

Abstract

Title: Antiplasmodial and Phytochemical Investigation of *Monanthes parvifolia* (Oliv.) Verdc ssp. *kenyensis* Verdc (Annonaceae).

Introduction

Attention has recently shifted to ethnopharmacological study of plants as sources of alternative medicines. This approach has yielded clinically useful medicines particularly for the treatment of malaria. Upon literature survey, plants belonging to the Annonaceae family have been found to be widely used in traditional medicine for the treatment of malaria. In Kenya, particularly in the coastal region, *Monanthes parvifolia* (Oliv.) ssp. *kenyensis* Verdc (Annonaceae) is used for the treatment of malaria. The aim of the present study was to investigate the antiplasmodial and phytochemical properties of this plant. This was in order to establish its ethnopharmacological basis of its use in the treatment of malaria.

Materials and Methods

The authenticated plant material consisting of the twigs and leaves was collected from Thika, Kenya. Preparation of the reagents and plant specimens for macroscopic and microscopic study was carried out as per published protocols or validated methods. Soxhlet extraction and bioassay-guided fractionation in combination with chromatographic techniques were used for the extraction, isolation and purification of the isolated compounds. Spectroscopic methods were used to carry out structure elucidation of the isolated compounds. *In vitro* antiplasmodial tests for both the crude extracts and phytochemical isolates were carried out using the chloroquine-sensitive (D10) and chloroquine-resistant (Dd2) *Plasmodium falciparum* strains. Cytotoxicity testing was done using Chinese Hamster Ovarian (CHO) cells on active crude extracts and the phytochemical isolates. Crude extract of *Monanthes parvifolia* were also tested for glycaemic, analgesic and antipyretic activities.

Results and Discussion

The antiplasmodial activity against the chloroquine-sensitive and chloroquine-resistant *Plasmodium falciparum* strain ranged from 5.58 to 38.07 µg/ml for the crude water and methanol extracts from the leaves and twigs. The isolated compounds (Quercetin-3-*O*- α -rutinoside, Quercetin-3-*O*-rhamnoside) exhibited antiplasmodial activity ranging from 10.85 to 24.93 µg/ml. All tested extracts and the isolated compounds showed little or no toxicity to the Chinese

Hamster Ovarian (CHO) cells. The crude extracts also exhibited antipyretic and analgesic activity.

Conclusion and Recommendation

The reported microscopic features showing the presence of paracytic stomata, oil glands and covering trichomes will be found to be useful in the authentication of this plant in future. The study has further provided information on antiplasmodial, toxicity, antipyretic, analgesic and glycaemic activities of *Monanthes parvifolia*. In view of the finding of higher antiplasmodial activity in the polar crude extracts, it is recommended that further work including *in vivo* studies be carried out.