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Research Article

Phytochemical and Pharmacological Activities of *Moringa peregrina*-A Medicinal Plant

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Abstract

The most well-known species of *Moringa* is *Moringa peregrina*, which belongs to the family Moringaceae. It is a small deciduous tree, 6 - 10m tall, with large leaves and thin pendulous branches, ranges across northeastern Africa and southwestern Asia. It grows on the rocky slopes of wadis. *Moringa peregrina* has traditionally been used for home construction and fires, and its leaves are consumed as food and livestock feed. In many countries, oil extracted from pods was used in traditional medicine and in perfumery. *M. peregrina* has recently attracted more attention because of its traditional, nutritional, industrial, and therapeutic uses. Due to the plant's wide range of medicinal applications, it has recently been tested for several pharmacological activities.

Keywords: *Moringa peregrina; Pharmacological Activities; Medicinal Applications*

Introduction

Various parts of the *Moringa peregrina* plant have been used in traditional folk medicine for a wide range of ailments, including fever, pain, inflammation, diabetes, stomach disorders, and skin problems. Scientific studies have investigated and confirmed many of these properties, identifying the plant as a source of antioxidants, as well as anti-inflammatory, antimicrobial, and anti-diabetic compounds.

Classification

Scientific Name: *Moringa peregrina* Fiori.

Synonymy Name: *Hyperanthera peregrina* Forssk.

Local Name: Shu'a.

Arabic Name: Alban, Yasar, Baan, Leban, Alleban, Alhaba Alghaliah.

Common Name: Ben tree, Wispy-needled yasar tree, Wild drumstick tree.

Family: Moringaceae.

Figure

Plant part name: *Moringa peregrina* (Leaves)

Description	Green fresh leaves
Discussion	Recently, *M. peregrina* is gaining more attention due to traditional, nutritional, industrial and medicinal values. As this plant has wide range of medicinal uses, it has been screened for various pharmacological activities in the past few decades [1-15]. Few active molecules were also isolated, identified and reported for various pharmacological activities.
Chromatographic Studies	The green leaves were dried at room temperature and powdered. Different mobile phases were used to develop the thin layer chromatograms using petrol/acetone, methanol extracts. The following compounds were identified in the 'leaves' 'taken in above solvents and on comparison with reference standards on TLC studies and GCMS analysis.
Phytochemical compounds	Sucrose Tetratriacontane Glucose Linolenin, 1-mono Flavonoids Chlorogenic acid Stigma sterol Beta Sitosterol Pyrocatechol Methyl commmate D Xanthosine Iso octylvinyl ether Levoglucosan Oleic acid chloride Quinic acid Ethyl iso-allocholate Pentose Hexahydrofarnesol Vitamin E 2, 3-Dihydro benzofuran Phytol Methyl-3-Hydroxy caproate Palmitic acid Palmitic acid methyl ester Octadecanal Dihomo gamma linolenic acid Guanosine Hexatricosyl pentafluoropropionate 1-Octacosanal Octatriacontylpentafluoropropionate Oleic acid Ethyl-1-thio-alpha-l-arabinofuranoside Pyrocatechol Cis, Cis, Cis-7, 10, 13-Hexadecatrienal Acetin-1-mono 2-Hydroxy-5-methyl iso-phthaladehyde 7-Tetradecenol 3, 7, 11, 15-Tetremethyl-2-hexadecane-1-ol Myristic acid 4H-Pyran-4one-2, 3-dihydro-3, 5-dihydroxy-6-methyl

Elements (Conc. in ppm)	Total Ash: 8.0----9.0% Calcium (Ca): 7109.250----7229.750 ppm Potassium (K): 11048.500---11962.500 ppm Total Fat: 20.0----21.6% Protein: 6.6----8.22% Vitamin A: 5.50---6.80 mg/100g Vitamin C: 82.68---83.0 mg/100g 

Table A

Plant part name: *Moringa* species (Fruits-Pods with seeds)

Description	Green fresh fruits
Chromatographic studies	The green fruits were dried at room temperature and powdered. Different mobile phases were used to develop the thin layer chromatograms using petrol/ acetone, methanol extracts. The following compounds were identified in the 'fruits 'taken in above solvents and on comparison with reference standards on TLC studies and GCMS analysis.
Phytochemical compounds	Sucrose 1--Octacosanal Glucose Gamma Sitosterol Flavonoids Gamma Tocopherol Ascorbic acid Tetratetracontane Dodecane 2-Deoxy galactose Phytol Palmitin, 2-mono Palmitic acid Stigmasterolal Stearic acid Chlorogenic acid Vitamin E 1, 2-dipalmitin 1-Eicosanal Oleic acid chloride Penta decanal Oleic acid methyl ester Octa decanal Stearic acid methyl ester Heneicosane 5-Hydroxymethylfurfural Guanosine 22, 23-Dihydrobrassicasterol Levoglucosan 2-Hexadecenoic acid (Trans) Squalene Oleic acid, trimethylsilyl ester Oleylaldyde Ethyl-1-thio-alpha-l-arabinofuranoside Oleic acid 4H-Pyran-4-one-2, 3-dihydro-3, 5-dihydroxy-6-methyl

Elements: (Conc. in ppm)	Total Ash: 7.5-----8.0% Calcium (Ca): 5326.250-----5464.750 ppm Potassium(K): 15549.750----15736.750 ppm Total Fat: 1.6------3.5% Protein: 16.66---20.0% Vitamin A: 20.853-----22.692 mg/100g Vitamin C: 140.67-----141.0 mg/100g

Table B

Methodology Details

The Soxhlet extraction technique was used for extraction, which is highly efficient for the extraction of a wide range of bioactive compounds. The continuous cycling of the polar solvent acetone through the sample ensures a thorough extraction process and repeated exposure of the solid material to fresh solvent. The low temperature used during the extraction process to avoid degradation of some heat-sensitive compounds. The yield was 70%, which was satisfactory.

The optimum dosage for Moringa was found to be in the range of 2000 - 4000 mg/L. The optimum dosage of 3000 mg/L *Moringa oleifera* in dry powder form reduced the initial CST from 6.8 to 5.6s.

Quantification of major compounds in *Moringa peregrina* reveals a rich profile of polyphenols, flavonoids, and nutritional components, with concentrations heavily influenced by part of the plant, geographical origin, and extraction methods.

The analytical data revealed that the leaves and seeds of the *M. peregrina* (Forssk.) Fiori contain sufficient amounts of Vitamin C: 83 ± 0.5 and 14 ± 0.6 mg/100 g/DW; and Vitamin A: 6.8 ± 0.7 and 24.8 ± 0.7 mg/100 g/DW, respectively. The elemental analysis in the leaves and seeds showed that the calcium content are 764.8 ± 1.6 and 1164.8 ± 43.4 mg/100 g/DW and for potassium content are 900.2 ± 14 and 572 ± 10 mg/100 g/DW, respectively.

Pharmacological activities

Recently, *M. peregrina* is gaining more attention due to traditional, nutritional, industrial and medicinal values. As this plant has wide range of medicinal uses, it has been screened for various pharmacological activities in the past few decades [1-15]. Few active molecules were also isolated, identified and reported for various pharmacological activities.

Anti-gastric ulcer activity of *Moringa peregrina* studied in two models of rats (80% ethanol and NaOH) induced ulcer.

Introduction

A peptic ulcer is a sore in the lining of the stomach or the first part of the small intestine. Ulcers in the stomach are called gastric ulcers, and those in the upper small intestine are called duodenal ulcers. It is induced in laboratory animals by using different chemicals (80% ethanol, 0.6M HCL, 0.2M NaOH and 25% NaCl) and drugs (indomethacin, aspirin and reserpine) beside hypothermic restraint stress and by pylorus ligated Shay rat technique. Symptoms include pain, nausea, vomiting, and heartburn; in serious cases, ulcers may cause bleeding into the stomach or perforation of the gastrointestinal wall.

Preparations

Animals

Wistar albino (WI) strain rats (250 - 300 g.BW) housed as an outbred closed colony in animal facility kept in Makrolon Polycarbonate cages (41×28×24 cm) with a high top wire lid and bottles with nozzles; sawdust bedding material changed twice a week. Maintaining

standard condition of 22 ± 2°C room temperature, 12hrs. light/dark cycle, (55 ± 5%) humidity and 15 - 20 times air change per hour. Fed on standard chow procured from (Animal Feed & Flour production and marketing Co. L.L.C.) and water supplied *ad libitum.*

Reagents

- Plant extract.
- 80% ethanol 1ml/kg p.o.
- 0.2M NaOH.

Materials and disposables

- Balance
- Dissecting lamp (magnifier)
- Dissection plate
- Corkboard
- Pins
- Syringe 3 ml with feeding needle
- Scissor
- Forceps
- Marker pen.

Protocol

The test substance used is the *Moringa peregrina* extract provided by the Phytochemistry for anti-gastric ulcer activity screening is suspended/ dissolved in water before the administration to the animals. The water is given to the control in the same volume and administered by the same route.

The necrotizing agents (80% v/v ethanol and 0.2M NaOH) used as ulcer inducer were freshly prepared before administration.

Procedure

The animals (32 Wistar albino rats) 250 - 300g body weight were arranged into 4 groups 8 animals per group 4 males and 4 females. Two groups, one used as control group and the other as *Moringa peregrina* treated group with the ulcer inducer 80% ethanol model. The other two, one group used as control and the other used as *M. peregrina* treated with the ulcer inducer 0.2M NaOH model. The animals fasted for 40 hours with free access to the water. They were kept four per cage with mesh wire bottoms to prevent coprophagy.

The plant extract or vehicle was administered intra-gastric 1g/kg p.o. to the treated groups by syringe with feeding needle. The controls received only water. 1h. later the 80% ethanol control and treated group administered with the ulcer inducer 1ml of 80% ethanol per animal.

And the same process repeated with NaOH control and treated groups. One hour after the ulcer inducer administration, the animals were sacrificed by an overdose of anesthetic ether, stomachs removed and opened along the greater curvature, rinsed with saline and pinned flat on a corkboard. They were examined with the aid of a binocular microscope (xl0) for the ulcer lesions, and the degree of ulceration was graded according to the following severity scale 0 = no visible ulcer; 1 = petechial hemorrhage or pinpoint ulcers; 2 = one or two small ulcers; 3 = many ulcers mainly small; 4 = many ulcers mainly large. Mean/ulcer scores for each animal were calculated and expressed as the ulcer index.

Data values were expressed as Mean ± SEM. Where appropriate the data was analyzed with Student's t-test.

Groups	Ulcer index X ± Se
Control (1 ml water)	3.9 ± 0.34
M. peregrina 1 g/kg	0.57 ± 0.3***

Table 1: *Effect of an aqueous extract of M. peregrina on gastric ulcer in rat model induced by 80% ethanol.*

Groups	Ulcer index X ± Se
Control (1 ml water)	3.7 ± 0.45
M. peregrina 1 g/kg	1.8 ± 0.5**

Table 2: *Effect of an aqueous extract of M. peregrina on gastric ulcer in rat model induced by 0.2M NaOH.*

*Mean ± SEM (n = 8). Statistically significant at values of *P < 0.05; ***P < 0.001 compared with control.*

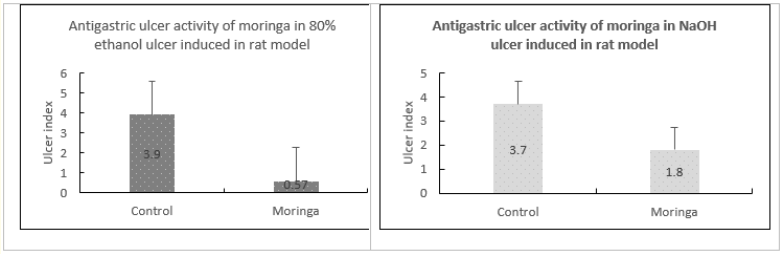

Figure 1

Results, Discussion and Conclusion

The data showed that the aqueous extract of *M. peregrina* reduced the formation of gastric ulcers induced by ulcerogenic drugs indicating anti-gastric ulcer activity. The study demonstrates that the extract has pronounced gastro-protective effects against the gastric ulcer models studied.

Effect on cardiovascular system (Effect on blood pressure and heart rate in anaesthetized rats)

Carotid arterial blood pressure in anaesthetized rats: The cardiovascular effect of the aqueous extract of *Moringa peregrina* was investigated in anaesthetized normotensive rats. Aqueous extract of *Moringa* in a concentration 100mg/ml was centrifuged at 1000 r.p.m. The clear supernatant liquid at the dose of 100mg/100g, body weight was administered i.v. in the femoral vein.

The extract showed a significant sharp reduction arterial blood pressure. The heart rate at the same doses was also found stable. However, it was noticed that the heart rate was increased after an hour of drug treatment.

Groups	Ulcer index X ± Se
Control (1 ml water)	3.7 ± 0.45
M. peregrina 1 g/kg	1.8 ± 0.5**

Table 2: *Effect of an aqueous extract of M. peregrina on gastric ulcer in rat model induced by 0.2M NaOH.*

*Mean ± SEM (n = 8). Statistically significant at values of *P < 0.05; ***P < 0.001 compared with control.*

Administration of the extract (1 ml/100g, body weight administered intraperitoneally (100 mg/ml, body weight), also showed the hypotensive activity of the plant. Comparing the two routes the animals were administered i.v. showed a more pronounced effect as compared to the animals administered intraperitoneally.

Bibliography

1. Marwah RG., *et al*. "Antioxidant capacity of some edible and wound healing plants in Oman". *Food Chemistry* 101.2 (2007): 465-470.
2. Soltan MM and Zaki AK. "Antiviral screening of forty-two Egyptian medicinal plants". *Journal of Ethnopharmacology* 126.1 (2009): 102-107.
3. Koheil MA., *et al*. "Anti-inflammatory and antioxidant activities of *Moringa peregrina* seeds". *Free Radicals and Antioxidants* 1.2 (2011): 49-61.
4. Dehshahri S., *et al*. "Antioxidant activity of methanolic leaf extract of *Moringa peregrina* (Forssk.) Fiori". *Research in Pharmaceutical Sciences* 7.2 (2012): 111-118.
5. Lalas S., *et al*. "Determination of antimicrobial activity and resistance to oxidation of *Moringa peregrina* seed oil". *Molecules* 17.3 (2012): 2330-2334.
6. Al-Owaisi M., *et al*. "GC-MS analysis, determination of total phenolics, flavonoid content and free radical scavenging activities of various crude extracts of *Moringa peregrina* (Forssk.) Fiori leaves". *Asian Pacific Journal of Tropical Biomedicine* 4.12 (2014): 964-970.
7. Majali IS., *et al*. "Assessment of the antibacterial effects of *Moringa peregrina* extracts". *African Journal of Microbiology Research* 9.51 (2015): 2410-2414.
8. Moustafa SMA., *et al*. "Screening of some wild and cultivated Egyptian plants for their free radical scavenging activity". *International Journal of PharmTech Research* 6 (2014): 1271-1278.
9. Safaeian L., *et al*. "The effect of hydroalcoholic extract from the leaves of *Moringa peregrina* (Forssk.) Fiori. on blood pressure and oxidative status in dexamethasone-induced hypertensive rats". *Advanced Biomedical Research* 4 (2015): 101.
10. Ullah MF., *et al*. "Antidiabetic potential of hydro-alcoholic extract of *Moringa peregrina* leaves: implication as functional food for prophylactic intervention in prediabetic stage". *Journal of Food Biochemistry* 39 (2015): 360-367.
11. Alrayes LMH., *et al*. "Clonal propagation and antibacterial activity of *Moringa peregrina* (Forssk) fiori plant". *Journal of Advances in Biotechnology* 6.1 (2016): 787-797.
12. El-Awady MA., *et al*. "Comparison of the antioxidant activities, phenolic and flavonoids contents of the leaves-crud extracts of *Moringa peregrine* and *Moringa oleifera*". *International Journal of Biosciences* 8.1 (2016): 55-62.
13. Azim SAA., *et al*. "Protective effect of *Moringa peregrina* leaves extract on acetaminophen-induced liver toxicity in albino rats". *African Journal of Traditional, Complementary and Alternative Medicines* 14.2 (2017): 206-216.
14. Elabd EMY., *et al*. "A comparative study of the effects of three *Moringa* species on obesity-induced oxidative stress state in liver tissue". *International Journal of Pharma and Bio Sciences* 8.2 (2017): 572-584.
15. Saleh NM., *et al*. "Challenge of *Moringa peregrina* Forssk as an antimicrobial agent against multidrug-resistant *Salmonella* sp". *Medical Biotechnology* 31.2 (2017): 380-386.

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