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RESEARCH AND REVIEWS: JOURNAL OF PHARMACEUTICS AND NANOTECHNOLOGY

A Review of *Moringa Oleofera* Lam Seed Oil Prospects in Personal Care Formulations.

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Review Article

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ABSTRACT

Moringa seed oil found application in skin preparations and ointments since the time of ancient Egypt. The clear yellow oil has a pleasant taste, and has been compared, in terms of quality with other seed oils. The oil of excellent quality similar to the olive oil, the Moringa seed oil finds wide application in cosmetic industry. The review focused mainly on the quality assessment of Moringa oleofera seed oil extracted through solvent and aqueous-enzymatic techniques based on previous research reports and utilization of the seed oil in personal care formulations.

INTRODUCTION

Moringa oleifera Lam {Syn M.pterygosperma Gaertn} usually mentioned in the literature as *Moringa*, is a natural as well as cultivated variety of the genus *Moringa* belonging to family *Moringaceae* [1] *Moringa oleifera* Lam. (*MO*) is a small size tree with approximately 5 to 10 m height. It is cultivated all over the world due to its multiple utilities [2]. *Moringa oleifera* Lam (Moringaceae) is a highly valued plant, distributed in many countries of the tropics and subtropics [3].

The Moringa tree, *Moringa oleifera* is native to India but has been planted around the world and is naturalized in many locales. Moringa goes by many names. In the Philippines, where the leaves of the moringa are cooked and fed to babies, it is called “mother’s best friend” and “malunggay.” Other names for it include the benzolive tree (Haiti), horseradish tree (Florida), Nebedey (Senegal) and drumstick tree (India) [4]. In northern Nigeria it is known in Hausa language as “Zogale” [5]. There are about 13 species of moringa trees in the family Moringaceae. They are native to India, the Red Sea and/or parts of Africa including Madagascar. Of these species, *Moringa oleifera* is the most widely known. It is a multipurpose tree known as nature’s medicine cabinet [6]. Almost all parts of the plant are potentially useful. The seeds are probably the most useful part of the plant, containing a significant percentage of high quality oil [7]. The seeds of moringa contain about 35- 40% oil.

This oil is of excellent quality similar to the olive oil, and is slow to become rancid [4]. It gave high oil yield, which has good antioxidant capacity with potential for industrial , nutritional and health applications [8]. The oil that is extracted from them, which is sometimes known as ‘ben oil’, is used for a variety of purposes [9, 10]. It is used as fuel for cooking purpose and burnt for light in developing countries [11] .It is also used in perfumes, as lubricant in watches and other farm machinery and for making soap [9, 10, 4, 12] The Romans, Greeks and Egyptians extracted edible oil from the seeds and used it for perfume and skin

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lotion. In the 19th century, plantations of moringa in the West Indies exported the oil to Europe for perfumes and lubricants for machinery [13].

Among the several fatty acids in *Moringa oleifera*, the most abundant of the unsaturated fatty acids is oleic acid which was recommended for use in pharmaceutical preparation preferably in skin treatment. Various extraction methods are employed in obtaining oil from moringa seeds. Quality assessment of *Moringa concanensis* seed oil extracted through solvent and aqueous-enzymatic techniques was reported [14]. Moringa oil is non-drying with a pale yellow consistency. It has various cosmetic values and is used in body and hair care as a moisturizer and skin conditioner. Moringa oil is useful in removing dirt out of the hair and is an efficient natural cleanser. Moringa oil blends easily with essential oils and this combined with its non-drying quality and its ease of application on the skin makes it excellent massage oil. Other uses include soap making and for use in cosmetic preparations such as lip balm and creams. The oil can be considered having relative potential for cosmetics just like the African shea nut butter [15] More recently, the ben oil has also been shown to be particularly effective in the manufacture of soap producing a stable lather with high washing efficiency suitable for some African countries [3].

Figure 1a: *Moringa oleifera* Lam plant

Figure 1b: *Moringa oleifera* seed

Oil extraction

The plant, its seeds (Figure 1a and b) and extraction methods are employed in obtaining the oil from moringa seeds as shown in figures below. Traditional or local methods of extracting oil from seeds

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can be used, even though these are slow and inefficient compared to the use of modern machines. The traditional methods involve extracting the oil from the seeds by grinding them and cooking them in water for few minutes. After cooking, the seeds are pressed in a cloth and the liquid placed in a clean container. This is then left for one day to allow the oil to separate from the water. It may be necessary to filter off small pieces of seeds floating on the surface of the oil. For research purpose the laboratory extraction using suitable solvents is employed.

Figure 1c: Hexane extract of moringa seed oil

Cosmetic application of *Moringa oleifera* seed oil

Moringa oleifera is the best known of the 13 species of the genus *Moringaceae*. It was highly valued in the ancient world. The Romans, Greeks and Egyptians extracted edible oil from the seeds and used it for perfume and skin lotion. In the 19th century, plantations of Moringa in the West Indies exported the oil to Europe for perfumes. The oil from *Moringa oleifera* (INCI: *Moringa oleifera* Seed Oil) was used by the ancient Egyptians as a potent cure for skin disorders. Moringa Oil is rich in essential fatty acids, making it an ideal moisturizer and healing and soothing emollient for rough, dry skin and therapeutic massages. Perfume manufacturers esteem the oil for its great power of absorbing and retaining even the most fugitive odors and for it stability.

The fatty acid composition is considered to be similar to that for olive. The oil is light and spreads easily on the skin making it good for massage or as carrier oil for aromatherapy. Moringa oil is utilizable in creams, lotions, balms, scrubs, body oils, and hair care formulations. Moringa oil brings occlusive, “cushiony” emolliency to hair and skin formulas. The presence of behenyl acid (see section 4.2.) provides a much-sought rich emolliency without a greasy after-feel [16]. Determination of antioxidant of *Moringa oleifera* seed oil and its use in the production of a body cream was reported [17]. Formulation and in vitro evaluation for sun protection factor of *Moringa oleifera* Lam (family-moringaceae) oil sunscreen cream was reported [18] Production of Soap from an Indigenous *Moringa oliefera* Lam Seed Oil was also reported [19]. (Warra, 2012)

Chemistry of Behenic Acid

Behenic acid [Figure 2] is a carboxylic acid the saturated fatty acid with formula $C_{21}H_{43}COOH$. In appearance, it consists of white to cream color crystals or powder with a melting point of 80 °C and boiling point of 306 °C. It is soluble in both ethanol and ether. It is a major component of Ben oil which is extracted from the seeds of the *Moringa oleifera* tree.

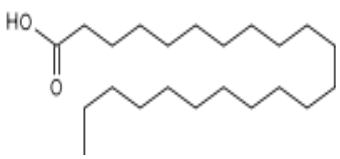

Figure 2: Structure of Behenic acid

Other names for Behenic acid are Docosanoic acid; 1-Docosanoic acid; *n*-Docosanoic acid, *n*-Docosanoate, Glycon B-70, Hydrofol Acid 560, Hydrofol 2022-55, Hystrene 5522, Hystrene 9022, Prifrac 2989, C22:0 (Lipid number).

Industrially, Behenic acid is manufactured by hydrolysis of high erucic acid rapeseed oil at a high temperature (at 'least 200oC) under steam pressure, and subsequent hydrogenation of erucic acid to behenic acid in the presence of a nickel catalyt.

Behenic acid is often used to give hair conditioners and moisturizers their smoothing properties. Also used as anti-foam in the manufacturing of detergents.

CONCLUSION

The tremendous cosmetic value of *Moringa oliefera* seed oil from the review of previous literature included but not limited to body and hair care and as a moisturizer and skin conditioner.

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