



Tropentag, October 5-7, 2011, Bonn

“Development on the margin”

## ***Warburgia Ugandensis* — Bioassay of Different Plant Parts Concerning the Antimicrobial Activity**

BEATRICE GRIEB<sup>1</sup>, JENS GEBAUER<sup>1</sup>, PETER NJOROGE MWANGI<sup>2</sup>

<sup>1</sup>University of Kassel, Organic Plant Production and Agroecosystems Research in the Tropics and Sub-tropics, Germany

<sup>2</sup>Jomo Kenyatta University of Agriculture and Technology (JKUAT), Department of Botany, Kenya

### **Abstract**

The bark of *Warburgia ugandensis* is widely used as an herbal medicine in Kenya and other parts of Africa. It is used against stomach-ache, malaria and is active against different bacterial and fungal infections. However, the intensive use of the bark is severely damaging the trees. In our experiments we used different plant parts to find a less harmful and sustainable way of using the tree.

In 2010 we conducted some bioassay studies in the laboratory of JKUAT (Kenya) to test the inhibition activity of bark, fruit, leaves and root against some potentially stomach upset causing microorganisms (MO), namely *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Bacillus subtilis*, *Escherichia coli* and a fungus *Candida albicans*.

We prepared crude extracts of different concentrations (1, 2, 3, 4, 5 g/100ml) from grounded powder of bark, roots and leaves, as well as fresh fruit. 5mm diameter filter paper discs were impregnated with about 2 $\mu$ l of the extract and placed on the agar plates inoculated with the test MO (100 $\mu$ l). For each test MO, three replicates were prepared for each treatment combination. The plates were incubated at 37°C for 23hrs, after which the diameters of inhibition zones around the paper discs were measured.

The average inhibition zones for leaves (11.21mm), fruits (12.48mm) and roots (13.2mm) were all significantly ( $p < 0.01$ ) larger than the one from bark (10.29mm). The inhibition zone was not always increasing with increasing concentration, bark and leaves showed a peak for 2g/100ml (11.27mm, 12.53mm). Fruits showed two peaks, one at 2g/100ml (13.27mm) and the other at 4g/100ml (13.43mm). The best result was shown by roots at 4g/100ml (14.80mm).

The high potency of roots is a good alternative although less sustainable than leaves and fruits. From our findings we can conclude that crude extract of leaves at 2g /100ml concentration, but also the fruit is good for sustainable utilisation of this medicinal tree at least for infections caused by the tested MO. However, there is further research needed, since our sample size was relatively low and we used the bark of big branches. Healers would use the bark of stem which might give better results.

**Keywords:** Bark, bioassay, crude extracts, herbal medicine, microorganisms, sustainable harvest, traditional medicine, *Warburgia ugandensis*