Review Article

International Journal of Research in Pharmaceutical Sciences

Published by JK Welfare & Pharmascope Foundation Journal Home Page: https://ijrps.com

Chemical properties, biological activities and ethnomedicinal uses of *Maerua pseudopetalosa*: A famine food species of tropical Africa

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Article History:

Received on: 07 Sep 2020
Revised on: 12 Oct 2020
Accepted on: 16 Oct 2020

Keywords:

Capparaceae, indigenous pharmacopeia, Maerua pseudopetalosa, traditional medicine

Abstract

Maerua pseudopetalosa (Gilg & Gilg-Ben.) DeWolf is a perennial herb or subshrub collected from the wild as a food plant or traditional medicine. *Maerua pseudopetalosa* occurs naturally from Senegal, east to Eritrea and Ethiopia, through South Sudan, Sudan, East Africa, south to the Democratic Republic of Congo (DRC). This study is aimed at evaluating the chemical properties, biological activities and ethnomedicinal uses of *M. pseudopetalosa*. Results of the current study are based on data derived from several online databases such as Scopus, Google Scholar, PubMed and Science Direct, and pre-electronic sources such as scientific publications, books, dissertations, book chapters and journal articles. This study revealed that the fruit, leaf and root infusion and/or decoction of *M. pseudopetalosa* are mainly used as a stimulant and to restore physical strength and vitality, and traditional medicine for chest pains, breast cancer and cough. Phytochemical compounds identified from aerial parts, fruits, roots, seeds and tubers of *M. pseudopetalosa* include quaternary ammonium compounds, alkaloids, amino acids, betaines, cardiac glycosides, fatty acids, essential oils, flavonoids, phenolics, sterols and tannins. Preliminary ethnopharmacological research revealed that aerial parts, roots and tubers of *M. pseudopetalosa* have antibacterial, antifungal, antihyperglycemic, antioxidant, α-glucosidase inhibitory, pancreatic lipase inhibitory and cytotoxicity activities. *Maerua pseudopetalosa* should be subjected to detailed phytochemical, pharmacological and toxicological evaluations aimed at correlating its medicinal uses with its phytochemistry and pharmacological properties.

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ISSN: 0975-7538

DOI: https://doi.org/10.26452/ijrps.v11i4.4686

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INTRODUCTION

Maerua pseudopetalosa (Gilg & Gilg-Ben.) DeWolf is a perennial woody herb or a subshrub belonging to the Capparaceae or caper family. The Capparaceae family is a tropical and subtropical taxon of trees, shrubs, herbs and lianas consisting of approximately 417 species (Kers and Capparaceae, 2003; Iltis *et al.*, 2011). The genus *Maerua* Forssk. has been recorded in tropical and southern Africa and tropical Asia with about 60 species recorded from the African continent (Wild and Capparidaceae, 1960; Elfers *et al.*, 1964). *Maerua* species are widely used in tropical Africa as food sources and traditional medicines. The fruits and leaves of *M. angolensis* DC. are considered edible throughout the distributional range

of the species in tropical Africa (Homewood *et al.*, 1993; Achigan-Dako *et al.*, 2010). Similarly, the leaves of *M. crassifolia* Forssk. are consumed as a leafy vegetables and traded locally for this purpose in Burkina Faso, Chad, Ethiopia, Kenya, Mali, Mauritania, Niger, Nigeria and Sudan (Morgan, 1981; Lulekal *et al.*, 2011). Other *Maerua* species characterized by edible fruits and roots, used as leafy vegetables and traditional medicines include *M. denhardtiorum* Gilg, *M. edulis* (Gilg & Gilg-Ben.) DeWolf, *M. juncea* Pax, *M. oblongifolia* (Forssk.) A. Rich., *M. schinzii* Pax and *M. triphylla* A. Rich. (Bosch *et al.*, 2013; Kamali, 2014). The stems of *M. pseudopetalosa* grow from a tuberous and thickened rootstock and the species can grow up to 60 cm in height (Elfers *et al.*, 1964). The leaves of *M. pseudopetalosa* are simple, elliptic to lanceolate in shape and rounded at the base. The flowers are many, borne singly in the upper leaf axils. The fruit is globose or ovoid cylindric in shape. The synonyms associated with the name *M. pseudopetalosa* include *Courbonia pseudopetalosa* Gilg & Gilg-Ben. and *Courbonia virgata* A. Brongn (Elfers *et al.*, 1964). *Maerua pseudopetalosa* has been recorded in deciduous bushland and grassland with scattered trees and often on termite mounds. *Maerua pseudopetalosa* has been recorded in Benin, Burkina Faso, Cameroon, Central African Republic, Chad, the Democratic Republic of Congo, Eritrea, Ethiopia, Ghana, Kenya, Mali, Nigeria, Senegal, South Sudan, Sudan and Uganda at an altitude ranging from 700 m to 1350 m above sea level (Elfers *et al.*, 1964; Akoègninou *et al.*, 2006). The leaves, fruits, roots and seeds of *M. pseudopetalosa* are eaten in Ethiopia, Senegal and Sudan, particularly during drought and periods of food shortages, and roots are used to make a non-alcoholic beverage (Uphof, 1968; Manal and Manal, 2019). The roots of *M. pseudopetalosa* are widely used in Sudan to purify and reduce the turbidity of water (Sulaiman *et al.*, 2015). The foliage of *M. pseudopetalosa* is browsed by livestock and game (Ibrahim *et al.*, 2015). *Maerua pseudopetalosa* is one of the important medicinal plants in tropical Africa, and the species is included in the book "Plant resources of tropical Africa 11(2): Medicinal plants 2", a photographic guide to the most commonly used medicinal plants in tropical Africa. Therefore, *M. pseudopetalosa* is a valuable plant species with the potential for improving food and nutritional security and primary healthcare of local communities in tropical Africa. Thus, the aim of this review is to provide an integrated and detailed appraisal of the existing knowledge on the chemical properties, biological activities and ethnomedicinal uses of *M. pseudopetalosa*.

MATERIALS AND METHODS

Results of the current study are based on a literature search on the chemical properties, biological activities and ethnomedicinal uses of *M. pseudopetalosa* using information derived from several internet databases. The databases included Scopus, Google Scholar, PubMed and Science Direct. Other sources of information used included pre-electronic sources such as journal articles, theses, books, book chapters and other scientific articles obtained from the University library.

RESULTS AND DISCUSSION

Medicinal uses of *Maerua pseudopetalosa*

The fruit, leaf and root infusion and/or decoction of *M. pseudopetalosa* are mainly used as a stimulant and to restore physical strength and vitality, and traditional medicine for chest pains, breast cancer and cough (Table 1; Figure 1). Other medicinal applications of *M. pseudopetalosa* recorded in a single country and based on a single literature record include the use of fruit, leaf and root infusion and/or decoction as a tonic and traditional medicine for diabetes, hypertension, kidney problems, pulmonary problems, sexual debility, scorpion and snake bites.[49–51]

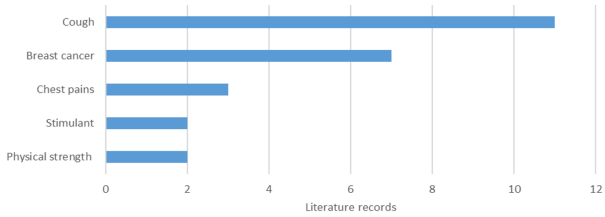

Figure 1: Medicinal applications of *Maerua pseudopetalosa* derived from literature records

Nutritional and phytochemical composition of *Maerua pseudopetalosa*

Researchers such as Ayessou *et al.* (2009); Bukhari *et al.* (2017) investigated the nutritional properties of *M. pseudopetalosa* fruits and seeds (Table 2). A wide variety of nutrients associated with different plant parts of *M. pseudopetalosa* (Table 2) imply that the species could be a source of health-promoting nutrients such as calcium, carbohydrates, copper, crude fibre, fat, iron, magnesium, phosphorus, potassium, proteins, sodium and zinc. Based on these research findings, the fruits of *M. pseudopetalosa* could serve as a good supplement for nutrients such as carbohydrates, crude fibre, fat proteins and vitamin C to complement the stipulated requirements for the recommended dietary allowance (RDA) values. Phytochemical compounds identified from the aerial parts, fruits, roots, seeds,

Table 1: Medicinal uses of *Maerua pseudopetalosa*

Medicinal use	Parts used	Country	Reference
Breast cancer	Tuberous root infusion and/or decoction taken orally	Sudan	(Sulaiman *et al.*, 2015; Dirar *et al.*, 2019)
Chest pains	Fruit, leaf and root infusion and/or decoction taken orally	Nigeria	(Odugbemi, 2006; El-Ghani, 2016)
Cough	Fruit, leaf and root infusion and/or decoction taken orally	Nigeria and Sudan	(Odugbemi, 2006; Manal and Manal, 2019)
Diabetes	Root infusion taken orally	Sudan	(Issa *et al.*, 2018)
Hypertension	Root infusion taken orally	Sudan	(Issa *et al.*, 2018)
Kidney problems	Root infusion taken orally	Sudan	(Issa *et al.*, 2018)
Physical strength	Fruit infusion and/or decoction taken orally	Sudan	(Doka, 2001; Manal *et al.*, 2015)
Pulmonary problems	Root infusion taken orally	Sudan	(Inas *et al.*, 2016)
Sexual debility	Root infusion taken orally	Sudan	(Issa *et al.*, 2018)
Scorpion and snake bites	Root decoction applied topically	Ethiopia	(Yirgu and Chippaux, 2019)
Stimulant	Fruit, leaf and root infusion and/or decoction taken orally	Nigeria	(Odugbemi, 2006; El-Ghani, 2016)
Tonic	Fruit infusion taken orally	Sudan	(Inas *et al.*, 2016)

tubers and whole plant parts of *M. pseudopetalosa* include alkaloids, amino acids, betaines, cardiac glycosides, fatty acids, essential oils, flavonoids, phenolics, quaternary ammonium compounds, sterols and tannins.

Pharmacological properties of *Maerua pseudopetalosa*

The following pharmacological activities have been documented from the aerial parts, roots and tubers of *M. pseudopetalosa*: antibacterial, antifungal, antihyperglycemic, antioxidant, α-glucosidase inhibitory, pancreatic lipase inhibitory and cytotoxicity activities.

Antibacterial activities

Ibrahim *et al.* (2015) evaluated the antibacterial activities of chloroform, ethyl acetate and ethanol extracts of the aerial parts, roots and tubers of *M. pseudopetalosa* against *Bacillus cereus, Escherichia coli, Staphylococcus aureus* and *Salmonella typhi* using the agar diffusion method. The extracts exhibited activities against tested pathogens with the inhibition zone ranging from 12.0 mm to 21.0 mm (Manal *et al.*, 2015).

Antifungal activities

Manal *et al.* (2015) evaluated the antifungal activities of chloroform, ethyl acetate and ethanol extracts of the aerial parts, roots and tubers of *M. pseudopetalosa* against *Aspergillus fumigatus Aspergillus flavus* and *Candida albicans* using the agar diffusion method. The extracts exhibited activities against tested pathogens (Manal and El, 2015).

Antihyperglycemic activities

Sulaiman *et al.* (2015) evaluated the antihyperglycemic activities of 80.0% ethanol extract of *M. pseudopetalosa* roots in glucose-loaded Wistar albino rats and dose of 0.1% of the extract in glucose uptake by using isolated rats hemidiaphragms. The activities of doses of 100.0, 200.0 and 400.0 mg/kg body weight were assessed after administering the fasting rats with glucose. These activities were compared with control rats administered with the vehicle and standard group administered with glibenclamide at a dosage of 10.0 mg/kg body weight. The extract exhibited activities and enhanced re-uptake of glucose when used together with insulin in isolated rat hemidiaphragm (Sulaiman *et al.*, 2015).

Antioxidant activities

Manal and Manal (2019) evaluated the antioxidant activities of the ethanolic fractions of *M. pseudopetalosa* tubers using 1,1-diphenyl-2-picryl-hydrazyl (DPPH) and 2,2′-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) diammonium (ABTS) free radical scavenging assays. The fractions exhibited activities ranging from 70.8% to 91.3% by DPPH and 80.2% to 97.0% by ABTS (Manal and Manal, 2019).

Table 2: Nutritional and phytochemical composition of *Maerua pseudopetalosa*

Nutritional or phytochemical component	Value	Plant part	Reference
Nutritional component			
Ash (%)	0.3 – 2.9	Seeds	(Bukhari *et al.*, 2017)
Calcium (mg/100g)	0.3 – 0.7	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Carbohydrates (g/100g)	65.6 – 73.2	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Copper (mg/100g)	0.2 – 0.3	Seeds	(Bukhari *et al.*, 2017)
Energy (kcal/100g)	375.8 – 446.9	Fruits	(Ayessou *et al.*, 2009)
Fat (g/100g)	5.2 – 7.8	Fruits	(Ayessou *et al.*, 2009)
Fibre (%)	1.4 – 4.3	Seeds	(Bukhari *et al.*, 2017)
Iron (mg/100g)	0.09 – 2.5	Seeds	(Bukhari *et al.*, 2017)
Magnesium (mg/100g)	5.0 – 16.6	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Manganese (mg/100g)	0.08 – 0.09	Seeds	(Bukhari *et al.*, 2017)
Moisture (%)	8.3 – 9.6	Seeds	(Bukhari *et al.*, 2017)
Nitrogen (g/100g)	3.3 – 4.4	Fruits	(Ayessou *et al.*, 2009)
Phosphorus (mg/100g)	1.0 – 3.1	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Potassium (mg/100g)	11.0 – 250.8	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Protein (%)	11.6 – 22.1	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Sodium (mg/100g)	1.0 – 5.7	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Zinc (mg/100g)	1.4 – 2.1	Seeds	(Bukhari *et al.*, 2017)
Phytochemical component			
Amino acids			
Alanine (mg/100g)	335.1 – 600.0	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Arginine (mg/100g)	302.4 – 392.3	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Asparagine (g/100g)	3.5 – 5.6	Fruits	(Ayessou *et al.*, 2009)
Aspartic acid (mg/100g)	289.7 – 750.5	Seeds	(Bukhari *et al.*, 2017)
Cystine (mg/100g)	43.0 – 44.0	Seeds	(Bukhari *et al.*, 2017)
Cysteine (g/100g)	0.02 – 0.7	Fruits	(Ayessou *et al.*, 2009)
Glutamine (g/100g)	0.9 – 1.6	Fruits	(Ayessou *et al.*, 2009)
Glutamic acid (mg/100g)	136.6 – 214.5	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Glycine (mg/100g)	12.6 – 24.0	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Histidine (mg/100g)	14.4 – 23.5	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Isoleucine (mg/100g)	245.0 – 330.8	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Leucine (mg/100g)	140.5 – 282.0	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Lysine (mg/100g)	32.1 – 76.1	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Methionine (mg/100g)	11.9 – 16.9	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)

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Table 2 continued

Nutritional or phytochemical component	Value	Plant part	Reference
Phenylalanine (mg/100g)	192.6 – 242.9	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Proline (mg/100g)	427.2 – 532.0	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Serine (mg/100g)	49.9 – 63.0	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Threonine (mg/100g)	47.9 – 66.2	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Tyrosine (mg/100g)	26.8 – 89.8	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Valine (mg/100g)	255.9 – 347.8	Fruits and seeds	(Ayessou *et al.*, 2009; Bukhari *et al.*, 2017)
Quaternary ammonium compounds			
3-hydroxyprolinebetaine	-	Aerial parts and branches	(McLean *et al.*, 1996)
3-hydroxy-1,1-dimethyl prrolidinium	-	Aerial parts and branches	(McLean *et al.*, 1996)
Glycinebetaine	-	Aerial parts and branches	(McLean *et al.*, 1996)
Prolinebetaine	-	Aerial parts and branches	(McLean *et al.*, 1996)
Prolinebetaine ethyl ester	-	Aerial parts and branches	(McLean *et al.*, 1996)
Tetramethylammonium	-	Aerial parts and roots	(Henry and Grindley, 1949; McLean *et al.*, 1996)
Other phytochemical compounds			
(-)-stachydrine ethyl ester periodide	-	Roots	(Henry and King, 1950)
Tannins (mg/100g)	0.02	Seeds	(Bukhari *et al.*, 2017)
Polyphenols (mg/100g)	160.0 – 170.0	Seeds	(Bukhari *et al.*, 2017)
Total flavonoid content (mg of quercetin equivalent/g)	0.2 – 22.6	Roots	(Dirar *et al.*, 2019)
Total phenolic content (mg of gallic acid equivalent/g)	5.6 – 13.1	Roots	(Dirar *et al.*, 2019)
Phytic acid (mg/100g)	588.9 – 743.5	Seeds	(Bukhari *et al.*, 2017)
cis-3-hydroxystachydrine	-	Fruits	(Cornforth and Henry, 1952)
trans-3-hydroxystachydrine	-	Fruits	(Cornforth and Henry, 1952)
Stearic acid (%)	1.0	Tubers	(Ibrahim *et al.*, 2015)
Hexadecanoic acid, ethyl ester (ethyl palmitate) (%)	7.1	Tubers	(Ibrahim *et al.*, 2015)
Ethyl linoleate (%)	45.5	Tubers	(Ibrahim *et al.*, 2015)
Ethyl oleate (%)	37.1	Tubers	(Ibrahim *et al.*, 2015)
Propanol,2,3-dihydroxy/ glycerose (%)	5.1	Tubers	(Ibrahim *et al.*, 2015)

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Table 2 continued

Nutritional or phytochemical component	Value	Plant part	Reference
3-Pyridinecarboxylic acid 1,2,5,6-tetrahydro-1-methyl-methyl ester (%)	8.0	Tubers	(Ibrahim *et al.*, 2015)
2-Furancarboxaldehyde,5-(hydroxyl- methyl) (%)	58.5	Tubers	(Ibrahim *et al.*, 2015)
Ethyl linoleate (%)	12.3	Tubers	(Ibrahim *et al.*, 2015)
Ethyl oleate (%)	9.6	Tubers	(Ibrahim *et al.*, 2015)
Methanamine,N-(3-methyl-2-butenylidene (%)	15.3	Tubers	(Ibrahim *et al.*, 2015)
Cyclobutanone,2,3,3,4-tetramethyl (%)	27.4	Tubers	(Ibrahim *et al.*, 2015)
Morpholine,4-(2-methyl-1propenyl (%)	22.6	Tubers	(Ibrahim *et al.*, 2015)
5-hydroxy piperidine carboxylic acid (%)	9.7	Tubers	(Ibrahim *et al.*, 2015)
2-(E)-Hexenoic acid,(4S)-amino-5-methyl (%)	6.1	Tubers	(Ibrahim *et al.*, 2015)
Methanamine,N-(3-methyl-2-butenyliden (%)	19.1	Tubers	(Ibrahim *et al.*, 2015)
N,N-Dimethyl-1,3-butadien-1-amine (%)	29.1	Tubers	(Ibrahim *et al.*, 2015)
Hygrine/2-propanone,1-(methyl-2-pyrrolidinyl)-,(R) (%)	11.3	Tubers	(Ibrahim *et al.*, 2015)
Morpholine,4-(2-methyl-1-propenyl) (%)	7.4	Tubers	(Ibrahim *et al.*, 2015)
9,12-Octadecadienoic acid (Z, Z)-, methyl ester (%)	10.6	Roots	(Inas *et al.*, 2016)
9-Octadecenoic acid, methyl ester, (E)- (%)	7.7	Roots	(Inas *et al.*, 2016)
Oleic acid (%)	24.5	Roots	(Inas *et al.*, 2016)
1-(+)-Ascorbic acid 2,6-dihexadecanoate (%)	5.1	Roots	(Inas *et al.*, 2016)
Cyclododecyne (%)	6.1	Roots	(Inas *et al.*, 2016)
9-Octadecenoic acid,1,2,3-propanetriyl ester (%)	9.6	Roots	(Inas *et al.*, 2016)
γ-Sitosterol (%)	8.6	Roots	(Inas *et al.*, 2016)
Gallic	-	Tubers	(Manal and Manal, 2019)
Syringic acid	-	Tubers	(Manal and Manal, 2019)
Caffeic acid	-	Tubers	(Manal and Manal, 2019)
Sinapic acid	-	Tubers	(Manal and Manal, 2019)

α-glucosidase inhibitory activities

Dirar *et al.* (2019) evaluated the α-glucosidase inhibitory activities of water, acetone, dichloromethane, 50%, 70% and 95% ethanol extracts of *M. pseudopetalosa* roots using a sensitive spectrophotometric assay with acarbose as a positive control. The 70% ethanol extract exhibited activities with a half-maximal inhibitory concentration (IC_{50}) value of 37.9 μg/ml in comparison to the IC_{50} value of 363.7 μg/ml exhibited by the positive control (Dirar *et al.*, 2019).

Pancreatic lipase inhibitory activities

Dirar *et al.* (2019) evaluated the pancreatic lipase inhibitory activities of water, acetone, dichloromethane, 50%, 70% and 95% ethanol extracts of *M. pseudopetalosa* roots by measuring the release of 4-methylumbelliferone (4MUF) from the substrate 4-methylumbelliferyl oleate (4MUFO) with cetilistat as a positive control. The water, acetone, dichloromethane and 95% ethanol extracts exhibited activities with IC_{50} values ranging from 1.0 μg/ml to 13.8 μg/ml in comparison to the IC_{50} value of 4.4 μg/ml exhibited by the positive control (Dirar *et al.*, 2019).

Cytotoxicity activities

Manal and El (2015) evaluated the cytotoxicity activities of ethyl acetate and ethanol extracts of the tuber parts of *M. pseudopetalosa* using the brine shrimp lethality assay. The ethanol extract exhibited the best activities with median lethal concentration (LC_{50}) values as low as 0.4 μg/ml (Ibrahim and El Nur, 2015). Ibrahim and Ramadan (2019) evaluated the cytotoxicity activities of the ethanolic fractions of *M. pseudopetalosa* tubers against MCF-7 cell lines using 3-(4,5-dimethyl-2- thiazolyl)-2,5-diphenyl-2H-tetrazolium bromide (MTT) assay. The fractions exhibited activities against MCF-7 cell lines with the best IC_{50} value of 43.5 μg/g after 72 hours (Manal and Manal, 2019).

Toxicity activities

Ibrahim *et al.* (2015) evaluated the toxicity activities of ethyl acetate and ethanol tuber extracts of *M. pseudopetalosa* on the liver and heart of Wistar rats. The extracts were administered at 50.0 mg/kg, 250.0 mg/kg and 500.0 mg/kg body weight for one week. A daily dose of 500.0 mg/kg body weight of ethanol extract lead to mortalities in the second day. Liver sections of rats given ethanolic extract at 50.0 mg/kg body weight showed loss of hepatocyte nuclei, nuclear pyknosis and cytoplasmic acidophilia. Cytoplasmic vacuolation and dilated sinusoids were seen in liver sections of rats given 500.0 mg/kg body weight dose of ethyl acetate extract. The extracts caused mild hepatic or myocardial changes in Wistar rats. Manal *et al.* (2015); Ibrahim *et al.* (2015) evaluated the toxicity activities of ethyl acetate and ethanol tuber extracts of *M. pseudopetalosa* on body weight and serum biochemical parameters of Wistar rats. The extracts were administered at 50.0 mg/kg, 250.0 mg/kg and 500.0 mg/kg body weight for one week. Rats given ethanolic extract exhibited increased alanine aminotransferase activity and albumin concentration, and direct bilirubin compared to the control. Mortality occurred in the 500.0 mg/ kg body weight dose group. Rats given ethyl acetate extract showed higher aspartate aminotransferase in comparison to the control. Administration of the extracts showed that the 250.0 mg/kg bodyweight concentration was to reduce the Wistar rats body weight, and therefore, *M. pseudopetalosa* possess slight toxicity (Ibrahim *et al.*, 2015).

CONCLUSION

Maerua pseudopetalosa is known to be poisonous and there is a need for detailed clinical and toxicological evaluations of crude extracts and compounds isolated from the species. Therefore, the widespread use of *M. pseudopetalosa* as a food plant and source of traditional medicines throughout its distributional range suggest that the species is not taken at toxic dosages. But the use of *M. pseudopetalosa* as food and for the treatment of human diseases and ailments should be treated with caution, and rigorous toxicological and clinical studies of the bark, fruits, leaves, roots, seeds, tubers and compounds isolated from the species are necessary.

ACKNOWLEDGEMENT

I am grateful to the reviewers who kindly commented on my manuscript.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

Funding Support

The authors declare that they have no funding support for this study.

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