

## GC-MS profile and antimicrobial activities of extracts from root of *Senna occidentalis* Linn.

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**Abstract.** We considered the extraction of plant materials from *Senna occidentalis* root, and its fractionation monitored by bioassay towards isolating its bioactive principles. Pulverized root sample of *Senna occidentalis* (fam. leguminaceae) was extracted with methanol using a maceration method. The crude methanol extract (MSo) 6.06 g was partitioned into petroleum ether and ethyl acetate to yield their respective fractions viz: petroleum ether fraction (1.20 g), ethyl acetate fraction (1.86 g) and methanol fraction (2.92 g). The crude methanol extract was analyzed using phytochemical screening, infrared spectroscopy, and gas chromatography/mass spectrometry while the fractions were examined for antimicrobial properties. Phytochemical screening indicated the presence of tannins, phenolics, alkaloids, flavonoids, saponins, cardiac glycosides, phlobatannin, and absence of steroids. The infrared spectrum revealed a broad absorption band at 3437.26  $\text{cm}^{-1}$  due to O-H symmetric stretch in polymeric alcohols, and absorption frequency of 1640.51  $\text{cm}^{-1}$  of moderate intensity due to C=O stretch. Enols are easily identified by the broad H-bonded O-H stretch absorption and low C=O stretch frequency as in  $\beta$ -keto enolic esters and phenol acetates, -CO-O-C=C-, (1690-1650  $\text{cm}^{-1}$ ). Gas chromatography/mass spectrometry identified the presence of ten compounds including *n*-hexadecanoic acid (23.76%), linoleic acid (1.64%), E-9-tetradecenoic acid (4.88%), octadecanoic acid, 2-(2 hydroxyethoxy) ethyl ester (6.24%) and E-2-octadecadecen-1-ol (13.74%). Similar broad spectrum antimicrobial activities were manifested by methanol and ethyl acetate fractions. *Escherichia coli* and *Bacillus cereus* were the most susceptible with the highest zone of inhibition of 30 mm and 28 mm respectively at minimum inhibition concentration of  $1.35 \times 10^3 \mu\text{g/ml}$ . The methanol fraction has the highest potency against the tested pathogens whereas the petroleum ether fraction exhibited activity only on gram negative pathogens. The antimicrobial activities observed in these fractions suggest the presence of active chemical components in the crude methanol root extract of *Senna occidentalis* thus provides a potential source of novel antimicrobial agents. Further work is however, required to isolate and characterize these bioactive principles.

**Keywords:** *Senna occidentalis* Linn.; gas chromatography/mass spectrometry; bioactive principles; fatty acids; antimicrobial activity.

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