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Review Article

PHARMACOGNOSY OF EMBELIA RIBES BURM F

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INTRODUCTION

Embelia ribes Burm F., a medicinal woody climber, belongs to the Myrsinaceae family. It is also commonly known as false black pepper or vidanga. This species is reported to be vulnerable in the Western Ghats of Tamil Nadu and Karnataka states of India and at a lower risk in Kerala state of peninsular India (Ravikumar and Ved *2000*). *E. ribes* grows in semi-evergreen and deciduous forests at an altitude of 1,500 m, throughout India. It is considered to be vulnerable due to excessive harvesting, because of its many uses (it is used in 75 ayurvedic preparations). *E. ribes* is a highly valuable medicinal plant with anthelmintic, carminative, antibacterial, antibiotic, hypoglycemic, and antifertility properties (Mitra *1995*; Anon *2002*).

Natural regeneration of *E. ribes* is poor due to overharvesting and exploitation, more fragmented populations resulting in inbreeding, development of abortive embryos, and the slow germination of fertile seeds that are small in size (Anon *1990*). On the other hand, artificial regeneration of this species is difficult due to its poor seed viability, low rate of germination, and poor rooting from stem cuttings (Ved et al. *2003*). *E. ribes* is one of the 32 medicinal plant species identified by the Medicinal Board, Govt. of India, New Delhi, as being important for large-scale cultivation because of its commercial use (Anon *2008*). Unfortunately, traditional methods of propagation are not successful in the large-scale production of this species.

Embelia species identified by *Susruta* (Father of surgery*)* as anthelmintic, alternative & tonic,

Further Dr Harris found in ancient Arabian writing as birang-I-kabauli (lancet July 23, 1887) for remedy of tapeworm, Tribal societies identified a change in the uterine environment which inhibits the process of implantation

Modern world has been documented to possess significant anti-implantation-activity, pregnancy, & also possess anti estrogenic & weak progestational activity in rats & causes a disturbance in the hormonal levels & have a direct action on the behavioral system which act on hypothalamus & releasing factors thereby interfering the secretion of gonadotrophins

A List of secondary constituents is reported in *Table no 9* from which only *Embelin* & gomphilactone derivative as anti-fertility-activity, But *Embelin* reported at 50 mg / kg for 7 days shows potent oral contraceptive which possesses 85.71% anti-fertility-activity in rats believed to inhibits pregnancy at single dose regimen

Buts still number of constituents in *Embelia ribes* should prove storage property before extraction to provide a statistical data of active compounds as anti-fertility-activity for which either alone individually or combination of constituents is not reported which will be responsible for anti-fertility-activity

In the modern world found many steroidal anti-fertility synthetic molecules which leads to health hazardous in monthly cycles,atropy of muscular & nervous tissues & most of the world population is suffering from obesity & laziness in the human body,

As *embelia* possess non-steroidal & non hormonal moiety will have a hope to nullify the health hazardous system & eliminates unwanted physiological symptoms & expectation of new molecule & to prove its hormonal activity is still under controversy.

Synonym
Laksmana, Amalaki, Patala, Vidanga, Tandula, Jantuhantri, Gahvara, Krmighna, Citr tandula, Amogha, Vella, Kairali.
Vernacular names

SANSKRIT
Amodha, Amogha, Anthunashana Bhasmaka, Bidanga, Chibatandula, Chitra, Chitrabija Chitra-tandula, , Chitratandula, Citratandula, Gahara, Gardabha, Ghosha, J vidangaka, Jantughna, Jantunashaka, Kairala, Kapali, Kevala, Krimighna, Krimiha, Krimikantaka, Krimiripu, Krimishetru, Krmighna, Krmiripu, Mogha, Mrigagamini, Pavaka, Rasayana, Shudratandula, Suchitrabija, Tandula, Tundula, Tunduliyaka, Vara, Vatari, Vella, Vellah, Vidanga, Vidangah, Vidangam, Vrishanashana, Vrishnasana,

HINDI
Baba-rang, Baberang, Bhabhiramg, Karkannie, vaividang Vayvidamg, , Wawrung

URDU
Baobadang, Baobarang (babrang)

BENGALI
Bhaibirrung ,Biranga, vidang.

KANNADA
Amogha, Vayi-vulanga, Vayubaliga, Vayuvilanga, Vidanga, Vaayu vilanga, Vilanga, Varana, Vaayu-vilanga, Vayivilanga

MALYALAM
Tiriitticanni, Tiruvittikanni, Pu-valli, Vayi-valannam, Vilal, Vayvilankam, Visalam, Vishaul

MARATHI
Ambti, Baavdinga, Karkannie, Karkunnie, Vaavadinga, Vayvarang Vvavadinga, Waiwarang

ORIYA
Vidanga

TAMIL
Kattukodi, Vellal, Varnanai Vai vilangam, Vaivitankam, Vayu-vilangam, Vayu-vilamga, Vayivilangam, Vayvilankam

PUNJABI
Bavidang.

GUJARAT
Bavidang.

TELUGU
Potosul,Vaividungalu, Vayivilangamu, Vayu-vilangam-chettu, Vellal, Vidangamu, Vilangamu, Vayi-vitangamu, Vyivilangamu

Habitat
These climbers are 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(5000 ft), it is generally seen in areas of eastern India to Ceylon(Sri Lanka) and Singapore. & Ranges from India to Southern China and south to Indonesia; East Africa& identified on Malayan estates etc

DESCRIPTION[18]
A large scandant Straggling shrub with a long slender brittle stem, It is a Climbing[111] creeper shurb, flxible, and terete branches; bark studded with lenticels
Leaves simple, coriaceous, alternate, elliptic - ovate -lanceolate, smooth leaves gland dotted, short and obtusely acuminate, broad, entire perfectly glabrous,, . It is about 3 inch long and 1 ½ inches broad, shiny above. And nodulated. PETIOLE; 1.0cm to 0.8cm margined, MIDRIB; prominent

FLOWERS; small, greenish yellow to whitish-pink colored. In racemes at end of branches Small, globular
Fruits about the size of white pepper, reddish-brown to blackish. It is found in bunches. The outer covering of the fruit is fragile and inside the seed is spotted. With a small beak at the apex. The single seed is horny with a mildew-like appearance due to minute, crystalline powder, depressed at base

STEM; whitish grey, studded with lenticels with a mature girth of 45-72 cms

ROOT; brownish grey

ROOTLETS; hairy reddish.

FRUIT: The fruits are brownish-black on ageing, globular to sub-globular, 2-4 mm in diameter, and style at apex. In a few fruits, the pedicel along with persistent calyx is present. Surface is warty, pericarp brittle, enclosing a single seed, speckled with yellowish brown or white spots. Most of the seeds are striate.

Transverse section of fruit shows epicarp consisting of single row of tabular cells of epidermis, generally not distinct due to deposition of colouring matter.

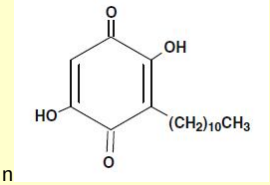
DISTRIBUTION[22]

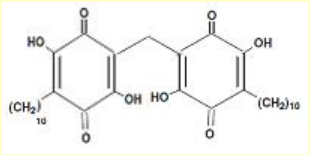
It is an Indo-Malaysian species, reported from India, SriLanka, Singapore, Malaysia and S. China. It is found to occur throughout India in Central Himalayas, Arunachal Pradesh, Assam, Maharashtra, Andhra Pradesh, Karnataka, Kerala and Tamil Nadu. This species is globally distributed in Indo-Malaysia. Within India, it is found throughout up to an altitude of 1500 m(5000 ft),

PHYSICAL CONSTITUENTS

Total ash 6 %, Acid insoluble ash 1.5 %, Alcohol soluble extractive 10 %, Water soluble extractive 9 %

Secondary constituents

S. No.	Active ingredients	Character
01	3(2H)-Benzofuran.	-
02	Christembine,	Crystalline compounds of embolic acid with soda, potash and ammonia
03	Daucosterol	-
04	di-hydroxy-embelin,	-
05	embelic acid	-
06	 Embelin	,(golden yellow needle like insoluble in water, soluble in alcohol /chloroform /benzene)dyes with silk & wool with alcoholic solution
07	embelin dimer	-
08	embelin disalts	-
09	embelin derivatives	-
10	New embelin derivatives.	-
11	Embelinol,	-
12	Embeliaribyl ester	as well as the common plant metabolites
13	Embeliol,	-
	Gomphilactone derivative,	-
14	Homoembelin,	-
15	Homorapanone,	-
16	Monopotassium embelate,	-
17	New compounds	-
18	A nitrogen containing alkyl 1,4-benazoqinone,	-
19	An unusual nitrogen-containing 3-alkyl-1,4-benzoquinone derivative[39],	-
20	N-(3-carboxylpropyl)-5-amino-2-hydroxy-3-tridecyl-1,4-benzoquinone (1),	-
21	A band of 906 bp,	-
22	Amplin of 594 bp,	-
23	Quarvital-1%	-
24	Quercitol,	-
	rapanone	-
25	Resins	
26	5,6-dihydroxy-7-tridecyl-3-[4-tridecyl-3-hydroxy-5-oxo-2(5H)-furylidene]-2-oxo-3(2H)-benzofuran (2),	-
27	palmitic	-

28	oleic	-
29	linoleum acid	-
30	sitosterol ,	-
31	Stable oil	-
32	tannins	-
33	daucosterol,	-
34	Cytotoxicities of the purified compounds	-
35	Vidangin	(colourless & crystalline k)
36	Vilangine, 	-
34	Volatile oil	-
35	Minor seed oil(fixed)	

Chemical classification

1	Aqueous solution	Alkaloids	Christembine
		Quinones	Vilangine, Embelin.
		Proteins	-
		Reducing sugars	-
		saponins	-
2	Ethanol extract	Fatty acids 5.2%	palmitic,oleic,linoleic acid. Sitosterol,daucosterol, Cytotoxicities compounds [19].
3	Organic solvents	Triterpenes, coumarins, resins,	-
4	Petroleum ether	Volatile oil, tannins, & Resins.	-

Reported extracts & its uses

S. No.	extract	Uses	Dosology
01	Fresh juice	Cooling, diuretic and laxative.	Leaves / fruit / root
02	Powdered fruit	Antifertility, 60%	fruit
03	Milk extract	Digestive & upper respiratory infection	Leaves / fruit / root
04	Aqueous extract	Hypolipodemic anthelmintic	(Leaves).
05	Aqueous extract	Antifertility, antioestrogenic, anthelmintic(tapeworms.) cardio protective, neuroprotective	(fruits-berries)
06	Aqueous-Ethanol extract	anthelmintic	(fruits-berries)
07	methanol extract	Prevent pregnancy 75%	(fruits-berries)
08	Ethanol extract	hepatoprotective , Antifertility, Uterine weight levels	(fruits-berries)
09	Butanol extract	Antifertility,	-
10	Benzene extract	Antifertility,51%	-
11	n-Hexane extract	anthelmintic	-
12	Petroleum ether	Tapeworm, (but not	-

	extract	round / hook) Prevent pregnancy75%	
13	chloroform extract	No Antifertility,37% anthelmintic	-
14	Acetone extract	Antifertility,	-
15	Ethyl acetate extract	Insecticidal activity	-
16	di-ethyl extract	-	-
17	Di chloro methane	-	-
18	Formic acid	-	-
19	Acetic acid	-	-
20	isopropanol	-	-
21	Hexane extract	Antifertility,	-

General uses

It acts as ascaricidal, anthelmintic, carminative, diuretic, astringent, anti-inflammatory, antibacterial and **febrifuge.** Active principles are found to be **estrogenic and weakly progestogenic.** Pulp is purgative. Fresh juice is cooling, diuretic and laxative. The root acts as be chic and anti-diarrhoeal. The seeds are spermicidal, oxytoxic and diuretic. The plant is also useful and known for its blood purifying properties. The effect of di-isobutyl amino derivatives shows anti-inflammatory, hypotensive and anti-pyretic effects. Aqueous extract of the fruit shows anthelmintic against tapeworms.

S. No.	Medicinal Uses
01	abortifacient activity (mice)
02	acne vulgaris:
03	Aflotoxin.(seeds medicinal value)
04	Alexeteric(fruit)
05	Alternative
06	Alterant(root)
07	Alpha -amylase activity.
08	amentia
09	Anorexia.
10	Anti-enteric
11	Anti-implantation.
12	Antibiotic
13	Ameliorative Anti-lipid in testis-
14	Anti-lipid in lowering potential ,
15	Antibacterial activity. (traditional)
16	Antibacterial activity(Synthesis)
17	Anti cestodal.
18	Anticoccidial system.(zycox)
19	Anticoccidial efficiency(e.tenella)
20	Antifungal activity. (plant screening)
21	Antifungal (insects-pests)
22	Antifungal(Phytopathogenic fungi)
23	Antifertility investigation.
24	Antifertility activity(plant screening)
25	Antifertility agent
26	Antifertility effects-Female Rats.
27	Antifertility-Female Rats.
28	Antifertility investigation(oral contraceptive)
29	Antifertility Early and Late Pregnancy.
30	Antifertility potential in Male
31	Antifertility properties
32	Antihyperhomocysteinemic activity.
33	Anti implantation

34	Antimicrobial evaluation.
35	Antimicrobial evaluation.
36	Antioxidant activity
37	antioxidant / antioestrogenic / antispermatogenetic
38	Antiviral activity.
39	Anthelmintic effect.(intestinal worms)
40	Anthelmintic effect.
41	Anthelmintic effect(nematode)
42	Anthelmintic efficacy
43	Anthelmintic potential(ovicidial& larvicidal)
44	Anthelmintic (t.muris)
45	Anthelmintics(phosphatase activity)
46	Antihyperhomocysteinemic activity
47	Anti-oestrogenic
48	anti-cestodal(antiparasitic)-
49	apoptosis inhibition
50	appetizer-
51	antiplaque activity / antidiabetic-
52	antioxidant activity
53	Alpha -amylase activity.
54	ameliorative(diabetic)
55	anti-oxidative stress in brain
56	anti-oxidant-13,astringent-
57	anti-coccidial efficacy(e.tenella infection)-
58	antihyperlipidemia
59	anti-oestrogenic
60	anti-spermatogenetic
61	anti-tubercular properties,
62	Antimicrobial evaluation.
63	Antiimplantation.
64	Antioxidant.
65	Antioxidant and neuroprotective effect.
66	Ascites.
67	Ascardi galli,
68	ascariasis
69	asthma
70	Astringent(leaves)
71	Anti inflammatory
72	Analgesic property
73	anodyne(fruit)
74	Bitter(fruit)
75	Brain tonic(fruit)
76	Bronchitis
77	Cattle ticks
78	cardiopathy
79	Cardio toxicity.
80	Cerebral ischemia
81	Carminative(fruit)
82	Cercaricidal Properties
83	Contraceptive activity.
84	Contraceptive activity with mineral salts.
85	Contraceptive Long acting.
86	Contraceptive orally
87	coccidiosis in avians(chickens)
88	coccidiosis in broilers
89	Colic(roots)
90	chronic dermatitis
91	constipation

92	carminative
93	cough,
94	Diarrhea,dysurea
95	demulcent(leaves)
96	dental caries
97	depurative(leaves)
98	Digestive(fruit)
99	diuretic(fruit)
100	dyspepsia(roots)
101	Emaciation and general debility
102	Extracts protectant
103	Ectozee(dogs)
104	Febrifuge(fruit)
106	fever
107	Family planning.
108	flatulence(roots)
109	Foetotoxic and teratogenic effects. ,
110	Fungus (amoeboidal parasites)-taencycopedia, glyc oprotein in tumour.
111	General body weakness & grain protectant.
112	Haematinic preparation.
113	haemonchis contortous parasite(anthelmintic effect),
114	hemicrania
115	Hepatocarcinogenesis.
116	Hymenolepiasis nana in childhood.
117	Hyperacidity[5], Hyperlipidaemia.
118	hyperhomocysteinemia.
119	Indigestion
120	insect pest on storage-
121	Inhibition of reproductive tissue.
122	Insecticidal activity.
123	Improves microcirculation in brain
124	Jaundice (Chopra, 1966 / jk 1966 / jk practitioner)
125	Laxative(fruit)
126	Lipid metabolism-
127	leprosy(leaves)
128	Long acting contraception.
129	Lymphadenopathy-h long acting contraception.
130	Mulloscicidal activity
131	Male antifertility potential.
132	Nutritive value
133	Nervine weakness
134	Nervous debility
135	Neuroprotective)
136	Obesity
137	odontalgia(roots)
138	Oestrogenic activity(bioassay)
139	Oestrogenic activity
140	Ovarectamised
141	Paralysis
142	Poultry lice(pestoban-D)
143	Pestoban (buffalocalves)
144	Pestoban (goats)
145	Pestoban (herbal mullosid)
146	Pestoban (canine demodecosis)
147	Poultry tape worm
148	Pruritis(leaves)

149	Psorptic
150	psychopathy
151	Pneumonia
152	Poultry common helminthes
153	Poultry lice.
154	Poultry tape worm
155	Pulse protectant
156	Pronutrients.
157	rheumatism
158	respiratory upper infection
159	repellant / antifeedant / insecticidal properties
160	Reproductive tissue inhibition
161	rejuvenating
162	Ringworm infestation
163	Root knots of okra(cake)
164	Toothache
165	Thermogenic(roots)
166	Tumour.
167	Tonic(root)
168	Scorpion string,Sarcoptic scabies in buffalo calves
169	Skin related problems
170	Stimulant
171	stomachic(roots) (leaves)
172	Storage(against insect pest)
173	Storage(grain protectant)
174	strangury
175	Snake bite,
176	Uterine weight increase.
177	Veterinary-Tapeworm.
178	Vitiatedconditions of kapha and vatha
179	Vulnerary(fruit)
180	worm infestation
181	Wound healing activity.
182	Zycox(lesion sores in chicks)
183	Zycox(ihp-250c) in broiler chicks

AYURVEDIC PROPERTIES

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

Tissue Culture terms

01	Direct shoot organogenesis[27]
02	High frequency plant regeneration[35,]
03	Micropropagation[25]
04	Rapid adventitious organogenesis[37]
05	Somatic embryogenesis[33]

Microbiological terminology

S. No.	Organisms
01	Ascaris lumbricoides[36]
02	avian coccidiosis.[43,]
03	balantidiosis in calves[101]
04	Callosobruchus chinensis L.[89]

05	canine demodecosis[62]
06	demodectic mange[54]
07	Eimeria necatrix[60]
08	E. tenella infection[102]
09	encephalitis virus.[87]
10	Gallus domesticus[47]
11	herbal molluscicide.[58]
12	Helminta-P[95]
13	-Helminta-Sonex[95]
14	Haemonchus contortus.[38]
15	Hymenolepiasis in childhood[109]
16	Merremia boisiana.[116.]
17	molluscicide Pestoban.[52]
18	Paramphistomum cervi.[67]
19	Salmonella typhi.[42]
20	Sarcoptic mange[53]
21	sarcoptic mange in goats[57]
22	Streptococcus mutans.[30]
23	Tribolium castaneum Herbst.[85]
24	Trichostrongylids[45]

Toxicology

It does not have any toxic effect on human body when consumed in normal doses.

Parts Used

Berries (fruit), leaves, root bark.

Visual deficits and retinotoxicity caused by the naturally occurring anthelmintics, Embelia ribes.[144]

Ancient Uses:

1. Paste – it is being used for mouth wash and avoiding cavities. It is being also used in skin related problems.
2. Powder – it is being used in wormal infestation, infections in body, indigestion, constipation, paralysis, convulsions, epilepsy etc. it also helps in purifying the blood.
3. Oil – it is used in skin related problems and wound infections.
4. Decoction - Decoction of the roots is given in insanity and heart diseases.

Formulations List

Abhyarista	Agnitundi vati	Ajamodadi churna
Amarsundari vati	Ardrak khanda avaleha	Avipatikar churna
Ayaskriti	Bhallatak rasayana	Brahma rasayan
Brhacchagaladya ghrita	Brhanmanjisthadi kvath churna	Brihanmarichadya taila
Brihat guduchi taila	Brihat phal ghrita	Brihat vidyadharabhra rasa
Chandanadi lauha	Chandraprabha vati	Dantodbhed gadantak rasa
Dashmularishta	Devadarvarishta	Dhanvantara ghrita
Draksharishta	Eladi ghrita	Gudapippali
Guduchi lauha	Haridra khanda	Jatiphaladya churna
Kalyanaka guda	Kasisadi ghrita	Kasisadi taila
Krimi kuthar rasa	Krimighan kashay churna	Krmimudgar rasa
Kumaryasava (a)	Kutajavaleha	Laghu cinkadik lehya
Lohasava	Madhukasava	Madhusnuhi rasayana
Maha yogaraj guggulu	Manibhadra yoga	Nagarjunanjan
Narayana churna	Navayas churna	Navayas lauha
Nimbadi churna	Nityanand rasa	Palashbijadi churna
Panchanimb churna	Panhatiktaguggulu ghrita	Pathyadi lepa
Pippaladyasava	Pippalyadi lauha	Pradarantak lauha

Punarnava guggulu	Punarnavadi mandoor	Puranchandra rasa
Rohitak lauha	Sadbindu taila	Sanjivani vati
Saptavimsatika guggulu	Sarasvatarishta	Sarvajvarahar lauha
Satmulyadi lauha	Sri bahusalo guda	Surana vataka
Taramandur guda	Vajraka taila	Vataraktantaka rasa
Vidanga lauha	Vidangadi churna	Vidangadi lauha
Vidangarishta	Vyosadi guggulu	Yogaraj guggulu

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