Cytoxicity assay of Combretum farinosum extracts

ABSTRACT

Background:
The use of plants from the Combretaceae family in medicine has been of much interest to scientists. However, Combretum farinosum has little published research on its pharmacological properties, unlike many of its extensively studied congeners.

Materials and Methods:
Combretum farinosum roots, fruits, leaves, and stems were sequentially extracted via Soxhlet extraction using petroleum ether, acetone, and ethanol solvents. A three day Wallert and Provost Lab™ 96-well plate MTT cell proliferation assay was performed on LL47 lung fibroblasts, H69 small lung cell carcinoma, and BJ fetal foreskin cell lines.

Results:
Combretum farinosum roots petroleum ether extract showed the strongest anti-proliferation activity of all the extracts against the normal cell lines (IC50 of 0.504 mg/mL for the BJ cells and 0.608 mg/mL for the LL47 cells). Combretum farinosum roots petroleum ether extract also showed the strongest anti-proliferation activity of all the extracts against the only cancer cell line tested (IC50 0.642 mg/mL).
Conclusions:

Both the roots petroleum ether and roots acetone extracts may have potential use in targeting diseased non-cancerous tissue (e.g. benign tumors) due to their cytotoxicity to normal cell lines. Finally, the roots petroleum ether extract may be the most promising extract for potential use as an anticancer drug if active compounds can be more thoroughly isolated.

Future Scope: (statement of significance)

Results from this study show that extract prepared by extracting the roots of C. farinosum with petroleum ether particularly was more cytotoxic than Doxorubicin™ (a known anticancer agent) when tested against BJ and LL47 cell lines. This result will serve as basis for isolation, characterization and further cytotoxic assay of the pure isolates from the roots petroleum ether extract of C. farinosum. The potential synergistic or antagonistic effects of various isolates on each other will be studied in the quest to discover novel compound(s) in the treatment of various cancers.

My Experience:

My trip to the 252nd American Chemical Society national meeting in Philadelphia, Pennsylvania was an academically enlightening experience and I wanted to extend my gratitude to the college of arts and sciences and Texas A&M International University for sponsoring this trip. At this conference I presented a poster entitled Combretum farinosum extract toxicity to skin and lung cell lines as measured by the MTT assay at the medicinal chemistry session. The benefits of participating were several fold. This was my first academic conference outside of TAMIU and the first time I presented research at a national level. The timing of this conference motivated me to finish my research before the summer so I would be presenting a complete picture of the data I
collected. My presentation at Philadelphia was a continuation and expansion of the award winning research I presented at the 2016 LBV conference at TAMIU. At the conference I conversed with several researchers from all over the U.S. and even some individuals from other countries. Most notably, I talked with presenters from Pennsylvania, Illinois, Mexico, and South Africa. I spoke with one individual who presented groundbreaking research on activating pathways which could prevent bacterial cells from effluxing antibiotics. Another researcher examined therapeutic benefits of drugs based upon where certain function groups were selectively placed. One presenter shared a similar motivation for her research as I did mine. Both of us were focused on how to use traditional medicine more effectively with one of the goals of the research being to help some of the same indigenous people groups who discovered the medicine. This researcher was looking at cheap plant based cures for Leishmaniasis by testing compounds against parasite infected reptilian cells. Several other researcher used MTT assays like me but studied cytotoxicity of either isolated or semi-synthetic compounds. Once again this conference could not have been attended if not for the generous support of the college of arts and sciences. Thank you!