GC-MS analysis of bioactive phytochemicals from methanolic leaf and root extracts of *Tephrosia vogelii*

Stephano Hanolo Mlozi[a,b*], Juma A. Mmongoyo[b] and Musa Chacha[a]

[a]Nelson Mandela African Institution of Science and Technology, School of Life Science and Bioengineering, P.O. Box 447, Arusha, Tanzania

[b]University of Dar es Salaam, Mkwawa University College of Education, Department of Chemistry, P.O. Box 2513, Iringa, Tanzania

*Corresponding author: stephanom7@gmail.com

Abstract

The objective of this study was to determine the phytochemical compounds present in methanolic root and leaf extracts of *Tephrosia vogelii*. The plant species is found in the genus Tephrosia and family Fabaceae. Phytochemical screening was conducted to determine the nature of secondary metabolites while Gas Chromatography-Mass Spectrometry, (GC-MS) was conducted to determine the specific phyto-compounds present in the methanolic root and leaf extracts. Phytochemicals were ascertained based on molecular weights (m/z) acquired from GC-MS chromatograms. Phytocompounds were established through interpretation of spectral peaks and comparing data with stored databases from the National Institute Standard and Technique (NIST) library. Phytochemical screening revealed terpenoids, flavonoids, steroids, tannins and saponins. GC-MS analysis furnished ten phytocompounds. These were; demethylmunduserone (**1**), sumatrol (**2**), hexadecanoic acid, methyl ester (**3**), 5-hydroxy-7-methoxy-2-phenyl-2,3-dihydrochromen-4-one (**4**), (4R,5R,8S,8aS)-5-isopropyl-8-methyl-3-methylene-decahydroazulene-4,5,8-triol (**5**), deguelin (**6**), hexadecanoic acid (**7**), munduserone (**8**), tephrosin (**9**), and 7-hydroxy-5-methoxy-8-(3-methylbut-2-enyl)-2-phenyl-2,3-dihydrochromen-4-one (**10**). This study reports compounds **1, 2, 3, 7** and **8** for the first time from this species. Evidently, the reported pharmacological properties of these phytochemicals support the ethnomedical use of *T. vogelii* for the traditional health care exclusively in the treatment of diseases such as fungal and bacterial, inflammatory, and cancer diseases, as well as the management of pests and ecto-parasites. Phytochemical components identified in this study advocate the presence of ethnomedical and phytopharmaceutical versality of *T. vogelii* that could be used in the antimicrobial drug formulation studies.

Key words: *Tephrosia vogelii*, medicinal plants, bioactives, GC-MS analysis, phytochemicals