J Vector Borne Dis 47, September 2010, pp. 168–174

The potential of the extracts of *Tagetes minuta* Linnaeus (Asteraceae), *Acalypha fruticosa* Forssk (Euphorbiaceae) and *Tarchonanthus camphoratus* L. (Compositae) against *Phlebotomus duboscqi* Neveu Lemaire (Diptera: Psychodidae), the vector for *Leishmania major* Yakimoff and Schokhor

Laban N. Ireri[a,b,e], Jedida Kongoro[b], Peter Ngure[c], Charles Mutai[d], Bernard Langat[e], Willy Tonui[e], Albert Kimutai[b, e] & Obadiah Mucheru[f]

[a]*Division of Vector Borne and Neglected Tropical Diseases, Embu;* [b]*Department of Zoological Sciences, Kenyatta University, Nairobi;* [c]*Daystar University, Nairobi;* [d]*Centre for Traditional Medicine and Drug Research, Kenya Medical Research Institute, Nairobi;* [e]*Centre for Biotechnology Research and Development, Kenya Medical Research Institute, Nairobi;* [f]*International Centre of Insect Physiology and Ecology, Nairobi, Kenya*

Abstract

Background & objectives: Harmful effects of synthetic chemical insecticides including vector resistance, environmental pollution and health hazards have necessitated the current significance in the search for plant-based insecticide products that are environmentally safe and effective to leishmaniases control. The insecticidal activity of *Tagetes minuta* Linnaeus (Asteraceae), *Acalypha fruticosa* Forssk (Euphorbiaceae) and *Tarchonanthus camphoratus* L. (Compositae) extracts were investigated against *Phlebotomus duboscqi* Neveu Lemaire (Diptera: Psychodidae).

Methods: The extracts were prepared from dried aerial parts soaked in methanol and ethyl acetate twice until the filtrates became clear, filtered and dried out by rotary evaporation at 30–35°C. The solid extracts obtained were later prepared into 2.5, 5 and 10 mg/ml. Two millilitres of the solutions were blotted on filter papers, which were dried overnight and placed into jars where adult sandflies were aspirated. Males and females were assayed separately.

Results & conclusion: The extracts had significant mortality ($p<0.05$) in both males and females bioassays but were not significantly different between sexes. The extracts of *Acalypha fruticosa* and *Tagetes minuta* had significantly higher mortality rates than those of *Tarchonanthus camphoratus* and the different concentrations used showed significantly different mortality rates and 10 mg/ml was the most effective concentration. Cent percent mortality was obtained at 96 h of exposure to 5 and 10 mg/ml concentrations except for *Tarchonanthus camphoratus* which had a mortality of only 46.7% in 10 mg/ml bioassay. These extracts were found to be insecticidal to adult sandflies.

Key words *Acalypha fruticosa*; leishmaniases control; *Phlebotomus duboscqi;* plant extracts; *Tagetes minuta; Tarchonanthus camphoratus*

Introduction

Leishmaniases group of parasitic diseases are globally distributed, caused by more than 30 species of protozoans in the genus *Leishmania* Ross and actual transmission to humans is through the bite of approximately 30 species of phlebotomine sandflies[1,2]. They are endemic in more than 60 countries worldwide. At present successful measures to decrease the incidence of leishmaniases is by per-