

## Abstract

### Introduction

To determine the immunostimulatory potential of crude extracts of *Warburgia ugandensis* subsp. *ugandensis* with a soluble leishmanial antigen in vaccinating BALB/c mice.

### Methods

Seventy two female BALB/c mice were randomly assigned into six groups. The mice were vaccinated with soluble *leishmania* antigens (SLA) alone, hexane, ethyl acetate, and dichloromethane extract co-administered with SLA. Unvaccinated mice formed the control group. The induction of cell-mediated immunity following vaccination was determined by measuring in vitro lymphocyte proliferation and the production of interleukin (IL)-4 and gamma interferon (IFN- $\gamma$ ) determined by flow cytometry. Protection against *L. major* was determined by quantifying parasite burdens in *L. major* infected footpads using a limiting dilution assay and by measuring lesion sizes of the infected footpad compared to the contralateral uninfected footpad.

### Results

On vaccination with extracts of *W. ugandensis* subsp. *ugandensis* alone or as adjuvants when used in combination with *Leishmania* antigens, the hexane extract and the dichloromethane extract plus SLA stimulated moderate production of IFN- $\gamma$  and low levels of IL-4. These mice were partially protected from cutaneous leishmaniasis as shown by the slow development of lesions and comparatively less parasite burdens.

### Conclusion

These data suggest that extracts of *W. ugandensis* subsp. *ugandensis* are suitable adjuvants for *Leishmania* vaccines. However, since *W. ugandensis* subsp. *ugandensis* has been shown to be effective against *Leishmania* parasites in vitro and in vivo, further studies ought to be conducted to determine its immunochemotherapeutic potential when co-administered with a soluble leishmanial antigen in vaccinating BALB/c mice.