

Full Length Research Paper

Antibacterial saponins from the leaves of *Polyscias fulva* (Araliaceae)

Winnie Cherotich Maritim^{1*}, Isabel Nyokabi Wagara² and Josphat Clement Matasyoh³

¹Department of Chemistry, Egerton University, P. O. Box 536, Egerton - 20115, Kenya.

²Department of Biological Sciences, Egerton University, P. O. Box 536, Egerton - 20115, Kenya.

³Department of Chemistry, Egerton University, P.O. Box 536, Egerton - 20115, Kenya.

Received 16 April, 2018; Accepted 14 June, 2018

Saponins are a major family of secondary metabolites that occur in a wide range of plant species. Bioassay - guided fractionation of extract of the leaves of *Polyscias fulva* led to the isolation of three known saponins named, 3-O- α -L-arabinopyranosyl-hederagenin (1), 3-O-[α -L-rhamnopyranosyl(1-2)- α -L-arabinopyranosyl]-hederagenin (2) and 3-O-[rhamnopyranosyl-(1 \rightarrow 2)-xylopyranosyl]-Olean-12-en-28-O-[rhamnopyranosyl-(1 \rightarrow 4)-glucopyranosyl-(1 \rightarrow 6-glucopyranosyl)] ester (3). Leaves of the plant were collected from Kakamega rain forest in Kenya, dried under shade and ground into fine powder and extraction was done using methanol. The methanol extract was subjected to column chromatography and the fractions purified using preparative high performance liquid chromatography (HPLC). The bioactivity of the pure compounds was done using disc diffusion method. The three compounds exhibited moderate activities against Gram positive bacterium (*Staphylococcus aureus* ATCC25922) and Gram negative bacterium (*Klebsiella pneumoniae* ATCC13883). Compound 1 was found to be the most active against *K. pneumoniae* (8.00 \pm 1.00 mm) and *S. aureus* (10.00 \pm 1.73 mm) followed by compound 2 with inhibition zones of 7.66 \pm 0.57 and 7.33 \pm 0.57 mm against *K. pneumoniae* and *S. aureus*, respectively. Compound 3 was the least active against both *K. pneumoniae* (7.33 \pm 0.57 mm) and *S. aureus* (7.00 \pm 1.00 mm). The results obtained indicate that compounds 1, 2 and 3 exhibit potential as possible sources of antibacterial agents.

Key words: Antibiotics, bacterial infections, antibiotic resistance, *Polyscias fulva*, saponins.

INTRODUCTION

Saponins are a major family of secondary metabolites that occur in a wide range of plant species (Hostettman et al., 1995). They are naturally occurring glycosides characterized by their strong foam forming property in aqueous solution (Gl-stndag and Mazza, 2007; Man et al., 2010; Negi et al., 2013). Various members of this important family of plant secondary metabolites are

exploited commercially for a variety of purposes including drugs and medicines, precursors for hormone synthesis, adjuvants, foaming agents, sweeteners, taste modifiers and cosmetics. Since many saponins have potent antimicrobial activity, the natural role of these molecules in plants is likely to be in conferring protection against attack by potential pathogens (Morrissey and Osbourn,

*Corresponding author. E-mail: maritimwinnie89@yahoo.com. Tel: +254728054560.