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Research Article

Preliminary Phytochemical Profile of *Moringa oleifera* Seed Extracts

G. Prem Kumar[1]*, Prabhavathi Prem Kumar[2], Basant Jain[3] and Urvashi Jain[4]
[1, 2]Crescent Biologicals Pvt. Ltd., Gandhipet, Tirupattur, Tamil Nadu, India; [3,4]BU Agro Tech Pvt., Ltd., India
drpremkumar@crescentbiologicals.com*; +91 93440 37811
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Abstract

Preliminary phytochemical profile of *Moringa oleifera* seed extracts were evaluated in the present study. The seed powder (with and without husk) of *M. oleifera* was extracted with aqueous methanol solvent. Qualitative phytochemical screening of *M. oleifera* seed extract was assessed by standard methods. All the phytochemical constituents tested were present in aqueous methanolic extract of *M. oleifera* seed except tannins, phenols, coumarins, anthocyanin and betacyanin. There was no change in the presence of phytochemicals both with and without husk of aqueous methanolic seed extract of *M. oleifera.*

Keywords: Phytochemicals, *Moringa oleifera*, seed extracts, saponins, phenols, anthocyanin.

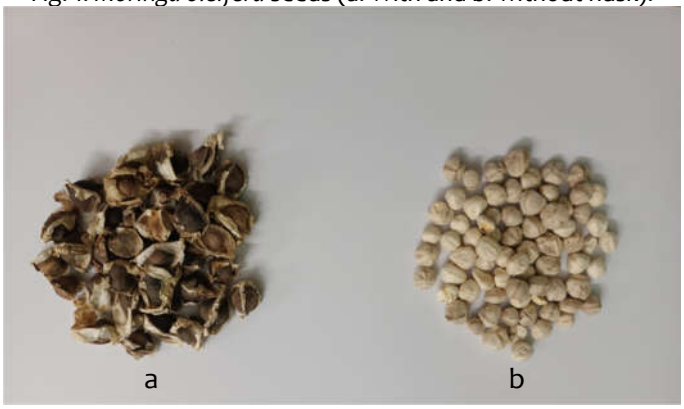
Introduction

Moringa oleifera is a plant that is often called the drumstick tree, the miracle tree, the ben oil tree, or the horseradish tree. Moringa has been used for centuries due to its medicinal properties and health benefits. It also has antifungal, antiviral, antidepressant, and anti-inflammatory properties. The plant belongs to a single-generic family called *Moringaceae*. The genus *Moringa* has 14 species, which comprises of shrubs and trees. The actual botanical name of the species is *Moringa oleifera* Lam. The plant seeds are among the most useful nutritious botanical product with high economic values. It is also recognized as medicinal and herbal remedies. The seeds have antimicrobial properties and have buffering capacity, thus it has also been used in industrial and agricultural field (Leone *et al.,* 2015; Rani *et al.,* 2018). The leaves of M. *oleifera* are rich source of both macro- and micronutrients, such as protein and many vitamins (Siddhuraju and Becker, 2003). Fresh leaf juice inhibits the growth of human pathogens (Das *et al.,* 1957). The seeds also show antimicrobial activity (Oliveira *et al.,* 1999). Fruits or pods have wide spectrum of antimicrobial and antifungal activities against common pathogens (Sayeed *et al.,* 2012). The roots have been reported to have antispasmodic and antimicrobial activity and used for diarrhea treatment (Caceres *et al.,* 1992). Considering the above facts in view, this study was aimed to analyze the preliminary phytochemical profile of *Moringa oleifera* seed extract.

Materials and methods

Preparation of aqueous and solvent seed extracts: The dried *Moringa oleifera* seeds (With and without husk) were coarsely powdered using a mixer grinder (Fig. 1). The seeds were extracted with 200 mL of solvent mixture containing 20 mL distilled water and 180 mL methanol. The sample was extracted at 37°C for 24 hours. The mixture was filtered and the solvent was evaporated under reduced pressure. The extract was transferred into a conical flask and stored at 4°C.

Fig. 1. *Moringa oleifera* seeds (a. With and b. without husk).



Phytochemical screening: Phytochemical screening of *Moringa oleifera* extracts were assessed by standard method as described by Savithramma *et al.* (2011) and Selvaraj *et al.* (2014).

*Corresponding author

Table 1. Phytochemical screening of *Moringa oleifera* seed extracts.

Phytochemicals tested	With husk	Without husk
Tannins	-	-
Saponins	+	+
Quinones	+	+
Flavonoids	+	+
Alkaloids	+	+
Glycosides	+	+
Cardiac glycosides	+	+
Terpenoids	+	+
Phenols	-	-
Steroids	+	+
Coumarins	-	-
Anthocyanin & Betacyanin	-	-

'+' = Present; '-' = Absent

Test for Tannins: One mL of the seed extract was added to 1 mL 5% ferric chloride. Formation of dark blue or greenish black indicates the presence of tannins.

Test for Saponins: One mL of the seed extract was added to 1 mL distilled water and shaken in graduated cylinder for 15 min; lengthwise formation of 1 cm layer of foam indicates the presence of saponins.

Test for Quinones: One mL of the seed extract was added to 1 mL conc. sulphuric acid. Formation of red color indicates the presence of quinones.

Test for Flavonoids: One mL of the seed extract was added to 1 mL 2N sodium hydroxide. Formation of yellow color indicates the presence of flavonoids.

Test for Alkaloids: One mL of the seed extract was added to 2 mL conc. HCl. Then, few drops of Mayer's reagent were added**.** Presence of green color or white precipitate indicates the presence of alkaloids.

Test for Glycosides: One mL of the seed extract was added to 3 mL chloroform and 10% ammonium solution. Formation of pink color indicates the presence of glycosides.

Test for Cardiac Glycosides: One mL of the seed extract was added to 2 mL glacial acetic acid and few drops of 5% $FeCl_3$. This was under layered with 1 mL of concentrated sulphuric acid. Formation of brown ring at interface indicates the presence of cardiac glycosides.

Test for Terpenoids: One mL of the seed extract was added to 2 mL chloroform along with conc. sulphuric acid. Formation of red brown color at the interface indicates the presence of terpenoids.

Test for Phenols: One mL of the seed extract was added to 2 mL distilled water followed by few drops of 10% ferric chloride. Formation of blue/green color indicates the presence of phenols.

Test for Steroids: One mL of the seed extract was added to 2 mL chloroform and 1 mL sulphuric acid. Formation of reddish brown ring at interface indicates the presence of steroids.

Test for Coumarins: One mL of the seed extract was added to 1 mL 10% NaOH. Formation of yellow color indicates the presence of coumarins.

Test for Anthocyanin and Betacyanin: One mL of the seed extract was added to 1 mL 2N sodium hydroxide and heated for 5 min at 100°C. Formation of bluish green color indicates the presence of anthocyanin and formation of yellow color indicates the presence of betacyanin.

Results and discussion

Moringa oleifera is one of the most widely cultivated species of monogenic family in recent times (Anwar *et al.,* 2007). It is a drought-tolerant plant that thrives best under the tropical climate and tolerates different soil types (Fahey, 2005). *Moringa oleifera* is highly valued since almost every part of the plant i.e. the leaves, seeds, roots, bark, fruit and flower is directly or indirectly used as food with high nutritional value (Chuang *et al.,* 2007). All the phytochemical constituents tested were present in aqueous methanolic extract of *M. oleifera* seed except tannins, phenols, coumarins, anthocyanin and betacyanin (Table 1). There was no change in the presence of phytochemicals both with and without husk of aqueous methanolic seed extract of *M. oleifera.*

***Corresponding author**

Conclusion

The present study showed interesting preliminary phytochemical constituents in seed extracts of *Moringa oleifera*. Further characterization and quantitative assay may be carried out to test the peel extracts for various therapeutic and pharmacological activity.

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***Corresponding author**