

ABSTRACT

This study is a two-phased investigation. The first phase was confined on the isolation and identification of the bioactive metabolites of *Eupatorium toppingianum* and *Mimosa invisa*. The second phase was the development of investigatory activities for chemistry teachers in the regions of Visayas. These proposed investigatory activities were based on the results obtained in the phase one of this study. Along the course of isolation of the metabolites from the chloroform leaf extract of *E. toppingianum* and *M. invisa*, the former afforded 3 isolates (A, B and C) while the latter yielded 4 isolates (D, E, F and G). Of the 3 isolates of *E. toppingianum*, only isolate B (R_f 0.62, in EtOAc) showed bioactivity with Brine Shrimp Bioassay (LC_{50} 7.7 $\mu\text{g/mL}$). Likewise, of *M. invisa*, only isolate F (R_f 0.62, in 80% EtOAc) showed significant bioactivity potential (LC_{50} 24.2 $\mu\text{g/mL}$) among the 4 isolates. Isolate B showed antimicrobial potential against the common pathogens: *S. typhi*, *B. subtilis*, *S. aureus*, *E. coli*, *V. cholera*, *S. dysenteriae* and *A. niger*. Similarly, isolate F showed also a complete inhibition against *B. subtilis*, *S. aureus*, *E. coli*, *S. aeruginosa* and *C. albicans* at a concentration of 2.0 $\mu\text{g/mL}$. When these 2 bioactive isolates were subjected to micronucleus test, isolate B (LD_{50} 31 mg/kg mouse) showed 93% reduction of Micronucleated Polychromatic Erythrocytes (MPCE), induced by Mitomycin C, while isolate F showed only 81% reduction at 200 $\mu\text{g/kg}$ mouse. Of these 2 antimutagens, only isolate B was fully



elucidated using chemical spectroscopic methods: ^1H NMR, ^{13}C COSY, ^1H - ^1H COSY. Long-range ^1H - ^{13}C NMR COSY, DEPT, MS, UV and IR. Based on the extensive computer search of the proposed structure of isolate B, it was confirmed as a novel chromene. However, isolate F was not elucidated due to time constraint and scarcity of sample, but it was inferred as carotenoid based on its physical properties, chromatogram, $[\alpha]_D$, melting point, IR and UV spectra.

Enrichment program in Natural Products Research was proposed. From the self-survey questionnaires, 10 stress factors experienced by the teacher-participants had surfaced. Along the course of the enrichment program, 13 plant species in the campus of the University of San Carlos were screened for alkaloids and terpenes; antimicrobial and cytotoxic plant extracts. Eight plant species were found to contain anticancer metabolites. After the 18-hour lecture in Chemical Spectroscopy, the teacher-participants showed significant improvement on their interpretative skills of spectral data at 0.01 level of significance. It was further recommended that a continued enrichment program in natural products be provided to improve and upgrade the Natural Products Research in the Visayas regions.

