



## An Updated Review on *Xeromphis uliginosa*: An Underutilised Plant

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### ABSTRACT

*Xeromphis uliginosa* (Retz) Maheshwari, an underutilised potential plant of the family Rubiaceae. The plant is distributed in dry and moist deciduous forests, native to Bangladesh, India, Sri Lanka and Thailand. The ethnic communities uses the parts of the plants as a vegetable and curing various ailments like cholera, diarrhoea, dysentery, eye complaints, pimples, diuretic, tonic properties, biliousness etc. The unripe fruit is astringent. It is also used as colour intensifier in dyeing and leaves are good fodder for cattle and deer. Efforts have been made by researchers to verify the claims for curing various ailments. The present updated review is an attempt to highlight the various ethnobotanical, ethnomedicinal uses as well as phytochemical and notable pharmacological reports of the plant.

**Keywords:** *Xeromphis uliginosa*, ethnobotany, phytochemistry, pharmacology.

### INTRODUCTION

Nature has provided a treasure trove of phytoresources for curing all ailments of mankind<sup>1</sup>. Phytotherapy have become more popular in recent years because it has been verified that they do not have any side or toxic effects as compared to the modern medicine<sup>2</sup>. In recent years, due to degraded environment and fast urbanisation and big population, climate change and fast disappearing of plant species and ethnic practices occurs. Exploration of newer source of vegetation especially unexplored underutilised local food resource have become fascinating area of interest for bringing health care and sustainability. Exploration, documentation and through literature survey revealed an interesting fact that the plant is becoming more popular in curing various ailments and also used as vegetable. Very little attempt have been made to verify its efficacy through scientific screenings. Hence it is necessary to update the information in a review form to pinpoint the underexploited potential of this plant species.



Figure 1: Photographs of *X. Uliginosa*

### SYNONYMS<sup>3, 4</sup>

*Gardenia uliginosa* Retz., *Catunaregam uliginosa* (Retz.) Manilal & Sivar, *Randia uliginosa* (Retz.) Poir, *Xeromphis uliginosa* (Retz.) Maheshwari, *Gardenia pomifera* Wall, *Posoqueria uliginosa* (Retz.) Roxb, *Solena uliginosa* (Retz.) D. Dietr.

### BOTANICAL DESCRIPTION<sup>5, 6</sup>

*Xeromphis uliginosa* (Retz.) Maheshwari is a small tree belonging to the family Rubiaceae rarely reaching the height of around 6m. Bark is reddish brown in colour and scaly appearance. Branches are thick, horizontal and numerous. Many of them are short and terminating in 1-2 pairs of strong sharp thorns of 1.3cm long. Fruits are 5-6.3cm long, ovoid, smooth, yellowish brown, crowned with the persistent calyx. Seeds numerous, compressed, smooth and closely packed in pulp. Flowering and Fruiting in the period of April – August.

### ETHNOBOTANICAL AND ETHNOMEDICINAL USES

*Xeromphis uliginosa* (fig 1) is widely used in Ayurveda, Siddha and Unani medicine. In Ayurveda it is described as single drug for aborting accumulated phlegm, bile and internal toxic substances while in Unani it is considered as aphrodisiac, haematinic & good for heart and also used in biliousness, dysuria and strangury.

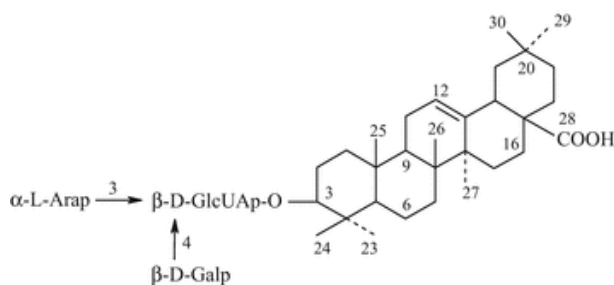
The unripe fruit roasted in wood ashes is used as a remedy in diarrhoea and dysentery, cholera, boils and gastric troubles. Fruit powder with honey is given to flush out the intestinal worm. Roasted fruit pulp used as colour intensifier in dyeing. Fruit juice is used for hair care. Its regular use makes hair free from dandruff and lice. Boiled fruit with sugar used before sunrise internally used for the treatment of migraine. It is also used for fish poisoning. Unripe fruit is eaten as vegetable either alone or together with other vegetables in curries. Fruits are used as famine food in flood prone areas because it has

good keeping quality. It has tonic properties and cooling effect. Leaves are used as fodder for cattle & deer. It is also consumed during winter season for general health. Root is diuretic and used in biliousness, disuria, strangury, aphrodisiac, boils. Bark decoction is used in the treatment of diarrhoea and dysentery. Bark powder with egg, turmeric and calcium used for bone fracture. Stem bark of *Helicteres isora* Linn along with that of *Xeromphis uliginosa* and a whole plant of *Bacopa monnieri* Wettst (10 g each) are used in treatment of cold and cough. Wood is used as timber in packing cases & articles. Decoction of wood used in treatment of diabetes mellitus.<sup>7-16</sup>

## PHYTOCHEMISTRY

The fruit of *Xeromphis uliginosa* contains a saponin of oleanolic acid, mannitol (upto 6 % in unripe fruits)<sup>17</sup> (Fig.2). Various researchers isolated saponins & mannitol also from the bark.<sup>18,19</sup>

Nutritional analysis of fruits showed that it has moderate level of moisture (86.6 %), Protein (0.58 %), Fat (0.24 %), Reducing sugar (6.6 %), Non reducing sugar (2.19 %), Total sugar (8.8 %), Fibre (2.88 %), Mineral matter (0.81 %), Vit. C (62.19 mg/100g), Iron (1 mg/100 g), Sodium (5.8 mg/100 g), Potassium (170 mg/ 100g), Calcium (33 mg/100g), Phosphorus (13mg/100g) and Calorific value (56 cal/100g).<sup>20,14</sup>



**Figure 1:** Glycosides of Oleanolic acid isolated from *X. uliginosa*

Destructive distillation of wood gave (on dry wt. basis): charcoal, 30.4; tar, 9.6; pyrolygneous acid, 39.7 (acid, 5.0; ester, 3.7; acetone, 2.7; methanol, 1.4); pitch and losses, 1.7; and gas 18.5%.<sup>14</sup>

The preliminary phytochemical analysis of fruits showed that the fruit contains alkaloids, coumarin, cardiac glycosides, glycosides, phenol, saponins and tannins. The proximate analysis of fruits showed that it contains Carbohydrate (0.4mg/100mg), Starch (0.43mg/100g). Total Chlorophyll content in fruits was found to be very low (0.001 mg/g tissue). Total phenolic content (931 mg/100mg), total ash (3.50%), Acid insoluble ash (0.50%), water soluble ash (5.50%), Sulphated ash (6%), Alcohol soluble extractive value (0.93 %), Water soluble extractive value (5.5 %), Foaming index (<100) and Swelling index (11.5 ml/g powdered sample) were observed.<sup>21</sup>

## PHARMACOLOGICAL AND TOXICOLOGICAL ACTIVITIES

### Anti-diarrhoeal activity<sup>22</sup>

In a study the anti-diarrhoeal effects of ethanolic (90 %) extract of dried fruits of *Xeromphis uliginosa* was evaluated against castor oil-induced-diarrhoea model in albino rats. This study showed the significant role of ethanolic fruit extract as an anti-diarrhoeal agent.

### Toxicological evaluation<sup>23</sup>

In vivo and in vitro toxicological evaluation of ethanolic extract of *Xeromphis uliginosa* in experimental animals (male albino rats) shows that the doses consumed in the traditional medicine may be considered as relatively safe. It did not cause either any lethality or changes of in the general behaviour in both the acute & chronic toxicity studies.

## CONCLUSION

Literature available on *Xeromphis uliginosa* depicted the fact that it is a popular remedy among the ethnic community. Very little efforts have been made by the researchers to explore the therapeutic potential of fruits of this plant. Other parts of the plant such as roots, leaves and bark (posses important medicinal virtues) are not explored scientifically for their biological potential. In further studies the other plant parts as well as isolated components need to evaluate in scientific experimental models and clinical trial to understand the mechanism of action.

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