Evaluation of Anti-inflammatory Activity of the Essential Oil of *Alpinia Calcarata Rosc*. Rhizome and Formulation of Topical Dosage Form

NMM Fazlan[1], P Karthikeyan[2], WJABN Jayasuriya[3#], LDAM Arawwawala[4] and TS Suresh[5]

[1,2,3]Department of Pharmacy and Pharmaceutical Sciences, Faculty of Allied Health Sciences, University of Sri Jayewardenepura, Sri Lanka
[4]Industrial Technology Institute, Colombo 07, Sri Lanka
[5]Department of Biochemistry, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka
[#]banukie@sjp.ac.lk

Alpinia calcarata, commonly known as Heen Araththa belongs to the family of Zingiberaceae. This plant has demonstrated anti-bacterial, anti-diabetic, anti-helminthic, antifungal and anti-inflammatory activities. The aim of this study was to develop an emulgel using the essential oil of the rhizome against inflammation. Preliminary phytochemical screening was performed for the hot water extract of the rhizome as per WHO guidelines of quality control methods of medicinal plant materials. A preliminary ethno-pharmacognostical study was carried out among 20 Ayurvedic, Siddha and Unani practitioners using an interviewer administered questionnaire. Anti-inflammatory activity of the essential oil was evaluated through in vitro methods using membrane stabilization and thrombolytic tests. A topical dosage form in the form of an emulgel was developed, using the essential oil of rhizome of *A. calcarata*. Different formulations were prepared using varying amounts of the gelling agent. Carbapol 940 in purified water was used as the gel phase. Phytochemical screening revealed the presence of alkaloids, flavonoids, phenolics, sesquiterpenes and monoterpenes. Ethnopharmacognostical study revealed that most physicians used the whole plant of *A. calcarata* in different formulations for different illnesses. Membrane stabilization and the thrombolytic activities were not statistically significant in tested concentrations (100- 400 μg/mL). However, by increasing the concentration of the oil, an increase in the percentage inhibition of haemolysis was observed. A maximum of 7.2 % inhibition of heamolysis was observed at 400 μg/mL of essential oil. A spreadability test was performed on the emulgel and the value of spreadability was 0.12 minutes. Further studies are warranted to evaluate the safety and efficacy of the said dosage form.

Keywords: *Alpinia calcarata*, Anti-inflammation, Membrane stabilization