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EFFECTS OF MORINGA (*Moringa oleifera* L.) PLANT ON BIOACTIVE PROPERTIES AND HUMAN HEALTH

R. Babacan¹, V. Lemiasheuski², M. Musa Özcan¹

¹Department of Food Engineering, Faculty of Agriculture, Selcuk University, 42031 Konya, Turkey

²Department of Environmental Chemistry and Biochemistry, Faculty of Environmental Medicine, International Sakharov Environmental Institute of Belarusian State University, 220070 Minsk, Belarus
mozcan@selcuk.edu.tr

The problems of hunger and malnutrition have caused an increase in food demand and search in developing countries in the last few decades. Various plants were used in this sense. Moringa (*Moringa oleifera* Lam. Moringaceae) is a highly valuable plant that is mostly grown in tropical and subtropical regions. It is used for food, pharmaceutical and industrial purposes. Different parts of the MO tree have been identified as unique sources of unparalleled glucosinolates, flavonoids and phenolic acids, carotenoids, tocopherols, polyunsaturated fatty acids (PUFAs), highly bioavailable minerals and folate. *Moringa oleifera* is a versatile herb with exceptional medicinal and therapeutic values used to alleviate and manage a variety of disease states. The leaves of this plant can be used as food and oil can be extracted from the seeds as vegetable oil or biodiesel raw material. The strong antimicrobial and flocculant properties of proteins extracted from *M. oleifera* seeds are important in water treatment. In this review, the phytochemical composition of *Moringa oleifera*, its nutritional values, its effects on human health and its industrial uses are discussed.

Keywords: Moringa, *Moringa oleifera*, Antioxidant, biodiesel, extraction.

Since almost every part of the Moringa tree can be used for food, pharmaceutical and industrial purposes, it is considered one of the most useful trees in the world. This tree has the potential to improve nutrition, increase food security and improve rural development. It contains *M. oleifera*, vitamins A, C, E, carotenoids, alpha-carotene and specific plant pigments with strong antioxidative properties such as beta-carotene, kaempferol, quercetin, rutin. The dried moringa leaf powder was recorded to contain 44.4 % carbohydrate, 28.7 % crude protein, 10.9 % ash, 7.1 % fat, 103.1 mg/100 g iron and 3.0 mg/100 g calcium. Similarly, the protein profile

showed 70.1 % insoluble proteins, 3.5 % glutelin, 3.1 % albumin, 2.2% prolamine and 0.3 % globulin. Seed oil is highly oleic (18: 1, 70-80 %), palmitoleic (16: 1, 6-10 %), stearic (18: 0, 4-10 %) and arachidonic acid (20: 0, 2-4 %) and contains lower oleic, linoleic and linolenic acid. Potassium (K), calcium (Ca) and magnesium (Mg) are the dominant minerals in *Moringa oleifera* tissues. The highest content of K is found in vegetable parts and immature seeds, while leaves and seeds are a rich source of Ca and Mg, respectively. In addition, Moringa's seeds and leaves contain high amounts of Ca, Mg, K, Mn, P, Zn, Na, Cu and Fe. Different parts of the Moringa oleifera tree containing roots, bark, leaves, flowers, fruits and seeds have traditionally been used in a variety of therapeutic applications, including abdominal tumors, hysteria (a psychological disorder), scurvy, stroke, helminthic bladder, prostate problems, wounds and other skin infections. Used. Stohs and Hartman described the physiological and pharmacological activities of the leaves, seeds, bark, roots, juices and flowers of *M. oleifera*. *M. oleifera* seeds have been found to be a good antioxidant that can reduce aging and cancer-related oxidative damage. Many of the bioactive compounds isolated from *M. oleifera* seeds have been found to be potential antitumor regulators. All parts of the Moringa tree are edible and have been consumed by humans for a long time. Moringa seed oil, also known as 'Ben oil' (30-40 % yield by weight), is a sweet, non-stick, non-drying oil resistant to rancidity. It has been used in salads, precision machine lubrication and in the manufacture of perfumes and hair care products. Moringa is one of the most important natural ingredients that can be used in purification of drinking water and low cost is also low risk for human health and the environment. Aruna and Srilatha reported the antibacterial effect of Moringa seed powder on water treatment and treatment of fish ponds. Egbuikwem and Sangodoyin observed that 90 % turbidity was removed by Moringa seed extract in well, river, water samples and they examined their effectiveness against *Escherichia coli* in river water. Moringa seeds are a potential alternative to some traditional synthetic chemical coagulants, such as alum, which can increase the risk of cancer, although not effective for removing turbidity, such as alum, and are considered to be natural, biodegradable, environmentally friendly and safer.

Conclusion. As can be understood from this information, *Moringa oleifera* plant has many positive effects on nutrition and health. In addition, it has various industrial uses. *Moringa oleifera* is a food that people can easily consume thanks to its fatty acids, proteins, minerals, vitamins and flavonoids. Moringa has medicinal and therapeutic effects on disease states thanks to its components. Different parts of the *Moringa oleifera* tree, including roots, bark, leaves, flowers, fruits and seeds, can be used for medicinal purposes. The rich antioxidant content and polyphenols of *Moringa oleifera* leaves are part of a healthy and balanced diet. *Moringa oleifera* has water treatment, biodiesel production and many more industrial uses. Moringa is one of the most cost-effective, low risk and natural ingredients in purifying drinking water.

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