ANTIMALARIAL ACTIVITY, ACUTE TOXICITY AND PHYTOCHEMICAL SCREENING OF SELECTED ANTIMALARIAL PLANTS

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Abstract

Malaria is a major cause of deaths in the world. It is a vector-borne disease caused by protozoan plasmodia parasites. The parasites are currently becoming resistant to current antimalarial drugs thus there is need to find alternative drugs. Plants have been used traditionally to treat malaria and they could be a source of alternative antimalarial drugs.

This study was conducted to investigate antimalarial activity, acute toxicity and phytochemical composition of selected antimalarial plants. The plants studied were *Flacourtia indica* (Burm.f.) Merr. (Flacourtiaceae), *Hoslundia opposita* Vahl. (Lamiaceae), *Ocimum gratissimum* L. (Lamiaceae) and *Solanum incanum* L. (Solanaceae). Either whole or parts of the plant depending on the part traditionally used to treat malaria were collected from Msambweni district, Kenya. Aqueous and organic extracts from each plant part were evaluated for their *in vivo* antimalarial activity and acute toxicity using mice model. Antimalarial activity was evaluated using Swiss albino mice infected with *Plasmodium berghei* (ANKA). Thin Layer Chromatography (TLC) was used to screen the extracts for possible active compounds.

The aqueous and organic extracts of the plants under study exhibited a range of chemosuppression. Aqueous extracts of *S. incanum*, *F. indica*, *O. gratissimum* and *H. opposita* had percentage chemosuppression of 14.77, 0.21, 17.95 and 90.62% respectively. The organic extracts on the other hand exhibited percentage chemosuppression of 31.22, 87.84, 88.07 and 41.97% respectively. Chloroquine, which was the positive control, had a chemosuppression of 95.97%. There was no significant difference between the chemosuppression of the aqueous extracts of *H. opposita* and the organic extracts of *F. indica* and *O. gratissimum* and that of Chloroquine ($p < 0.05$).

Aqueous extracts of *O. gratissimum* and organic extracts of *S. incanum* had LD_{50} above 1000ug/ml and were hence considered to be non-toxic to brine shrimp. On the other hand, aqueous extracts of *S. incanum*, *F. indica* and *H. opposita* and organic extracts of *F. indica*, *O. gratissimum* and *H. opposita* with $LD_{50} < 500\mu g/ml$ were found to be toxic. Acute toxicity studies showed that the aqueous and organic extracts of the four plants under study were not toxic to mice at a concentration of 2000 mg/kg body weight.

The current project was carried out to validate the medicinal use of the plants in traditional healthcare and allow for the sustainable use and commercialization of these plants. The findings indicate good antimalarial activity of the aqueous extract of *H. opposita* roots, and organic extracts of the leaves of *F. indica* and *O. gratissimum*. This suggests these plants may have active principles against *P. falciparum* parasites and are thus a potential source of antimalarial drugs.

Key words: Antimalarial; acute toxicity; phytochemical analysis; medicinal plants, aqueous, organic, *Flacourtia indica, Hoslundia opposita, Ocimum gratissimum, Solanum incanum*