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Review Article

Review On Embelia Ribes And It's Pharmacological Activity

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ABSTRACT

Embelia ribes is a kind of Embelia. Burm. F. Is a member of the Myrsinaceae family, which grows in Hilly areas of India up to 1500 metres in elevation, from the outer Himalayas to the Western Ghats. Embelia ribes Burm. F. Is a rare medicinal plant that has been studied extensively for its diverse Medicinal characteristics. The use of medicinal plants in therapeutics is perhaps as old as recorded History. Embelia ribes is one of most significant medicinal plant. Nearly each part of this plant contains Varied chemical constituents and is utilized within the treatment of various. Broad inquire about work Has been detailed in last few decades on this important plant of Embelia ribes berries contain a few Chemical constituents like embelin, volatile oil, fixed oil, resin, tannin, christembine, phenolic acids Like caffeic acid, vanillic acid, chrorogenic acid, cinnamic acid, o-cumaric acid 4.33% of the embelin Content is observed within the berries of Embelia ribes Burm F. It is a critically endangered medicinal Plant known for its digestive, carminative, and laxative effects. Embelia ribes also has the following Properties: Antihelminthic, antibacterial, antioxidant, anti-diabetic, anticonvulsant, anti-cancer, and Antihyperlipidemic, Antifungal, Antihyperhomocysteinemic, Molluscicidal, Wound healing, Antifertility, Antihyperglycemic, Antitumor and anti-inflammatory, Chemotherapeutic, Contraceptive, Anxiolytic, Antidepressant, Antimitotic, Cardio protective effect, Antiobesity, and Antihyperlipidemic Are all treated with it. Embelia ribes was studied for its hepatoprotective and analgesic properties.

INTRODUCTION

The herbal plants are used for medicinal Purposes since ancient times for the prevention and Treatment of various diseases. The herbal remedies and The preparation made from herbal plants are already Described in ancient books such as Vedas and the Bible. The traditional medicinal

system has been widely Accepted by the developed countries in recent years. Traditionally, the crude extracts of the herbal plants are Used by the local communities or rural people for Medicinal and other purposes. In India, about 15000 Plant species are used as a source of medicine because of The presence of its various

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chemical constituents like Saponins, tannins, alkaloids, alkenyl phenols, flavonoids, Etc. The herbal plant named Embelia ribes is a woody climber plant that belongs to the family Myrsinaceae. It is commonly called as Vidanga or false black pepper. As per the Medicinal Board, Govt. of India, the E. ribes plant is considered as the most significant plant out of the 32 medicinal plants for its large-scale cultivation and commercial use. The fruit of this plant is used as a carminative, anthelmintic, alterative and as stimulant. The major chemical constituent extracted from this plant is embelin, which carries great medicinal value and is used to cure various ailments and diseases. The plant extracts are used to treat diseases like abdominal pain or disorder, constipation, lung disease, mental disorders, epilepsy, indigestion, sore throat, pneumonia, heart diseases, lungs disorders, mouth ulcers, fungus infections, cough and obesity. Traditionally, the plant is used to treat diseases like vomiting, arthritis, tonsillitis, flatulence, jaundice, bloating, gastritis, contraceptive, skin diseases, toothache and blood detoxification. In the Unani medicinal system, the seeds of the plant are specifically known for their anthelmintic property that is used to expel out phlegm and black bile from the joints. Besides this, due to the presence of various phytochemicals, it carries various therapeutic and pharmacological properties like antibacterial, antifertility, analgesic, hepatoprotective, cardioprotective, antioxidant, neuroprotective, anti-inflammatory, antitumor, wound healing and anthelmintic property.



OFFICIAL NAMES OF EMBELIA RIBES:

English:

false black pepper, white-flowered embelia.

Hindi:

Baberang, Karkannie, Vayvarang, Viranga.

Sanskrit:

Chitra-tandula, Janthunashana, Suchitra-vija, Vrishanusana, Vidanga.

Bengali:

Biranga, Babarang, Bhai-birrung.

Urdu:

Bao badang.

Marathi:

Amti, Ambat, Vaivarang, Vavdinga.

Tamil:

Vaividangam, Vayu-vilamgam.

Gujarati:

Vavding, vavading, vayavadang.

CLASSIFICATION

Kingdom:

Plantae

Phylum:

Angiosperms

Clade:

Tracheophytes

Clade:

Angiosperms

Clade:

Eudicots

Clade:

Asterids

Order:

Ericales

Family:

Myrsinaceae

Genus:

Embelia

Species:

ribes

BIOLOGICAL SOURCE:

Embelia ribes (ER) commonly known as Baobarang, a large woody climbing shrub, is widely distributed in the moist deciduous forests of the Western Ghats, India, Sri Lanka, Malaysia and South China.

Family:

Myrsinaceae.

GEOGRAPHICAL SOURCE:

The plant is distributed in countries like Sri Lanka, Singapore, South China and the Malayan Archipelago. Embelia ribes are native to hilly parts of India grown up to an altitude of 1500 m elevated from The outer Himalayas to the Western Ghats. In India, it is Mainly found in the semi-evergreen and the moist Deciduous forests of the Western Ghats of South India And the states of Jammu and Kashmir, Arunachal Pradesh, Madhya Pradesh, Himachal Pradesh, Assam, Uttar Pradesh and Maharashtra .

CHEMICAL CONSTITUTENTS:

Embelia ribes contain Embelin(2,5-dihydroxy-3-undecyl-1,4-benzoquinone) a naturally occurring alkyl substituted hydroxy benzoquinone, & Quercitol, Fatty ingredients, Alkaloid - Schistembine, a Resinoid, Tannins and minute quantity of volatile oils.

CULTIVATION, COLLECTION AND MARKETING OF CRUDE DRUG:

E. ribes is propagated through seeds. Planting in the Field Land Preparation and Fertilizer Application: Crop is raised through direct sowing of seeds in the field during June-July. The field is

well ploughed followed by harrowing to bring the soils to a fine tilth and free from weeds.

PROPAGATION:

E. ribes is propagated through seeds.

Agro-technique

- Planting in the Field Land Preparation and Fertilizer Application: Crop is raised through direct sowing of seeds in the field during June-July. The field is well ploughed followed by harrowing to bring the soils to a fine tilth and free from weeds. The application of organic manure (FYM) at the rate of 5-10 t/ha is recommended.
- Transplanting and Optimum Spacing: Seeds are sown directly in the field at optimum spacing of 1.0 X 1.0 meter.
- Inter cultural Operations: The inter culture operations like weeding, protective irrigation, support or staking are to be done periodically as and when required.
- Disease and Pest Control: No major disease and pest is noted. However, in case of severe infestation bio-control measures are to be adopted.

MORPHOLOGY OF EMBELIA RIBES:

- It's a large, scandent bush with long branches; thin, pliable, linden roman shades internodes, and Long branches. The stem is white grey in colour, speckled with intercellular spaces, and measures 45-72 cm in diameter at maturity.
- Lenticels are strewn throughout the bark.
- Lanceolate leaves are 6-14cm long and 2-4cm wide.
- Coriaceous leaves are 5X3 cm long, elliptic, obtusely acuminate, whole, glabrous on both sides, Shiny above, with a round or sharp base and many primary nerves.
- Petioles are glabrous and margined.
- Fruits are globular, 2.4-4.0 microns in thickness, smooth, and tasty, with a hairy texture.



- Fruit is usually a grey black colour, although it may also be a dull red colour.
- Flowers are tiny, greenish-yellow, and borne in panicle racemes that are slack.
- Sepals are connate, widely triangular, ovate, and ciliate, and the calyx is minute.
- Petals are five and unattached, while stamens are five but shorter than petals.
- The month of February is when the flowers bloom.
- Size: 2.4-4mm
- Colour: Blackish Brown
- Shape: sub globular
- Odour: Divergent
- Texture: Crumple.

AYURVEDIC PROPERTIES:

- GUNA (Quality): Laghu, Ruksha, Tikshan
- RASA (Taste): Katu, Kashay
- VIPAK (Metabolism): Katu
- VIRYA (Potency): Ushan
- PRABHAV (Impact): Krimighna

PHARMACOLOGICAL USES:

The reported studies on the E. ribes plant have shown its therapeutic and pharmacological properties like analgesic, antibacterial, antifertility, antiprotozoal, indigestion, fungus infections, pneumonia, antioxidant, anti-inflammatory, anthelmintic, anticancer, anticonvulsant, wound healing and anti-hyperlipidaemia. A brief view of these properties of the E. ribes plant is described below.

ANTIBACTERIAL:

The methanolic and aqueous extract isolated from the E. ribes plant showed moderate antibacterial activity against multi-drug resistant Salmonella typhi. The embelin component isolated from the E. ribes plant showed significant antibacterial activity by inhibiting the growth of Staphylococcus aureus, Streptococcus pyogenes, Shigella flexneri, S. sonnei and Pseudomonas aeruginosa. The ethanolic extract isolated from the seeds of the E.

ribes plant show mild antibacterial activity against Staphylococcus aureus, Enterobacter aerogenes and Klebsiella pneumonia but did not produce anti-microbial activity against Pseudomonas aeruginosa, Staphylococcus aureus and Escherichia coli.

ANTHELMINTIC:

The seed oil of the E. Ribes plant was examined for its anthelmintic activity against Pheretima posthuma. The seed oil was given orally at three doses i.e. at 10 Mg/ml, 50mg/ml and 100mg/ml which showed a Significant death of the worms (Pheretima posthuma). In The bioassay, the three concentration of oil were studied In which the time of paralysis and time of death of the Worm was determined. The E. Ribes showed the best Anthelmintic property when compared to the other plants Like Gynandropsis gynandra, Impatiens balsamina, Celastrus paniculata and Mucuna pruriens. The Ethanolic extract isolated from the fruit part of the plant Showed an anthelmintic activity up to 93% against Gastrointestinal nematode larvae named Haemonchus Contortus. The preparation made of Vernonia Anthelmintica seed and the fruit extract of Embelia ribes Was studied for its antinematodal activity against goats. The EPG (egg per gram) count was made in the feces Before and on the 3rd, 10th and 15th days of the Treatment. The data of the 15th day of administration Showed that the 2g/kg of powder, its equivalent amount Of the methanol extract and 0.01 g/kg of morantel Significantly decrease the fecal eggs per gram (EPG) Counts in the goats suffering from mixed gastrointestinal Nematode in.

ANALGESIC:

The embelin component and its salts showed analgesic activity in which the 2:5 isobutyl amine embelin showed the significant analgesic property. After the intraperitoneal administration, the analgesic effect was noticed but not after subcutaneous, intramuscular, or oral



administration. After the intravenous injections, a significant analgesic effect was observed in dogs and cats. The antipyretic and anti-inflammatory activity of the embelin and 2:5 isobutylamine component was also noted. Another study was conducted in rats and mice where the embelin component of the *E. ribes* plant was studied for its analgesic activity. The effective results of embelin were shown when it was administered orally, intramuscular and ICV (intracerebroventricular) routes and then compared with morphine. The potassium embellate acts centrally to create an analgesic effect that is not antagonized by naloxone indicating a different central site of action. Due to its high oral efficacy and non-narcotic property, this plant is more accepted than morphine. The potassium embellate is highly considered for its analgesic property because of its fewer side effects, high therapeutic index, absence of abstinence and long-term safety. Another study conducted by Zutshi et. al., revealed that the analgesic activity of potassium embellate is due to the involvement of mu and kappa binding sites in the brain. In another study, it was observed that the mono and dipotassium salts of embelin showed higher analgesic activity in visceral evoked response when compared with thermal evoked responses. It was also detected that potassium embellate possesses a strong affinity for the kappa type of opiate receptors. In another study, the effect of potassium embellate on neurotransmitter content in cerebrospinal fluid of dogs was observed where the drug significantly affected the levels of noradrenaline and acetylcholinesterase activity.

ANTIOXIDANT:

The aqueous extract of the *E. Ribes* plant was Examined for antioxidant activity in the streptozotocin-Induced diabetic rats where the extract was given orally At doses 100mg/kg and 200 mg/kg of the body weight. The result showed a significant decrease in the Pancreatic superoxide

dismutase level, catalase and Glutathione level. At 200 mg/kg dosage, significant Protection against DTZ-induced oxidative stress was Observed. The ethanolic extract of the *E. Ribes* plant Showed a protective activity of β -cells against reactive Oxygen species-mediated damage by increasing cellular Antioxidant defense and decreasing hyperglycemia in Chemically induced diabetes. The reported studies On the kinetics and mechanism of reactions of embelin With hydroxyl, one electron oxidizing, organo-Haloperoxyl and thiyl radicals using nanosecond pulse Radiolysis technique proposed the use of embelin as a Competitive antioxidant in physiological conditions.

ANTIDIABETIC:

The aqueous extract isolated from the fruit of the *E. ribes* plant was examined for antidiabetic activity against diabetic rats. The diabetic rats were administered orally with the extract at the doses of 100 to 200 mg/kg for 40 days. Results showed a significant reduction in the heart rate, systolic blood pressure, blood glycosylated haemoglobin, blood glucose, serum lactate dehydrogenase, creatine kinase and increase in the blood glutathione levels in streptozotocin (administered at a dose of 40 mg/kg intravenously single dose) induced diabetic rats. The ethanolic extract isolated from the fruit berries was given orally for 6 weeks at a dosage of 100mg/kg and 200 mg/kg. Results showed a decrease in the blood glucose level, heart rate, systolic blood pressure in the streptozotocin-induced diabetic Wister albino rats. It was also revealed that the ethanolic extract decreased the pancreatic thiobarbituric acid reactive substances in the pancreatic tissues of diabetic rats.

ANTITUMOR:

From various reported studies it was found that the embelin component of the *E. ribes* plant exhibits significant antitumor activity when tested against



methylcholan-threne-induced fibrosarcoma in albino rats.

WOUND HEALING:

The ethanolic extract and embelin compound isolated from the leaves of *E. ribes* plant was examined for the wound healing activity by excision, incision and dead space wound models against Swiss Albino rats. Results showed the wound healing activity of ethanolic and embelin components of the *E. ribes* plant. A significant wound healing activity was observed in the embelin treated groups where the epithelialization of the incision wound was faster with the high rate of wound contraction. The tensile strength of the incision wound was significantly enhanced than the ethanol extract. In the dead space wound model, the weight of the granulation was increased indicating an increase in collagenation.

ANTIFUNGAL:

The test technique NCCLS was used to evaluate the antifungal activity of *Embelia ribes* utilising standard in vitro antifungal susceptibility (The national committee for clinical laboratory standard M27-A2 Protocol). The NCCLS approach demonstrated that the methanol extract of *Embelia ribes* and embelin had the lowest MIC50 range of 120 mg/L against *Candida albican* (MTCC no. 183) and that embelin had the highest MIC50 range of 120 mg/L among the four *Candida* species tested MIC50.

ANTIHYPERLIPIDEMIC:

When compared to pathogenic diabetic rats induced by streptozotocin (at a dose of 40 mg/kg intravenously), ethanolic extract of *Embelia ribes* administered orally at a dose of 200 mg/kg for 20 days showed a significant ($p < 0.01$) decrease in blood glucose, serum total cholesterol and triglycerides, and an increase in HDL-cholesterol levels. The extract also reduced thiobarbituric acid reactive substances in the liver and pancreas. (TBARS) values ($p < 0.01$) when compared to

TBARS values of liver and pancreas of the pathogenic diabetic rats.

CONTRACEPTIVE:

Plants were identified and collected around India in the hunt for historically medicinal plants with contraceptive potency, most of which were purchased from Ayurvedic remedy sellers. Different organic solvents were used to air dry, cut, and process the plants. Rats, mice, and hamsters were used to test the herbs' contraceptive qualities. Orally administered doses of 100-200 mg/kg of 137 plants were given to 5-6 animals per plant. 27 appeared promising enough to warrant additional investigation, with adult rats receiving 2-3 extracts from each plant. 14 plants were shown to have contraceptive properties. *Artabotrya odoratissimus* Linn and *Embelia ribes* Burm were discovered to exhibit fascinating biologic features but string hazardous consequences.

CONCLUSION:

The medicinal scrambling shrub climber *Embelia ribes* Burm f. belongs to the Myrsinaceae family. Phytochemical screening of *Embelia ribes* Burm f. were used as standardising parameters in the current study. Identification of plants has become a key challenge in Ayurveda, Siddha, and other Indian traditional systems of medicine, as our source of information. The traditional use and research work on biological activity of *Embelia ribes* suggest that it could be used in treatment of several diseases such as Anthelmintic, Antibacterial, Antioxidant property, Anti-diabetic, Anticonvulsant, Anti-cancer, Antihyperlipidemic, Ascaricidal properties, Antifungal, Wound healing, Antihyperhomocysteinemic, Molluscicidal, Antifertility, Antihyperglycemic, Antinematodal, Antiproliferative, Antispermatic, Antitumor and anti-inflammatory, Chemotherapeutic, Contraceptive, Anxiolytic, Antidepressant, Antimitotic, Cardio protective effect, Anti-obesity, Hepatoprotective,



Analgesic activity and also more research work should be carried out on isolated constituent.

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