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# CHEMISTRY OF SOME ANNONACEAE PLANTS

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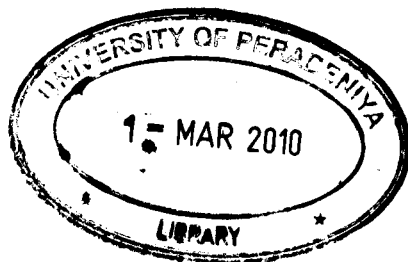
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## ABSTRACT

## CHEMISTRY OF SOME ANNONACEAE PLANTS

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This thesis describes the chemistry and biological activities of *Xylopia championii* Hook. f. & Thoms and *X. parvifolia* (Wight) Hook. f. & Thoms, antioxidant and mosquito larvicidal activities of some endemic Annonaceae plants, and antifeedant activity of *Goniothalamus gardneri* Hook. f. & Thoms.

The first section deals with the antioxidant and antifungal activities of alkaloids and terpenoid isolated from *X. championii*. Seven alkaloids, *O*-methylmoschatoline (9), (-)-discretine (97), (+)-laudanidine (100), oxopurpureine (160), demethyl-10 xylopinine (161), nordicentrine (162), dehydrocorytenchine (163) were isolated. The alkaloids (+)-laudanidine (100) and (-)-discretine (97) showed potent antioxidant activity in the DPPH assay. (-)-Discretine (97) and nordicentrine (162) showed potent antifungal activity against the fungus *Cladosporium cladosporioides*. In addition, a terpenoid, *ent*-kaur-16-en-19-oic acid (23) isolated from *X. championii* showed moderate antifungal activity and weak antioxidant activity. However, it showed a good activity against the second instar larvae of *Aedes aegypti* (L.). None of the isolated pure alkaloids showed a positive response in the mosquito larvicidal assay against the second instar larvae of *A. aegypti*. Interestingly these alkaloids seem to be stimulating the growth of the larvae when compared to the control. Another terpenoid, 15 $\beta$ -hydroxy-(-)-kaur-16-en-19-oic acid (77) along with *ent*-kaur-16-en-19-oic acid (23), *O*-methylmoschatoline (9), (-)-discretine (97), (+)-laudanidine (100), oxopurpureine (160), nordicentrine (162), dehydrocorytenchine (163) was isolated from the stem bark of *X. parvifolia*.

The next section deals with the antioxidant and mosquito larvicidal activities of some endemic Annonaceae plants namely, *Alphonsea hortensis* H. Huber, *Desmos*

*zeylanica* Hook. f. & Thoms., *Enicosanthum acuminata* (Thw.) Airy-Shaw, *Goniothalamus hookeri* Thw., *G. salicina* Hook. f. & Thoms., *Phoenicanthus coriacea* (Thw.) H. Huber, *Uvaria semecarpifolia* Hook. f. & Thoms., *U. sphenocarpa* Hook. f. & Thoms., *Xylopia championii* Hook. f. & Thoms. and *X. nigricans* Hook. f. & Thoms. The results obtained from the DPPH assay revealed that some of the extracts had superior ability to neutralize free radicals. For example, the MeOH extract of stem of *A. hortensis* (56.30 %), MeOH extract of leaves of *U. semecarpefolia* (57.33 %), CH<sub>2</sub>Cl<sub>2</sub> and MeOH extracts of stem bark of *X. championii* (67.05 % and 79.03 %, respectively), MeOH extracts of leaves of *G. salicina* (59.98 %), and MeOH extract of seeds of *X. nigricans* (62.06 %) showed high radical scavenging activity compared to the standard DL- $\alpha$  tocopherol (55.84 %). In the mosquito larvicidal assay, the CH<sub>2</sub>Cl<sub>2</sub> and MeOH extracts of *G. hookeri* demonstrated high larvicidal activity (LC<sub>50</sub> = 1.9 and 2.1 ppm, respectively) while its leaves exhibited even higher activity (LC<sub>50</sub> = 0.4 ppm). The CH<sub>2</sub>Cl<sub>2</sub> extracts of stem of *A. hortensis* and leaves of *E. acuminata* (LC<sub>50</sub> = 46.9 and 41.5 ppm, respectively) and the MeOH extracts of seeds of *D. zeylanica* and bark of *A. hortensis* (LC<sub>50</sub> = 44.6 ppm and 46.9 ppm, respectively) showed significant activity. The most active was the CH<sub>2</sub>Cl<sub>2</sub> extract of leaves of *G. hookeri* with an LC<sub>50</sub> value of 0.4 ppm.

The latter part of the study describes the antifeedant activity of two acetogenins **164** and **165** isolated from *G. gardneri* Hook. f. & Thoms. Both **164** and **165** showed potent antifeedant activity against the second instar larvae of *Plutella xylostella* (L.).

The results obtained from this study revealed that the family Annonaceae is a good source of antioxidants and larvicides.