

## CHAPTER I

### INTRODUCTION



*Moringa pterygosperma* (Thai name: Marum) is a small or medium-sized tree 3-10 m in height, with stem 10-30 cm in diameter. The plant belongs to the family Moringaceae, which consists of only the genus *Moringa*. Another well known name; of the tree is *Moringa oleifera* Lamk. It is a vegetable species and widely distributed in India, Egypt, Philippines, Thailand, Malaysia, Burma, Pakistan, Singapore, West Indies, Cuba, Jamaica and Nigeria.

It is called variously as Drumstick, horse radish tree, radish tree, and West Indian : ben. In Burmese it is called dandalonbin; While in Sanskrit it is Sobhanjana and in Bengalese it is Sajnai.

The tree has corky bark, soft, fissured, glabrous, tuberous roots. It is mostly deciduous with soft wood. Its leaves are spirally arranged, 25-45 cm long, crowded at the end of the branches with long-petioled, incompletely tripinnate in the rachises. The leaflets are 12-18 mm long, with glands between the pinnae and the leaflets. They are stalked with ovate or obovate shape, bases are acute, with obtuse or rounded, often oblique. The apex obtuse, rounded or emarginate, entire with dull green colour on both sides (lighter coloured beneath). These leaves are pinnately nerved, at first shortly grey, pubescent and soon turn glabrous. Their sizes are 0.9-1.8 x 0.5-1.2 cm.

Ramachandran, *et al.* (1980) has written:

Flowers are fragrant, bisexual, oblique, stalked, united into erect, axillary, many-flowered panicles, densely pubescent, jointed beneath the apex, 0.7-1 cm long. Calyx deeply 5-partite, tube somewhat angular, cupular-cyathiform, oblique, green densely shortly pubescent on both sides, sepals unequal in size, 0.7-1.4 x 0.25-0.5 cm. Petals 5, unequal yellowish white with a greenish base with thin veins, the 2 hindmost and the two lateral ones reflexed, ovate or obovate, obtuse, with a canaliculate base, on the innerside hairy at the base, otherwise glabrous, 1-1.7 x 0.5-0.6 cm; the foremost petal erect, obovate, obtuse, glabrous on the inside, on the outside with longitudinal rows of hairs, 1.4-1.6 x 0.6-0.8 cm. Stamens 5, alternating with 5 staminate staminodes, densely pilose at the base, the hindmost stamen the longest, 0.8-0.9 cm, the other ones much shorter. Ovary stalked, densely clothed with rather long appressed hairs, terete, with 3 longitudinal furrows, 1-celled; placentae 3, bearing a double row of ovules; style thin, curved white, shortly pubescent, hollowed at the apex.

Capsules are pendulous, linear, acuminate, obtusely trigonous, ribbed; usually 18-45 cm long, sometimes up to 120 cm long, 3-valved, valves spongy and thick; impressions of the seeds, half globose.

Seeds are numerous, globular, about 1 cm diameter, 3-winged (or exalate) : wings produced at the base and the apex, 2-2.5 cm long, 0.4-0.7 cm wide, scarios; the outer walls of the epidermis of testa thick. (Ramachandran et al., 1980; Steenis, 1954)

The leaves, flowers and pod are eaten as vegetables. Sometimes the leaves and twigs are used as fodder. The edible oil from the seeds is known in the trade as Ben oil. It is used for illumination and in cosmetics. The oil is highly esteemed by perfumers, for its great power of absorbing and retaining even the most fleeting odours. (Ramachandran et al., 1980; Ghosh, 1935)

Its medicinal value has long been recognized in the indigenous system of medicine. The medicinal virtues of *Moringa pterygosperma* appear to have impressed many early European physicians who visited India. (Chopra *et al.*, 1932). Almost all parts of the plant have been used for various ailments in indigenous medicine (Ghosh, *et al.*, 1935). The root made into a poultice or paste is very commonly applied to the skin as a counter-irritant and in painful rheumatic joints (Chopra, *et al.*, 1932).

The gum is frequently applied externally for the relief of rheumatic joints and to disperse glandular swellings. The young leaves have been used along with other ingredients in the treatment of scurvy and catarrhal affections of the mucous membrane (Chopra, *et al.*, 1932).

The flowers as hot and dry are considered to possess stimulant and use them as tonics, diuretics and cholagogues. The juice has been prescribed with milk as a diuretic, digestive and antispasmodic. The seeds are described as acrid and pungent, and are used in the treatment of ascites (Chopra, *et al.*, 1932).

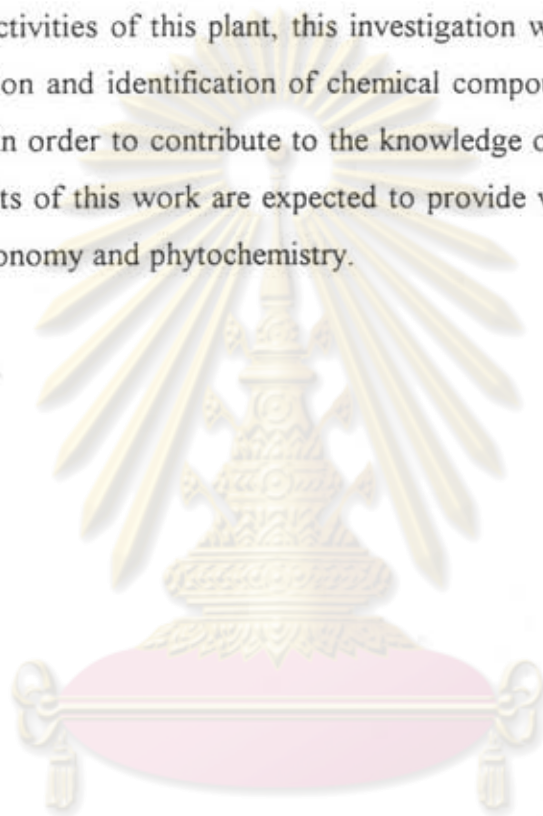
The oil expressed from the seed is used externally for relieving pain of joints and in gout and acute rheumatism. (Villasenor *et al.*, 1989)

Recent pharmacological studies on several parts of the plant showed that they possess antimicrobial activity (Caceres, *et al.*, 1991;), while the seeds reportedly have antispasmodic, anti-inflammatory, and diuretic properties (Caceres *et al.*, 1992). *Moringa pterygosperma* is also known as “clarifier tree” due to flocculating properties of the seeds and is employed in the treatment of drinking water in rural areas of Asia and Africa (Eilert *et al.*, 1980, 1981; Faizi *et al.*, 1994).

In addition to the antimicrobial activity, there were several reports concerning investigation on the constituents of this plant. The thiocarbamates (Faizi *et al.*, 1992) and nitrile and mustard oil glycosides from this plant (Faizi *et al.*, 1994)

were found to possess hypotensive activity. Abortifacient effect of the ethanolic extract of its fresh leaves (Nath, 1992), antifertility effect of the aqueous extract of its roots (Shukla, *et al.*, 1988, 1989) and sterilizers with this plant in the recipe (Lal and Lata, 1980) have been reported.

In view of the fact that there have been many studies on ethnological and pharmacological activities of this plant, this investigation will therefore deal with the isolation, purification and identification of chemical compound(s) present in the stem bark of the plant, in order to contribute to the knowledge of the constituent(s) of this species. The results of this work are expected to provide valuable information in the fields of chemotaxonomy and phytochemistry.



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