In vitro antiplasmodial activity and toxicity assessment of some plants from Nigerian ethnomedicine.


Oyindamola Abiodun1,2, Grace Gbotosho2, Edith Ajaiyeoba2, Tientcha Happi2, Mofolusho Falade2,3, Sergio Wittlin4, Akintunde Sowunmi2, Reto Brun4, Ayoade Oduola5

1Department of Pharmacology and Therapeutics, College of Health Sciences, Ladoke Akintola University of Technology, Oshogbo, Nigeria
2Malaria Research Laboratories, Institute of Advanced Medical Research and Training, College of Medicine, University of Ibadan, Ibadan, Nigeria
3Department of Biological Sciences, Redeemers University, Mowe, Ogun State
4Parasite Chemotherapy Unit, Swiss Tropical Institute, Basel, Switzerland
5Strategic and Discovery Research, Special Program for Research and Training in Tropical Diseases, World Health Organization, Geneva, Switzerland

Address for Correspondence: Oyindamola Abiodun, Department of Pharmacology and Therapeutics, College of Health Sciences, Ladoke Akintola University of Technology, P.M.B. 4400, Oshogbo, Nigeria. Tel: +234 7030964774. E-mail: oyinoduola@yahoo.co.uk

Context: The emergence and spread of Plasmodium falciparum-resistant parasites to nearly all available antimalarial drugs pose a threat to malaria control and necessitates the need to continue the search for new effective and affordable drugs. Ethnomedicine has been shown to be a potential source of antimalarial compounds or source of template for the synthesis of novel antimalarial molecules.

Objective: The antiplasmodial activity and toxicity assessment of 30 plant extracts from eight medicinal plants identified in Nigerian ethnomedicine for the treatment of febrile illnesses were evaluated.

Materials and methods: In vitro antimalarial activity was evaluated using Plasmodium falciparum NF54 (sensitive to all antimalarial drugs) and K1 (chloroquine/pyrimethamine resistant) strains in the [3H]-hypoxanthine incorporation assay. Toxicity was determined against mammalian L6 cells using Alamar blue assay.

Results: The ethyl acetate extract of leaves of Ocimum gratissimum Linn. (Labiatae) and hexane extract of stem bark of Trema orientalis (L.) Blume (Ulmaceae) showed the highest antiplasmodial activity (IC50 1.8-1.93 µg/mL) against P. falciparum K1 strain but elicited low cytotoxicity (selective index >10). However, hexane, ethyl acetate or methanol extracts of leaves of Terminalia catappa Linn. (Combretaceae), Jatropha curcas Linn. (Euphorbiaceae), Vitex doniana Sweet. (Verbenaceae) and stem bark of Vitex doniana displayed antiplasmodial activity (IC50 2.3-16.9 µg/mL) with good selectivity (21–120) for malaria parasites.
Discussion and conclusion: The antiplasmodial activity of *Terminalia catappa* and *Vitex doniana* against *P. falciparum* K1 is being reported for the first time in Nigerian ethnomedicine and these plants could be potential source of antimalarial agents.

**Keywords**

*Plasmodium falciparum*, L6 cell, cytotoxicity, *Terminalia catappa*, *Vitex doniana*