A PHARMACOLOGICAL AND TOXICOLOGICAL EVALUATION OF A DECOCTION OF LEAVES AND STEMS OF THE MEDICINAL PLANT, *Anisomeles indica*

BY

MAJUWANA GAMAGE DHARMASIRI

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ABSTRACT

A decoction of leaves and stems of *Anisomeles indica* (Family: Lamiaceae) is claimed to be used in the traditional medicine of Sri Lanka to treat pains, rheumatic joints and to reduce fever and in Dutch East Indies to treat kidney stones. However, validity of these claims have not been scientifically tested (except for antipyretic activity). Further, the toxic effects of the decoction is not known and it may possess new pharmacological activities. These activities may vary with flowering of the plant. The aims of this study were to scientifically investigate the validity of these claims (anti-inflammatory, analgesic and diuretic activities) using rats toxic effects, hither to unreported pharmacological activities (hepatoprotective, gastroprotective and hypoglycaemic activities) the difference in the pharmacological activities before and after flowering of the plant, the basic chemical profile of the decoction. The doses tested were 125, 250 and 500 mg/kg of freeze-dried decoction. The results revealed that anti-inflammatory, analgesic, antihyperalgesic, diuretic and gastroprotective effects were confined to the pre-flowering plant while hepatoprotective activity was observed only in the flowering plant. Hypoglycaemic effect was common to both stages of the plant but was more potent after flowering. Anti-inflammatory effect was dose-dependent for both acute and chronic inflammations. The anti-inflammatory potency was higher than that of indomethacin in acute inflammation (by 32%) and chronic inflammations (by 7.5%). Continuous treatment of the extracts did not induce tolerance in the chronic inflammatory models. Several mechanisms can account for the anti-inflammatory effect: prostaglandins synthesis inhibition, antihistamine, free radical scavenging, and membrane stabilising activities. The analgesic activity of the plant was dose-dependent and the effect did not decrease with continuous use. The analgesic effect was more potent than aspirin (by 45%). The analgesic effect was supraspinally mediated but not through opioid receptors. The

analgesic effect was due to the inhibition of prostaglandins synthesis. The anti-hyperalgesic effect was also dose-dependent and mediated through inhibition of prostaglandin synthesis. The diuretic action was seen only with the highest dose of the extract and it was more powerful than frusemide (by 104%). The mechanism of diuretic action is likely to be an impairment of aldosterone activity. The gastroprotective activity was dose-dependent. This was due to antihistamine and mucus content enhancement activities. The hepatoprotective activity was mild and was possibly mediated by its antiradical activity. The hypoglycaemic action was more pronounced in the flowering plant and was dose-dependent. However, it was less potent than tolbutamide. The hypoglycaemic action is likely to be due to an enhancement of insulin secretion. None of the treatments produced acute or chronic toxic effects. Phytochemicals were common in the plant at both stages in terms of alkaloids, phenols, coumarins, triterpenoids and saponins. However, chromatographic profiles for alkaloids and triterpenoids, and UV absorption profiles were different from each other indicating a some form of chemical difference between the two decoctions obtained from growth stages of *A. indica*. In conclusion, the results of this study scientifically justify the claims made in the traditional medicine about the therapeutic uses of the decoction of *A. indica* while exposing the loss of it after flowering of the plant. In addition, the hitherto unreported pharmacological activities of the plant has been identified. After all, this study discovers for the first time, an alteration of pharmacological activities of a plant after flowering and therefore it opened door for a new area of research into bioactivities of plants for the new millennium.