



## A Comprehensive Review on *Meyna laxiflora* Robyns (Rubiaceae)

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Accepted on: 04-09-2015; Finalized on: 30-11-2015.

### ABSTRACT

*Meyna laxiflora* is a small or medium size tree, which having traditional importance for its medical uses, for treatment of Inflammation, Gastrointestinal disorder etc. It is distributed in tropical and subtropical region all over the world. In India it is available in Assam, Bengal, Konkan, Deccan etc and wildly available throughout Satpuda region mainly in Sawarimal, Umarpata, Morkaranja and kondaibari villages of Nandurbar district. This review presents detailed survey of literature on phytochemical and medicinal properties of the plant which will be beneficial for exploring its phytochemical and pharmacological properties. The chemicals reported from the plant belong to different classes such as carbohydrates, starch, proteins, tannins, saponins and alkaloids. Thus, indicating the potential of the plant in pharmaceuticals and in indigenous systems of medicine. The notable pharmacological properties include anti-diabetic, antioxidant, antibacterial, antifungal and many more activities which are yet to be explored.

**Keywords:** *Meyna laxiflora*, *Vangueria spinosa*, *Rubiaceae*.

### INTRODUCTION

**M**eyna is a genus of shrub and small trees distributed in tropical and subtropical region. Earlier *Vangueria spinosa* covers a group of plants from Meyna genus which are not discriminated in their botanical characters and economic uses.

Recently the plants has been separated and classified into eleven different species of *Meyna* with the help of molecular phylogenetics.<sup>1,2</sup>

- *Meyna grisea* (King & Gamble) Robyns
- *Meyna hainanensis* Merr
- *Meyna laxiflora* Robyns
- *Meyna parviflora* Robyns
- *Meyna peltata* Robyns
- *Meyna pierrei* Robyns
- *Meyna pubescens* (Kurz) Robyns
- *Meyna spinosa* Roxb.ex Link
- *Meyna tetraphylla* (Schweinf. Ex Hiern) Robyns
- *Meyna tetraphylla* subsp. *Comorensis* (Robyns) Verdc
- *Meyna velutina* Robyns

However, only *Meyna laxiflora* Robyns and *Meyna spinosa* Roxb.ex Link available in India which is considered as inseparable having difference only in flowers.

The *Meyna spinosa* Roxb.ex Link have flowers crowded into fascicles with shorter pedicels and petioles as compared to *Meyna laxiflora* Robyns.<sup>1</sup>

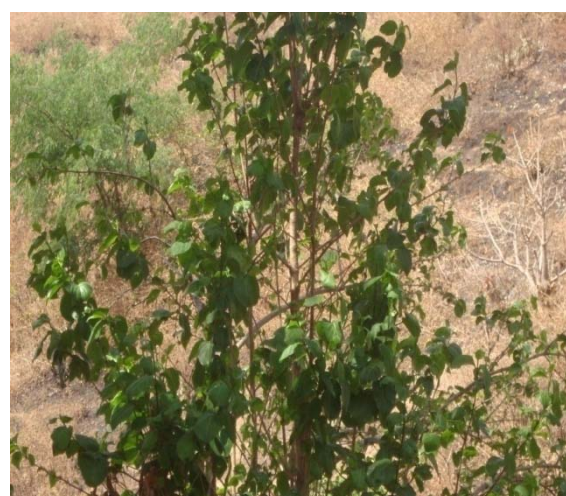


Figure 3.1: *Meyna laxiflora* plant

**Regional Names:**<sup>1,3,4,5</sup>

❖ Assamese:	Kutkura, Moin
❖ Bengal:	Mainphal, Muduna, Muyna, Muyuna
❖ English:	May-nuh
❖ Gujrati:	Alu, Atu
❖ Hindi:	Moina, Muduna, Muyuna
❖ Kannad:	Mullakare, gundkare, gobergally
❖ Marathi:	Alu, Huloo, Halawni
❖ Sanskrit:	Pindi, Pinditaka, Pindituka, Pindu, Nagakesarah
❖ Tamil:	Manakkarai
❖ Telgu:	Segagadda, Veliki, Visikilamu
❖ Urdu:	Main
❖ Uriya:	Monono, Montaphoo
❖ Local Name:	Alive, Awala, Alav, Olami, Ulama

**Taxonomy:**<sup>6</sup>

❖ Domain:	<i>Eukaryota</i>
❖ Kingdom:	<i>Plantae</i>
❖ Subkingdom:	<i>Viridaplantae</i>
❖ Phylum:	<i>Tracheophyta</i>
❖ Subphylum:	<i>Euphyllophytina</i>
❖ Infraphylum:	<i>Radiatopses</i>
❖ Class:	<i>Mangoliopsida</i>
❖ Subclass:	<i>Asteridae</i>
❖ Superorder:	<i>Gentiananae</i>
❖ Order:	<i>Gentianales</i>
❖ Family:	<i>Rubiaceae</i>
❖ Genus:	<i>Meyna</i>
❖ Specific epithet:	<i>laxiflora</i> –Robyns

**Synonyms:**<sup>1</sup>

*Vangueria spinosa* Hook

**Description**

Small or medium size tree, Bark light black, smooth. Leaves opposite or whorled, 3.5-15 X 1.2-10 cm, elliptic-oblong, shining, glabrous. Flower greenish yellow, in axillary cymes or fascicled on leafless wood. Fruits nearly globose, fleshy, smooth, purplish when ripe.<sup>6</sup>

**Distribution**

It is distributed in tropical and subtropical region all over the world.<sup>1</sup> In India it is available in Assam, Bengal, Konkan, Deccan etc.<sup>4</sup> It is wildly available throughout Satpuda region mainly in Sawarimal, Umarpata, Morkaranja and kondaibari villages of Nandurbar district.<sup>6</sup>

**Traditional Uses:**

- The tribe such as Pawara, Bhil, Tadavi and Vanjara of satpuda uses foliage as food.<sup>7,9</sup>
- The tribal community in Western Ghat region of Maharashtra uses young fruits as food and dried fruits as Narcotic and anti-dysentery.<sup>8</sup>

- The Chothe Tribe Bishnupur and Chandel districts of Manipur uses fresh leaves as chutney time to time to enhance blood purification and skin texture and fruits for constipation.<sup>10,11</sup>
- The Meitei community of the Imphal valley uses leaves as ingredient for preparation of Chinghi an herbal shampoo.<sup>12</sup> young leaf and fruits uses in treatment of helmenthiasis and hoarseness (abnormal change in voice due to throat infection)<sup>13</sup>
- The people of Golghat district of Assam uses fruits for anti-fertility activity<sup>14</sup>
- Five pinches of seed powder is mixed with water and given twice a day for 15 days for kidney stone in Nashik district.<sup>15</sup>
- The tribes of Khasi Garo and Jaintia hills of Meghalaya uses fruit mainly as food and rarely in brewing of wine<sup>16</sup>
- In North West Maharashtra people uses leaves for abdominal distention.<sup>17</sup>
- Tribes of Nashik district uses leaves for goiter or swellings by making smear of fresh leaves with coconut oil by slight heating.<sup>18</sup>
- The tribes of Tinsukia district of Assam uses seed powder with water as abortifacient.<sup>19</sup>
- Throughout India leaves are used for treatment of diphtheria, dysentery, indigestion and for removal of worms, the root paste is used for treatment of painful urination, the stem bark paste is used as a cure for boils and the seed powder is used as a narcotic.<sup>20</sup>

**Review of Pharmacognostic Study**

The pharmacognostic study of the plant is not reported exhaustively only S. Wangmo perform pharmacognostic study on leaf and stem of the plant. The investigation involves their macroscopic and microscopic studies such as quantitative microscopy, percentage extractives, ash values, fluorescence analysis, histochemistry and phytochemistry.<sup>20</sup>

**Review of Phytochemical Study**

- The qualitative and quantitative analysis of the leaf and stem of plant showed it to be rich in phytochemicals, like carbohydrates, starch, proteins, tannins, saponins and alkaloids. Thus, indicating the potential of the plant in pharmaceuticals and in indigenous systems of medicine.<sup>20</sup>
- Fruit contain Oxalate ( $0.8667 \pm 0.1527$ ), Phytate ( $0.2667 \pm 0.0577$ ), Tannin ( $1.06 \pm 0.0529$ ), and Saponin ( $53.366 \pm 0.472$ ).<sup>21</sup>
- Methanolic extract of seeds contain carbohydrates, glycosides, alkaloids, steroids, tannins, saponins, terpenoids, gums and mucilage.<sup>22</sup>



- Benzene extract of seed contain fats (38.5%).<sup>23</sup>
- Leaves contain a flavonoid (-)-epicatechin-3-O-β-glucopyranoside.<sup>24</sup>
- Seed contain oil and fatty acid with cetane number (50.42), saponification number(202.8) and iodine value (101.3)<sup>25,26</sup>
- The leaves contain essential trace element such as Fe, Zn, Cu, Mo, Cr, and Mn available in leaves  $1.02 \pm 0.005$ ,  $0.4342 \pm 0.014$ ,  $2.30 \pm 0.02$ ,  $0.011 \pm 0.001$ ,  $4.27 \pm 0.097$ , and  $0.014 \pm 0.002$  ppb respectively.<sup>27</sup>
- The fruit contain Nitrogen ( $0.44 \pm 0.004$ ), Phosphorus ( $0.15 \pm 0.004$ ), Calcium ( $325.10 \pm 0.066$ ), Potassium ( $1278.00 \pm 2.6$ ), Magnesium ( $99.5 \pm 0.90$ ), Iron ( $35.55 \pm 0.47$ ), Manganese ( $0.94 \pm 0.04$ ), Zinc ( $5.21 \pm 0.09$ ), Copper ( $0.84 \pm 0.03$ ), and Sodium ( $221.00 \pm 1.70$ ).<sup>28</sup>
- The ripe fruit pulp contain phenolic compound and condensed tannin<sup>29</sup>

### Review of Pharmacological Study

- Methanolic extract of seeds have good antioxidant activity. The IC50 values are  $84.2 \pm 2.1$ ,  $91.0 \pm 3.0$ , and  $104.5 \pm 3.4$  µg/ml for DPPH, H<sub>2</sub>O<sub>2</sub>, and NO radical scavenging method respectively.<sup>22</sup>
- A flavonoids isolated from leaf is significantly active against *Staphylococcus aureus*, *Escherichia coli*, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*.<sup>24</sup>
- Fruit of *Meyna spinosa* have anti-fungal activity against *Candida albicans*.<sup>30</sup>
- Methanolic and dichloromethane extracts of Fruit having have antioxidant activity<sup>31</sup>
- Ethanolic leaf extract of *Vangueria spinosa* have synergistic effect with doxycycline & ofloxacin against Gram-positive bacterium (*Staphylococcus aureus*) and three Gram-negative bacteria (*Escherichia coli*, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*).<sup>32</sup>
- Enzymes isolated from fruit of *Meyna laxilora* have highest peroxidase activity ( $0.006333 \pm 0.004619$ ).<sup>33</sup>
- Aqueous extracts of leaf have significant *in vitro* inhibitory effect on the vegetative growth of *Fusarium moniliforme* Sheldon.<sup>34</sup>
- Ethyl acetate, and methanolic extract of leaves of *Meyna spinosa* has beneficial effects, in reducing the elevated blood glucose level, alpha amylase activity and lipid profile of high fat diet-alloxan induced-diabetic rats.<sup>35</sup>

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Source of Support: Nil, Conflict of Interest: None.

