

Introduction

Abstract

Small, controlled, clinical studies were carried out to explore the functionality of Moringa Butter [INCI: Moringa Oil/Hydrogenated Moringa Oil Esters]. All studies were performed double-blind and carried out in a well-controlled environment (temperature 20-22° Celsius, relative humidity <50%). The first study evaluated the ability of Moringa Butter, in a stick formulation, to increase skin hydration. After one application, the stick formulation that contained Moringa Butter produced greater skin hydration than those that contained any of the other marketed butters. In the second study, the same stick formulation containing Moringa Butter was compared to a marketed butter in a consumer preference study, and the formulation containing Moringa Butter was preferred. The third study evaluated the ability of Moringa Butter, within a simple lotion formulation, to increase barrier recovery when applied to the skin following sodium lauryl sulfate (SLS) exposure. After two applications, 67% barrier recovery was observed (compared to 21% by vehicle). These results show that Moringa Butter, when incorporated into cosmetic formulations, provides multiple benefits to skin, such as skin hydration, enhanced consumer perception, and barrier function.

Ancient History of Moringa Seed Oil¹

Moringa oleifera (see Fig. 1) is a flowering tree native to the foothills of the Himalayas in northern India. It is cultivated in many parts of the world including Africa, tropical Americas, Sri Lanka, Malaysia, and the Philippines.² Not surprisingly, the Moringa tree is known by many names. In Senegal it is known as Nebeday tree (the tree that never dies) because it is able to survive disasters such as fire and it grows quickly (up to 12 meters per year). In the Philippines the Moringa tree is known as a mother's best friend because Moringa leaves are used to increase the amount of a mother's milk, or are boiled and fed to children. In India, the Moringa tree is called the drumstick tree due to the elongated shape of its seed pods.³ The Moringa tree is also known by various other names through out Africa, Asia, South and Central America, and the Caribbean.⁴

The use of Moringa oil, by ancient Egyptians has been recorded in hieroglyphs. In fact, Egyptologists have documented various applications and formulas containing Moringa oil for topical pastes and perfumes.⁵ Some of the historical uses of the Moringa plant include (Table 1)^{3,6,7}:

Table 1: Medicinal uses for the Moringa tree

Plant Part	Medicinal Applications
Roots	Anti-inflammatory, blood circulatory stimulator, and laxative
Bark	Eye and spleen diseases, delirium, tumors, and ulcers
Leaves	Soothing agent for sores, headaches, eye and ear infections, and as a laxative
Rubber	Astringent for healing tooth decay
Flowers	Treat inflammation, muscular pain, and tumors
Seeds	Antibiotic
Pods	Hypertensive effect
Oil	Included in paste for topical oral and skin treatments

Uniqueness

A Truly Remarkable Tree¹

On Earth Day 2008, as is the annual tradition, the US National Institutes of Health hosted a mystery plant contest. The clues for the mystery plant included:

... (it) has important medicinal properties but is not endangered. In fact, perhaps like no other single species, this plant has the potential to help reverse multiple major environmental problems and provide for many unmet human needs.⁷

What was this mystery plant with over 100 different names in multiple languages around the world? *Moringa oleifera* – the Miracle tree whose leaves alone contain seven times the Vitamin C of oranges, four times the Vitamin A of carrots, four times the calcium of milk, more iron than spinach, three times the potassium of bananas, and twice the protein of yogurt.^{3,9} In addition, this vitamin-rich plant contains a variety of amino acids, as well as antioxidants and trace elements.¹⁰

The positive attributes of the Moringa tree don't end with its nutritional benefits. In fact, the seed oil from *Moringa oleifera* has the highest oxidative stability of any vegetable oil available. Moringa oil also imparts several favorable aesthetic properties, such as providing a rich, cushiony, non-greasy skin-feel with low odor and color, to cosmetic and personal care formulations.¹⁰



Figure 1a: *Moringa oleifera* tree



Figure 1b: *Moringa oleifera* seeds

An Uncommon Butter¹

- Properly prepared commercially available Moringa oil has an unexpectedly high OSI of ~133 hours, compared to similarly treated vegetable oils which have typical OSI values of ~30 hours.¹⁰
- Moringa oil is also unique in its low free fatty acid content. Free fatty acids can be irritating to the skin.¹⁰
- The sterol portion in Moringa oil has a high content of beta-sitosterol.^{2,11} Beta-sitosterol is known for its anti-inflammatory effect and its restorative properties which helps to support the skin hydrolipid barrier.^{2,12}
- Moringa Butter is made by interesterifying Moringa oil and fully hydrogenated Moringa oil, thus preserving the natural cis- configuration of each double bond. The result is a butter with no trans fats.

Results

Skin Hydration Benefits¹³

Purpose: to evaluate the skin hydration potential of Moringa Butter compared to other butters, when added to an anhydrous stick formulation

Design: one application of each experimental stick was applied to dry lower legs of twelve healthy subjects

End Point: increased skin hydration as measured by the Corneometer CM 825 over four hours (Figure 2)

Figure 2. Increased Skin Hydration

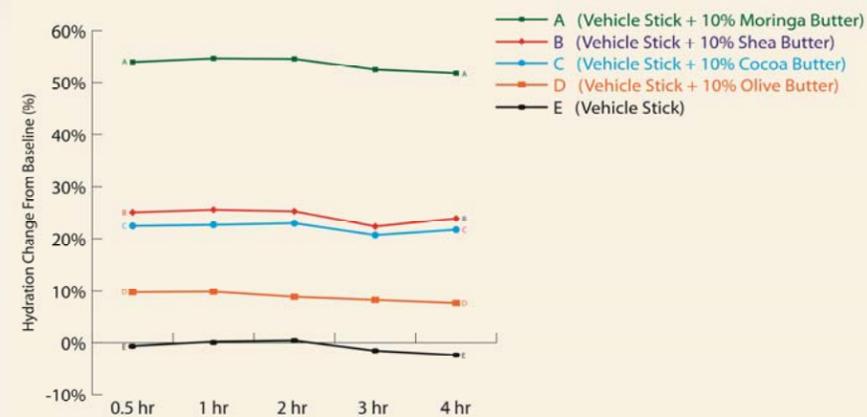


Figure 2: The test articles containing Moringa Butter increased skin hydration better than the vehicle and all other butters at all time points (p<0.05).

Consumer Perception Benefits¹³

Purpose: to ascertain consumer preference between an anhydrous stick formula containing Moringa Butter and an anhydrous stick formula containing shea butter

Design: one application of each experimental stick was applied to the backs of the hands of 25 healthy subjects

End Point: consumer preference survey immediately following application (Figure 3)

Figure 3. Increased Consumer Preference

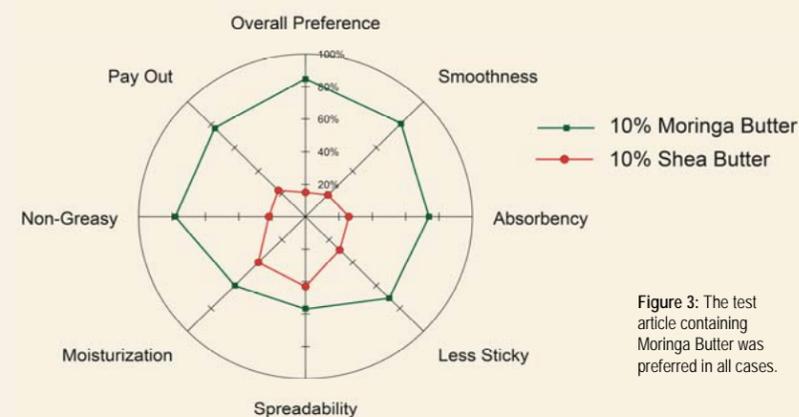


Figure 3: The test article containing Moringa Butter was preferred in all cases.

Results Cont'd

Skin Barrier Recovery¹³

Purpose: to ascertain the benefits of a simple lotion formula containing Moringa Butter [compared to a simple lotion formula containing petrolatum] on skin barrier recovery due to damage by a known skin irritant, sodium lauryl sulfate (SLS)

Design: two applications of each experimental lotion was applied to the volar forearm (following exposure to SLS for approximately 18 hours under occlusion using 19mm Hill Top Chambers)

End Point: increased percent barrier recovery as measured by TEWL via the Tewameter TM300 (Figure 4)

Figure 4. Increased Percent Barrier Recovery

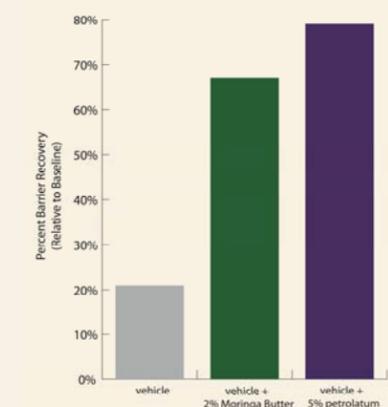


Figure 4: The addition of 2% Moringa Butter produced statistically significant increases (p<0.01) in barrier recovery over the vehicle.

Conclusions

- Moringa Butter increased skin hydration better than shea butter, cocoa butter, and olive butter.
- Moringa Butter was preferred over shea butter in a consumer preference study.
- Moringa Butter increased skin barrier recovery similar to petrolatum.

References

- Oliphant T and Harper R. Moringa Butter: Ancient Botanical in Modern Form. *Personal Care Magazine*. June 2011.
- Moringa Oleifera pages. Department of Engineering, University of Leicester. Web (accessed April 2010). <http://www.le.ac.uk/eng/enginfo/2010/moringa.htm>
- Price KL. The Moringa Tree. *Environ Biol Fish*. 1995; 46:1-10. Web (accessed 13 April 2011). <http://dx.doi.org/10.1007/s10641-000-0000-0>
- Names for Moringa. Trees for Life International. Web (accessed 13 April 2011). <http://www.treesforlife.org/moringa.htm>
- Morichev L. Moringa: An Ancient Egyptian Herbal. *Acad. J. Sci. Res.* 2008; 5(1):1-10.
- Sabharwal V, Paragade A, Ayya C, Sakarkar SN, and Sabharwal PM. Moringa Oleifera (Drumstick): An Overview. *Pharmacology Adv (Supplement)*. 2011; 7:1-13.
- Harper RA, Oliphant T, Price KL, and McCaskey J. Moringa Oleifera: An Emerging Source of Active Ingredients for Skin and Hair Care. *SOFW Journal* 2009; 41:52-2011.
- WHO Celebrates Earth Day 2008. *WHO (National Institutes of Health) Record*. L1003. 3, March 2008. Web (accessed 13 April 2011). http://www.who.int/mediacentre/news/2008/03_21_20080304.html
- Coppen C, Rama BV Sankar, and Baksubramanian SC. Nutritive value of Indian foods. Hyderabad, India: National Institute of Nutrition; 1971 (revised and updated by Narasimha Rao BS, Doodhale YC, and Pant KC, 1989).
- Rigero L, Andriotti C, and Radice A. Moringa Seed Oil - The New Soul of Cosmetics. *SOFW Journal*. 13(7), 48-54, 2011.
- Hansen AK. Curcuma longa (Curcumin) and Moringa oleifera (Moringa) in the treatment of skin. *American Journal of Pharmacology and Toxicology* 7 (2), 48-49, 2007.
- Coppen MB, Nath R, Srinivasulu N, Shankar K, Kishor K, and Bhargava KP. Anti-inflammatory and Antipruritic Activities of Beta-Sitosterol. *Planta Med*. 2003; 157:163-169.
- Research Final Reports 10-022 and 10-023 (clinical data)

iLabel® – Floratech Information Instantly

iLabel delivers valuable product information instantly. It supplies lot-specific information including certificates of analysis, material safety data sheets, product specifications and technical data.

iLabel saves time by providing instant access to global regulatory information, clinical efficacy data, and demonstration formulas featuring Floratech products.

iLabel is an easy-to-use tool that does not require registration, usernames, or passwords.

Please direct inquiries and comments to Floratech:
email: sales@floratech.com
phone: + 1.480.545.7000
fax: + 1.480.892.3000

SAMPLE LABEL

FLORATECH
HMIS: 0,1,0

FLORAESTERS
K-20W® JOJOBA

INCI: HYDROLYZED JOJOBA ESTERS,
WATER (AQUA)

Shipped:
Y: [11] [12] [13] [14] [15] **LOT: SAMP013**
M: [1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12]

291 East El Prado Court | Chandler, Arizona 85225
T 480.545.7000 F 480.892.3000 floratech.com

iLabel
Product info 24/7
floratech.com/info

Moringa Butter: The Better, Functional Butter

Presented by: Tiffany N Oliphant, M.S., C.C.R.C.,
and Robert Harper, Ph.D.

For the Society of Cosmetic Chemists
2011 Technology Showcase

December 8th – 9th, 2011
New York, NY



Contact: sales@floratech.com