Investigations of *Artemisia Annua* and *Artemisia Sieberi* Water Extracts Inhibitory Effects on β-Hematin Formation

Mutaz Akkawi1, Suhair Jaberi1, Qassem Abu-Remeleh and Pierre Lutgen2

1Life Sciences Department, College of Science and Technology, Al-Quds University, West Bank, Palestine 2IFBV-BELHERB, Luxembourg

Introduction

Malaria is the most prevalent infectious disease in the world, killing 1-2 million people each year. New drugs are urgently needed to treat drug-resistant strains of malaria. In a previous study we found that extracts from *Salvia palestina* leaves inhibited the formation of β-hematin with efficiency similar to that of chloroquine.

Aim

The objective of this study was to investigate the effect of two plant extracts on hemozoin formation. A comparison between the efficiency of aqueous extracts or infusions of *Artemisia annua* from Luxembourg and *Artemisia sieberi* from Palestine in inhibiting β-hematin formation was done.

Materials and Methods

Water infusions of *Artemisia annua* and *Artemisia sieberi* from Luxembourg and Palestine were used in this study. A semi-quantitative *in vitro* method, based on the inhibition of ferriprotoporphyrin IX (FP) bio-mineralisation developed by Deharo et al. [Deharo E et al. Exper. Parasitol. 2002, 100:252-256.], was used to reveal the differences in amantinal activity of both plants.

Extraction of plant components

A. Preparation of *Artemisia annua* extract (Method A)

Dried leaves and stems were separately ground into coarse powder. Extraction was performed by soaking (1:10) wt./vol. of dried plant part in distilled hot water at 90°C, left for 20 minutes at room temperature, then filtered using MN 615.O110 mm filter paper. All other figures correspond to this extraction method.

B. Infusion of *Artemisia annua* (Method B)

2 g of the plant material were soaked in 150 ml of distilled hot water at 90°C, left for 20 minutes at room temperature, then filtered using MN 615.O110 mm filter paper. All other figures correspond to this extraction method.

Results:

Although it was found that the *Artemisia sieberi* leaf tea infusion was less effective than that of the *Artemisia annua*, the stem infusion of *Artemisia sieberi* was found to be better than that of *Artemisia annua* stems. Results obtained with infusions prepared with tap or well water may be different from results obtained in the laboratory with distilled water. Mixing equal amounts of prepared with tap or well water may be different from results obtained in the laboratory with distilled water.

We are grateful to Prof. Pamela Weathers for her helpful discussions and insightful comments.

Conclusion:

In light of this finding it might be advisable to use *Artemisia annua* in the form of dried leaf powder and not in the form of extracts or infusion. Stored in dry, ventilated conditions the plant keeps its properties for many years.

Acknowledgment

We are grateful to Prof. Pamela Weathers for her helpful discussions and insightful comments.