

EXTRACTION, ISOLATION AND PURIFICATION OF BETULINIC ACID FROM *MELALEUCA SP.*

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Introduction

Betulinic acid, $C_{30}H_{48}O_3$, is an unsaturated monobasic triterpene hydroxy-acid. It could be derived from betulin or betulinaldehyde via oxidation reaction, probably by air oxidation in nature. Betulinic acid is found throughout the plant kingdom in traces and is soluble in many organic solvents such as pyridine, ethanol, acetone, methanol and ethyl acetate. Betulinic acid was reported to selectively kill human melanoma cell while leaving healthy cells alive and retard the progression of HIV-1 infection. *Melaleuca sp* belongs to the myrtaceae family, and commonly called Gelam (local name). The tree appears to prefer low lying swampy areas. The leaves of *melaleuca sp* may be subjected to steam distillation to extract the *cajiputi oil* which has germicidal and other medicinal properties. The objective of the study was the extraction, isolation and purification of betulinic acid from *Melaleuca sp*

Materials and Methods

Samples were collected from various places in Malaysia: Johor and Selangor. The plant material (i.e. leaves, seed, branches, bark, and flowers) was air dried at room temperature. The plant materials were soaked in methanol, chloro-

form and hexane; then the solvent was removed by rotary evaporator. After TLC analysis using various solvents combination; the crude extract was subjected to column chromatography and crystallisation for purification. The pure product was tested for antibacterial properties using the inhibition of the growth of both *staphylococcus aureus* and *Escherichia coli sp.*. The structure of the isolated material was studied using H- and ^{13}C -NMR collaboration with other institutions, (FRIM, University of Manchester, UK, and University of Chiba, Japan).

Results and Discussion

Betulinic acid and *ursolic acid* were isolated from the seed of *melaleuca cajiputi*. These two triterpenes were confirmed by spectroscopic method (i.e IR, NMR and MS) analyses and by direct comparison (m.p and mix. mp) with authentic samples (Ahmad et al. 1997). In contrast the chemical investigation from the flowers of *M. cajiputi* yielded only betulinic acid (Ahmad et al. 1999). Chemical examination of other parts of the plant is in progress.

Conclusions

Chemical investigation of seed and flowers of *M. cajiputi* resulted in the isolation of two triterpene compounds (*betulinic acid* and *ursolic acid*).

References

- Ahmad, F.B.H, Hassan, V.U.L, Zakaria, R., and Ali, J.H. 1997. Betulinic Acid and Ursolic Acid from Seed of *M. cajiputi*, *Oriental J. of Chemistry*. 13(3): 231-232.
- Ahmad F.B.H, Hassan, V.U.L., Sukari, M.A., Ali, J.M., and Ali, A.M. (1999). Betulinic Acid from The Flower of *M. cajiputi*. *Oriental J. of Chemistry*. (submitted).