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 shrub sparsely distributed in the moist deciduous forests of the western ghas 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 panicked 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 shrub 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 et al 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, chorogenic 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-nonadeca-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 various 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 that the plant commonly named as vidanga is useful in jaundice. It is a constituent of various formulations marketed for 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 astringent carminative, stimulant, antioxidant, anti-spermetogenic (Seth et al 1982, Radhakrishnan et al 1975) antibacterial (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.

References:

- Arora RB, Ghatak N, Gupta SP. (1971). Antifertility activity of

review of *Embelia ribes*. *IJPT*: vol. 2(4) 525-539.

