# Use of Moringa Oleifera Seeds in Water Treatment

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*Short Editorial related to the article: Evaluation of the Cardiac Effects of a Water-Soluble Lectin (Wsmol) from Moringa Oleifera Seeds*

*Moringa oleifera* Lamarck (MO) is a plant of the *Moringaceae* family, native to the Himalayas and adapted on several continents, is widely cultivated in Asia, Africa and the Americas.[1] Rapidly growing, the whole plant has a wide variety of applications in diet and folk medicine.

However, scientific evidence of its properties began to emerge only in the beginning of 2000. In experimental studies *in vitro* or *ex-vivo*, leaves and seeds showed several biological effects, such as anti-inflammatory and wound healing,[2] antitumor,[3] antidiabetic,[4] antioxidant[4,5] and sexual function.[6,7]

Due to their flotation properties and antimicrobial action, seeds have been used to purify water.[8] It is a low-cost method, which uses natural resources and easy handling that can offer quality in the water of poor communities. The seeds can absorb pollutants such as herbicides,[9] heavy metals,[10] medications[11,12] and act as larvicides and natural antimicrobials.[13]

Among the components present in *Moringa oleifera* seed, water-soluble lectin (WSMoL) has the property of *Aedes aegypti* larvicide and ovicide[14] and anti nematodes.[15]

As all scientific knowledge about *Moringa oleifera* is still based on experimental studies, there is a need to respect the stages of clinical research for use in humans. Thus, in 2019 in Brazil, the National Health Surveillance Agency (ANVISA) prohibited the manufacture, import, marketing, advertising and distribution of all foods containing *Moringa oleifera* (RESOLUTION-RE No. 1,478, OF 3 JUNE 2019)

Likewise, in relation to the use of seeds for water purification, a study to ensure safety is also necessary. In this context, in this edition of the *Arquivos Brasileiros de Cardiologia*, Yurre et al.[16] conducted a careful investigation of the cardiotoxic effects of WSMoL from *Moringa oleifera* seeds. The authors evaluated the possible cellular, structural, electrical and functional effects on the heart, effects on carbohydrate metabolism and body weight. It was a study that sought to test its null hypothesis and was successful in demonstrating, experimentally, the safety of using WSMoL for 21 days and it encourages new projects to evaluate the safety of using *Moringa oleifera* seeds for the purification of water for human use.

## Keywords

Moringa Oleifera; Glycosides; Anti-Inflammatory Agents; Plant Lectins; Water Security.

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## Referências

1. Matic I, Guidi A, Kenzo M, Mattei M, Galgani A. Investigation of medicinal plants traditionally used as dietary supplements: A review on *Moringa oleifera*.J Public Health Afr. 2018 Dec 21;9(3):841.
2. Udupa SL, Udupa AL, Kulkarni DR. Studies on anti-inflammatory and wound healing properties of Moringa oleifera and Aegle marmelos. Fitoterapia. 1994;65:119-23.
3. Sadek KM, Abouzed TK, Abouelkhair R, Nasr S. The chemo-prophylactic efficacy of an ethanol Moringa oleifera leaf extract against hepatocellular carcinoma in rats. Pharmaceutical Biology. 2017;55(1):1458-66.
4. Gupta R, Mathur M, Bajaj VK, Katariya P, Yadav S, Kamal R,et al. Evaluation of antidiabetic and antioxidant activity of Moringa oleifera in experimental diabetes. J Diabetes. 2012;4(2):164-71.
5. Shaat AR, Sadek KM, El-Far AH, Nasr SM, El-Sayed Y. Evaluation of antioxidant and hepatoprotective activities of moringa (moringa oleifera) leaves in diabetic rabbits. Eur J Pharmac Med Res. 2017;4(7):154-62.
6. Sadek KM. Chemotherapeutic efficacy of an ethanolic Moringa oleifera leaf extract against chromium-induced testicular toxicity in rats. Andrologia. 2014;46:1047-54.
7. Prabsattroo T, Wattanathorn J, Iamsaard S, Sompsat P, Sritragool O, Thukhummee W,et al. Moringa oleifera extract enhances sexual performance in stressed rats. J Zhejiang Univ Sci. 2015;16(3):179-90.
8. Nouhi S, Kwaambwa HM, Gutfreund P, Rennie AR. Comparative study of flocculation and adsorption behaviour of water treatment proteins from Moringa peregrina and Moringa oleifera seeds. Sci Rep. 2019;9(1):17945.
9. Cusioli LF, Bezerra CO, Quesada HB, Alves Baptista AT, Nishi L, Vieira MF, et al. Modified *Moringa oleifera* Lam. Seed husks as low-cost biosorbent for atrazine removal. Environ Technol. 2019 Aug 14:1-12.
10. Freitas JH, de Santana KV, da Silva PM, de Moura MC, Coelho LC, do Nascimento AE, et al. Evaluation of Moringa oleifera Seed Lectin as a Metal Remover in Aqueous Solutions. Protein Pept Lett. 2016;23(7):645-9.
11. Bagheri A, Abu-Danso E, Iqbal J, Bhatnagar A. Modified biochar from Moringa seed powder for the removal of diclofenac from aqueous solution.Environ Sci Pollut Res Int. 2020;27(7):7318-27.
12. Santos AF, Matos M, Sousa Â, Costa C, Nogueira R, Teixeira JA, et al. Removal of tetracycline from contaminated water by Moringa oleifera seed preparations. Environ Technol. 2016;37(6):744-51.
13. Moura MC, Trentin DS, Napoleão TH, Primon-Barros M, Xavier AS, Carneiro NP, et al. Multi-effect of the water-soluble Moringa oleifera lectin against Serratia marcescens and Bacillus sp.: antibacterial, antibiofilm and anti-adhesive properties.J Appl Microbiol. 2017;123(4):861-74.
14. Silva LLS, Fernandes KM, Miranda FR, Silva SCC, Coelho LCBB, Navarro DMD, et al. Exposure of mosquito (Aedes aegypti) larvae to the water extract and lectin-rich fraction of Moringa oleifera seeds impairs their development and future fecundity. Ecotoxicol Environ Saf. 2019 Nov 15;183:109583.
15. de Medeiros MLS, de Moura MC, Napoleão TH, Paiva PMG, Coelho LCBB, Bezerra ACDS, et al. Nematicidal activity of a water soluble lectin from seeds of Moringa oleifera. Int J Biol Macromol. 2018;108:782-9.
16. Yurre AR, Silva JD, Torres MK, Martins EL, Ramos IP, Lima da Silva WS, et al. Avaliação dos Efeitos Cardíacos de Lectina Solúvel em Água (WSMoL) de Sementes de Moringa Oleifera . Arq Bras Cardiol. 2020; 114(6):1029-1037.