Antiplasmodial potential of traditional phytotherapy of some remedies used in treatment of malaria in Meru–Tharaka Nithi County of Kenya

Abstract

Ethnopharmacological relevance

Medicinal plants play a major role in many communities across the world, in the treatment and prevention of disease and the promotion of general health. The aim of the study was to escalate documentation from an earlier study of medicinal plants, traditionally used to combat malaria by the Ameru community of Imenti Forest area and Gatunga in Eastern Region of Kenya, and validate their ethnopharmacological claims by evaluating their antiplasmodial efficacies.

Materials and methods

The study was carried out in Meru County at Imenti Forest Game Reserve and in Tharaka Nithi County at Gatunga. Traditional health practitioners (THP) were interviewed with a standard questionnaire to obtain information on medicinal plants traditionally used for management of malaria. Group interviews were also held among THPs and members of the community. The antiplasmodial activities of the crude extracts against chloroquine sensitive (D6) and resistant (W2) Plasmodium falciparum were determined using the semi-automated micro-dilution technique that measures the ability of the extracts to inhibit the incorporation of (G-3H) hypoxanthine into the malaria parasite.

Results

Ninety nine (99) species in eighty one (81) genera and forty five (45) families were documented and evaluated for in vitro antiplasmodial activity. Compositae, Fabaceae, Meliceae, Rubiaceae, Rutaceae and Verbenaceae had the highest number of species mentioned in treatment of malaria in Meru/Tharaka Nithi study area. Twenty four (24.2%) species showed antiplasmodial efficacy of $IC_{50} \leq 5$ μg/ml and were considered to have potential for isolation of antimalarial compounds. Eight plant (8) species with moderate antiplasmodial activity namely; Cordia *africana*, Commiphora *africana*, *Elaeodendron buchananii*, *Gomphocarpus semilunatus, Tarena graveolens*, Plectranthus *igniarius*, Acacia senegal *and* Ziziphus *abyssinica* were documented from this region for the first time for the treatment of malaria. The antiplasmodial activity of MeOH root bark extract of Maytenus *obtusifolia* was very promising ($IC_{50} < 1.9$ μg/ml) and this is the first report on traditional use of *M. obtusifolia* for treatment of malaria and antimalarial activity.

Conclusions

The results seem to indicate that ethnopharmacological inquiry used in search for new herbal remedies as predictive and could be used as the basis for search of new active principles. Eight plant (8) species are documented from this region for the first

time for the treatment of malaria. This is the first report on traditional use of *M. obtusifolia* for treatment of malaria and evaluation of its antiplasmodial activity.

Graphical abstract

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