Embelia ribes Burm F. an endangered medicinal plant need an immediate conservation attention.

Veena kumari and P.k.mishra

P.G.Dept of Botany, Vinoba Bhave University. Hazaribag, Jharkhand-835301.

Abstract :

Embelia ribes Burm belongs to family Myrsinaceae is a woody shurb sparsely distributed in the moist deciduous forests of the western ghats of India, South Asia and Malaysia. *Embelia ribes* is a red listed medicinal plant species that contain embelin which has wide clinical applications. Due to over exploitation of this species its comes under endangered medicinal plants that needs immediate conservation attention.

Key words: *Embelia ribes*, Myrsinaceae, Endangered, Embelin.

Introduction :

Embelia ribes is a red-listed medicinal plant species that contain embelin, which has wide clinical applications. Its great demand in Ayurveda and the pharmaceutical industry (>100 t/yr) has imposed tremendous pressure on natural populations from the Western Ghats of India(Mhaskar *et al* 2011). The drug gained particular importance in view of the wide experimental and clinical trials on its contraceptive potential (Anonymous 1990). Conventional propagation of *E.ribes* is via seeds and vegetative means which are time consuming and seldom successful.

Plant profile:

Kingdom : Plantae

Phylum : Angiosperms

Order : Ericales

Family : Myrsinaceae

Genus : Embelia

Species : ribes

Taxonomy:

Embelia ribes Burm. f., A straggling, large scandent shrub having long branches, with slender, flexible, terete and long internodes, the plant is almost a climber .

The bark of the species is studded with lenticels. Having whitish gray, studded with lenticels stem ,with a mature girth of 45-72 cm. Leaves are elliptic, coriaceous. 6-14cm

long and 2-4cm broad lancelate , alternating, acuminate entire, perfectly glabours and petiole 1.0 cm -0.8 cm margined. Flowers are small, greenish-yellow, numerous in lax panicled racemes. Flowering time is February. Fruits are berry, globular and 2.4-4.0 mm in diameter with warty surface, smooth, succulent. The colour of fruit is dull black and rarely dull red like peppercorn when dried. The roots are brownishgray, with hairy reddish rootlets.

Synonyms of *Embelia ribes:*

Sanskrit -Jantughna, Krmighna, Vella, Krmihara, Krmiripu

Ayurvedic name- Viavidang,Bai bidang Krimighna, Chitramandula,Valle

Unani name -Baobarang, Babrang

Hindi name- Baberana, Wawrung, Vayavidanga, Bhabhiranga.

English name- Embelia

Common name- Vidanga

Habitat:

Embelia ribes Burm.f. is a red listed climbing shurb found in the hilly parts of India from the central and lower Himalayas down. It is commonly seen in places up to the height of 1500 m. It is,also found in Sri Lanka, Singapore, South China and Malayan archipelago. in India It is distributed in moist deciduous forests of the Western Ghats of South India, Jammu & Kashmir, Arunachal Pradesh, Himachal Pradesh, Madhya Pradesh, Uttar Pradesh, Assam and Maharashtra. It is available throughout India up to an altitude of 5000 feet (Guhabakshi,*et al* 2001).

Chemical components:

Embelia ribes is most widely used in traditional herbal medicine in India. The ripe fruits of *E.*ribes are the most commercially important part of the plant as they have been found to contain the active compound namely Embelin (Khanderwal 2008). Further phytochemical investigation resulted in three new compounds namely embelinol, embeliaribyl ester and embeliol. Another compound namely Vilangin was isolated from the ripe fruit berries (Srinath *et al* 2010). The plant has also been found to contain quercitol and fatty ingredients, an alkaloid, christembine, a resinoid, tannins and minute quantities of a volatile oil (Shankarmurthy etal 2004). It has also been studied that the seeds of *E.ribes* showed the presence of Cr,K, Ca, Cu, Zn and Mn along with high carbohydrates (Arora *et al* 1971). The berries of *Embelia ribes* contain several chemical constituents like embelin or embelic acid, resin, tannin, volatile oil, fixed oil, christembine (alkaloid) (Henry G *et al* 1999), phenolic acids like vanillic acid, cinnamic acid, chrorogenic acid, caffeic acid, o-cumaric acid (Shradda *et al* 2009). In the berries of *Embelia ribes* about 4.33% of the embelin content is observed (Sudhakar Raja *et al* 2005). Embelin is water insoluble, but forms a water soluble, violet colored complex, in

alkaline medium (Patel,R *et al* 1997). Plant contains potassium embelate, 2, 5-dihydroxy,3-undecyl-1,4-benzoquinone, embelin, quercitol, fatty ingredients, vilangin (Shradda *et al* 2009) . Phytochemical investigation of the seeds revealed 3 new compounds identified as 3 –(4”- hydroxyoctadecanyloxy)–p-quinonyl-5-methylene-8-(10-pentanyloxy)-p-quinine (embelinol), n-pentacosanyl-nnonadeca-71 -en-91 –alpha–ol-11 -oate (embeliaribyl ester) , 1,2,4,5-tetrahydroxy 3-undecanyl benzene (embeliol) and a known compound embelin.

Embelin:

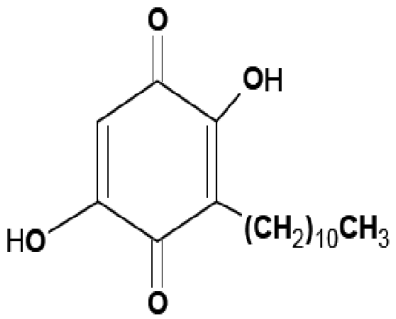
CAS number: 550-24-3

Molecular formula: $C_{17}H_{26}O_4$

Molecular weight: 294.39 g/mol

Chemical name: 2,5-Dihydroxy-3-undecyl-1,4-benzoquinone.

Common name- Embeline.



Chemical structure of Embelin.

Pharmacological activity:

The pharmacological and clinical investigations by vaeious workers gave promising results about its antifertility activity without any side effects (Mitra 1995, Anon 2002). Tabassum and Agrawal (2003) worked on hepatoprotective activity of *Embelia ribes,* they reported thet plant commonly named as vidanga is useful in jaundice. It is a constituent of various formulations marketedfor liver ailments. The fruits, leaves and roots are used to cure various diseases (Jha and Pandey 2008). It is mainly used as an anthelmintic, carminative and stimulant. It is also used in treatment of abdominal disorders, lung diseases, constipation, indigestion, fungus infections, mouth ulcer, sore throat, pneumonia, heart disease and obesity (T. joshy *et al* 2007). *Embelia ribes* has been shown to possess astringentcarminative, stimulant, antioxidant, anti-spermetogenic (Seth *et al* 1982, Radhakrishnan *et al* 1975) anti-bacterial (Chitraa *et al* 2003) and anticancer activity (Seok ahn *et al* 2007, Nikolovska-coleska *et al* 2004). Dried berries have been used in India since ancient times as an antihelminthic. In addition, dried berries are also reported to inhibit enzymes such as pancreatic lipase, alpha amylase and trypsin.

Conclusion :

Embelia ribes is one of the 32 medicinal plant species identified by the Medicinal Plant Research Board, Govt. of India, New

Delhi, as being important for large-scale cultivation because of its commercial use. *Embelia ribes* has been proven to have great pharmacological potential with a great utility and usage as folklore medicine. *E.ribes* which possess high trade potential, is one such species that needs Immediate conservation attention. It is an endangered medicinal plants therefore, development of a mass multiplication protocol is a necessary pre-requisite for *ex situ* conservation and augmentation of this plant genetic resource. Artificial regeneration of this species is difficult due to its poor seed viability, low rate of germination and poor rooting from stem cutting. Micropropagation through tissue culture having resident meristems is recommended to multiply this species that are difficult to propagate, rare or endangered.

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