of treatment, it may also be problematic as prolonged antibiotic treatment/exposure may result in the production of antibiotic resistant bacterial strains. Some studies have also begun to re-examine the use of complementary and alternative therapies and functional foods to treat giardiasis. A recent publication in Parasitology Research[6] has reported that *Terminalia ferdinandiana* (Kakadu plum) fruit extracts were potent inhibitors of *G.duodenalis* proliferation with IC_{50} values as low as 140 µg/mL. Kakadu plum extracts therefore have potential in the treatment and prevention of giardiasis.

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