Article 2

DEVELOPMENT OF GAS CHROMATOGRAPHY-MASS SPECTROMETRY FINGERPRINTS FOR *WARBURGIA UGANDENSIS* HERBAL MATERIALS

ABSTRACT

Warbugia ugandensis (W. ugandensis) is among the 10 most utilised medicinal plants in East Africa. Stem bark and leaves are used as remedies for malaria, stomachache, coughs and skin diseases. Consequently, the plant is endangered because of uncontrolled harvest and lack of domestication. There is therefore fear of poor quality commercialised products due to lack of evaluation mechanisms. This study explored the chemical profiles that could be used to confirm its authenticity and purity. W. ugandensis used as reference during method development was harvested from Kenyatta University Medicinal Plant Research Garden (KUMPRG). Six other samples were obtained from different geographical locations in Kenya. The samples were identified by a botanist and a voucher specimen (MO/002-008/2013) deposited in the East African Herbarium, National Museums of Kenya, Nairobi. Samples were harvested and processed by the World Health Organization (WHO) recommended methods. Chromatographic profiles of the leaf and stem bark were established based on parameters arrived at iteratively. The study characterised over 100 compounds in the leaf and stem bark. Based on area percent and known medicinal value, 22 compounds from the leaf and 38 from the stem bark were selected as major chemical profiles. The compounds in the stem bark included gamma-sitosterol (1.0%–2.5%), squalene (0.2%–4.6%), isolongifolene (1.2%–2.8%), phenol 2-methoxy (0.8%–1.8%) and nerolidol (0.3%–1.5%). Those in the leaf included nerolidol 2 (0.3%–1.1%), phytol (0.6%–1.7%), 2-methoxy phenol (0.2%–2.2%), gamma-tocopherol (0.2%–0.9%), vitamin E (0.4%–1.5%) and gamma-sitosterol (1.8%–4.9%). Most of these compounds were characterised in W. ugandensis for the first time. The profiles therefore can form fingerprints for use to evaluate its quality, purity and authenticity.

Keywords: Chromatographic fingerprints, *Warbugia ugandensis*, Quality