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Botanical Standardization of the Embeli Ribes Burmf & Possibilities of Species Substitute

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Abstract- EmbeliaribesBURM. F. is an important drug of Ayurveda. Which is considered as multi remedies *with wide* group of Active consistents.Isolated from the berries.

Because of High Commerce, Traders, are subjected to 26 species of substitution, a detailed botanical investigation with macro & microscopical comparison with the drug used under the name of VIDANGA.

Therefore the present study is an attempt to establish macro & Microscopic characteristic of E.R. as well as to Distinguish the species in Chart.

GJMR-B Classification : NLMC Code: QV 35

BOTANICAL STANDARDIZATION OF THE EMBELI RIBES BURMF POSSIBILITIES OF SPECIES SUBSTITUTE

Strictly as per the compliance and regulations of:

Botanical Standardization of the Embeli Ribes Burmf & Possibilities of Species Substitute

Syed Asadulla [α], Ramandang [σ] & Rajasekharan [ρ]

EmbeliaribesBURM. F. is an important drug of Ayurveda. Which is considered as multi remedies *with wide* group of Active consistents.Isolated from the berries.

Because of High Commerce, Traders, are subjected to 26 species of substitution, a detailed botanical investigation with macro & microscopical comparison with the drug used under the name of VIDANGA.

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I. Methodology

EmbeliaribesBURM. F. Fresh aerial twigs possessing flowers and fruits was collected from I.I.H.R. Hessarghatta fields, Bangalore with accession No.1001. which is an Altitute of 800 meters (2800Sqft) latitude : 13.1323 North, longitude: 77.49332 East. Wind at East 12KM/hr, Temperature (11^0-25^0C) Humidity at 45% which is washed thoroughly in running water and the samples were deposited in institutes respository vide voucher specimen numbers 1 to 5 of sample no. 1 (FRLHT Collection No. 55181), dated January 03, 2012, to study and identified the species by Dr. Ravikumar.K. Asst. Director, RMR Division, at Institute of Ayurveda &Integreative Medicine [IAIM], an initiative of FRLHT Herbarium division.andsome of the fresh material is preserved in FAA (Formalin-Acetic acid-Alcohol) and the rest was dried at room temperature and prepared Herbarium preserved, at Research Centre & rest was dried at room temperature for Histological studies,Berry Morphology at Fig.No.1.

a) The Drug indicates identification & authentication

Great emphasis is laid on the most diagnostic characters by which each parts of the plant was identified particularly with the macro biological group to which is belongs as in Table no.1, of fruit collection and genuine and substitution (Table no. 2) which gives the value in distinguishing features between species of fruits(berries).Table no. 3 are Rare Substitution.

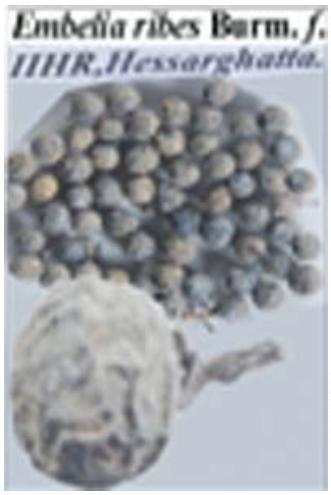

Figure 1 : (Berry)

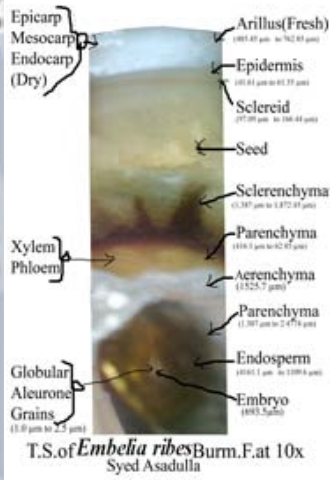

Figure 2 : (Fruit)

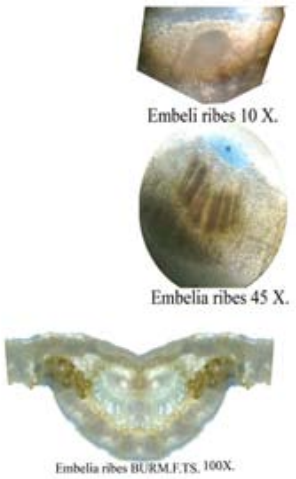

Figure 3 : (Leaf)

II. Macroscopy

MACROSCOPY of aerial portion collected with a twig with flowers & fruits. And diagnosing features are branchlets with many distinct tubercular projections leaves alternate, elliptic to oblong, base round, apex acute or shortly acuminate, papery, hairless, distinctly stalked, lateral nerves many, slender inconspicuous, with sunken glandular pits flanking lower side of the

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midrib, flowers, bisexual; minute about 2mm across, shortly stalked, white, mildly fragrant, arranged in axillary 7 terminal branched racemes, which are ca15 long. Fruit is a drupe, ca 5mm across, hairless, green with beaked apex (on ripening the fruit is dark black with distinct scaly and the details of leaf and fruit microscopy are as follows :-

III. Microscopy

Microscopy Authentic fresh leaves, fruits (berries) Fig.No.2, are collected from IIHR, B'lore, for the leaves Fig.No.3, and fruit Fig.No.2, as the Free – hand sections were taken of the aerial parts of the fresh plant to study the anatomical structure. Clearing and staining were done by the general methods.

As the leaf is first cleared in the solution of Chloral hydrate & lignification was established by the reaction with solution of phloroglucinol followed by a concentrated Hydrochloric acid (C-HCL) to detect the presence of lignin &also mounted for powder microscopy for fruit in dry condition.

The respective photographs were taken with nokiacamera and measurements were taken with camera lucida support and recorded.

IV. Anatomy

Stem - TS of fresh stem shows a circular outline, with a single layer of epidermis covered with a thin cuticle, numerous lenticels, Below the epidermis 2-5 rows of collenchymatous cortical tissue is present and rest of the cortex is parenchymatous containing numerous simple and occasionally oleoresin cells along with compound starch grains & patches of lignified fibers present at fairly regular intervals towards inner cortex, the vascular bundles, cambium, uniseriate medullary rays and pith is seen.

Petiole - TS of petiole is nearly circular in outline with a depression on the adaxial side, a thick wall epidermis, several well developed layers of collenchymas are present beneath the upper epidermis and a sheath of ground tissue, but only2 to 3 layers on Abaxial side.

Ground tissue is parenchymatous, vascular tissue forms an arc that has widely spaced bundles, a few small prismatic crystals of calcium oxalate are present in the ground tissue.

Midrib - TSFig.No.3, of leaf passing thorough the midrib shows a cuticularised upper glossy surface and lower epidermis and the midrib region shows a patch of collenchymatous cells in a depression below the upper epidermis with Prismatic crystals of calcium oxalate are present in the parenchymatous cells of the ground tissue six vascular spiral strands with thickness of 9μ to 18μ are present in the ground tissue of the midrib which is radially arranged xylem vessels intermittently phloem cells inFig.No.3.(Leaf)

Lamina - Cuticle present, upper epidermal cells in size ranges 95μ x 140 μ and the cells of the lower epidermis, ranges 120μ x 115μ in size two or three rows of palisade parenchyma cells are found below the upper epidermis with some rows of well-aerated spongy parenchyma & a few oleoresin globules are present and more numerous stomata on lower surface and with stomata on lower surfaces and matty ash grey colour with sunken glandular pits with moderate trichomes. In Fig No.4.

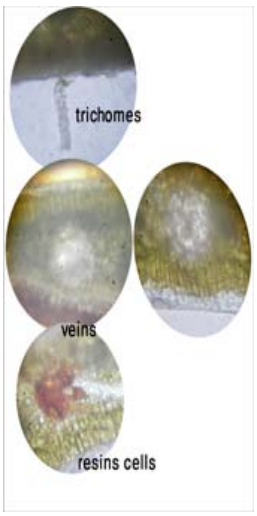

Figure 4

Fruits in fresh condition Fig.No.2.

1. In fresh condition the embryo consist of small thick parenchymatouscell and diameter size is 693.5μ with globular aleurone grains having a diameter 1.0 μ to 2.5 μ.
2. Endosperm consists of thick called parenchymatous cells layer thickness ranges from 4161.1 μ to 1109.6 μ with oil cells.
3. Perisperm:- Several layered thin walled parenchymatous cells layer thickness ranges from 208 μ to 1,248 μ along with starch grains.
4. Parenchymatous light Brown cells of lining of layer thickness ranges from 1.387 μ to 2.4774 μ.
5. Aerenchyma cells layer thickness ranges from 1525.7 μ.
6. Parenchyma 2 to 7 or several layers flattened cells layer thickness ranges from 416.1 μ to 62.85 μ with vascular bundles of xylem and phloem.
7. Sclerenchymatous dark Brown 10-14 layers which is projected intermittently radially arranged tapering ends of layer thickness ranges from 1,387 μ to 1,872.45 μ occipiedtapering ends in next abundant layers of inner parenchymatous Hexagonal cells.
8. On maturity fruits able to recognize seed structure attached with filaments and on seeds crushed in mixer show some of the somatic seeds ranges.

9. Sclereid layer of dark Brown of 2-3layers which is tangentially elongated layer thickness ranges from 97.09 μ to 166.44 μ.
10. Epidermis of 5 to 12 layers thick walled narrow and axially elongated cells layer thickness ranges from 41.61 μ to 61.35 μ.
11. In fresh condition Arilluslayer thickness ranges from 485.45 μ to 762.85 μ which is the layer of Testa is covered layer on the external side by thin transparent rectangular tangently arranged colourless cells or with collapsed parenchyma also called as membranous Arillus, In dry condition the Arillus is modified into Testa layer modified into rectangular scales 24 in number per fruit(Berries)which consist on T.S.ofepicarp, mesocarp and endocarp on powder analysis the testa region shows a group of oleoresin cells and stone cells.

V. Results and Discussions

HISTOLOGICAL Characteristics of leaf & fruit.Plays a crucial role in establishing the identity & determining the authenticity.

Detection of various anatomical features such as tracheids, trichromes, fibers, glands, cork, stomata, pollen grains etc provides important identification clues in leaf & fruits. ER and many of its species are recorded for their botanical characters in Table no.1 and 2.

EmbeliaribesBURM. F. botanical features deals with the pharmacognostical study of leaf and fruits.

VI. Discussions

EmbeliaribesBURM.F. plant character is identified in FRLHT,Bangalore, and soil samples is submitted in GKVK,Soil sciences ,, Bangalore. The results are awaiting and the Tissue culture study is carried out in I.I.H.R. Bangalore results are awaiting.

VII. Conclusion

The present statement is to predict the leaf & fruit characters of EmbeliaribesBURM. F.

Thus it is concluded that the above statement can be validated and authenticated on the basis of their macro &microscopical characters are the possibilities of substitutes.

Table 1 : Plants Seeds collected Morphological Diagnosis

Serial No.	Regions	Cortex Colour	Testa Fracture	Longitudinal Stiations or Scaly markings	Special Features
01	Hubli Hebsur	Ash Brown to green	Gradually Testais Erupted and few lines are seen.	22	Intermittent eruption in 30% of seeds
02	AyurHubli.	Brownish-Black with white patches	Testa is firmly attached	28	Few scaly eruption seen
03	Himalaya	Brown Green	Calyx, Broken, in 30%	24	Not to be seen
04	Kerala	Brownish Black	1% of Hemisphere Testa Breaks & 99% is safe	22	Nil
05	Rajastan	Brownish red to Green	Testa is erupted in 50% of seeds	22	4-5
06	Fathepur	Matte Ash – Brown	In half Hemisphere	Nil	Single Fracture
07	FRHLT	Reddish Brown	50% Testa is broken to powder	28 scales are found	Scaly depression
08	Hessarghatta	Reddish Brown to Green	Testa is attached to the seed	24 scales are found	Scaly depression
09	AmrutKesari	Brownish Black	Testa is erupted to 25%	24	2 to 3

Remarks - GenineVariety of IIHR.seeds are identified with Comparative Statement of cortex colour, Texta Fracture, Striations in the Longitudinal and Scaly Marking and Special features by which the IIHR & FRLHT Variety is genuine ,As per the Botanist Dr. Ravikumar item no 7 & 8 is E r Burm.f. and Item no 1,2,3,4,5,& 9 are embeliaTerijiumCottam and Item no 6 is not able to identify.

Table 2 : Published identified varieties

Sl. No.	Drug Name	Authour Name	Source	Uses	Published
01	EmbeliaribesBurm.f.	Chua,LSL; van Valkenburg,	JLCHForest Research Institute Malaysia, Jalan FRI, Kepong, 52109 Kuala Lumpur, Malaysia	Anthelmintic	Plant resources of South-East Asia No. 12(1): Medicinal and poisonous plants 1; de Padua, L.S., Bunyaprapatsara, N &Lemmens, R.H.M.J. (eds); Paperback edition; Bogor, PROSEA Foundation, 1999; p 257-258
01a	EmbeliaribuBurm.f.	Chua ngutVo Van Chi Tudien cay thuoc	Vietnam(grows in waste land, hill mountains)	ripped fruits Treat bitten by snack, earth worm, whites, cough and diarrhoea.	Vietnamese Medicinal Plants], Hanoi, Medicinal Publ. House, 1997; p. 244.
02	EmbeliarobustaRoxb.(Virganga. Birang-i-kabuli,)	Chua, LSL; van Valkenburg,	JLCHForest Research Institute Malaysia, Jalan FRI, Kepong, 52109 Kuala Lumpur,	berries cathartic	Plant resources of South-East Asia No. 12(1): Medicinal and poisonous plants 1; de Padua, L.S., Bunyaprapatsara, N &Lemmens, R.H.M.J. (eds); Paperback edition; Bogor, PROSEA

			Malaysia		Foundation, 1999; p 258
03	E. Basaal,	Roem&Schult	Indian	root as toothache, larger elliptical leaves, berries as forehead for pleuritis, young leaves gargle for sore throats	Trans.linn.soc.London.17:31,1834
04	Embelialacta	Tai nyuyen cay thuoc	mountains and hills	roots for treating cough and diarrhoea ,dried fruits for parasites, fever, skin-diseases;.	Sciencific and Technical Publishing House, 1993; p 221-226
05	Embelialaeta (L.) Mez	Chua nguthoatrang. Vo Van Chi Tudien cay thuoc	Vietnam	Acne Care Products	Vietnamese Medicinal Plants], Hanoi, Medicinal Publ. House, 1997; p. 245-246.
06	Embelialacta (L.) Mez. (Day)	Nguthoatrang Le QuyNguu; Tran NhuDuc Cay thuocquanh ta and Chua ngut Le Tran Duc Tronghaiva dung cay thuoc	Himalaya hills of China.	Anthelmintic.	[Popular Medicinal Plants] Hue - ThuanHoa Publishing House: 284-285 (1998) and[Planting, harvesting and usin medicinal plants] Vol. 1: 160- 170. Agr. Publishing House. Hanoi, 1984.
07	Embeliagarciniifolia),	Nguyen Dang Knoi	Vietnam	treating dysentery	National Scientific Research Centre of Vietnam Tap chi Duoc hoc [Journal of Pharmacy] (4): 11-13 (1977)
08	Embeliapicta A. DC.	Chua ngutdom Vo Van Chi Tudien cay thuoc	Vietnam	Anthelmintic.	Vietnamese Medicinal Plants], Hanoi, Medicinal Publ. House, 1997; p. 245.
09	Embeliaphilippinensis A. DC.	Rhamnuslando, Ribesoidesphilippense, Samara philippinensis), Jansen, PCM Prosea	philippinensis	Anthelmintic	Department of Plant Sciences, Wageningen Agricultural University, P.O. Box 341, 6700 AH Wageningen, Netherlands Plant resources of South-East Asia No. 13: Spices; de Guzman, C.C. &Siemonsma, J.S. (eds); Paperback edition; Bogor, PROSEA Foundation, 1999; p 253
10	EmbeliaTsjeriam Cottam.	Chua, LSL; van Valkenburg, JLCH	Malaysia	Anthelmintic	Forest Research Institute Malaysia, Jalan FRI, Kepong, 52109 Kuala Lumpur, Malaysia.

Remarks - The above nine varieties are identified and Published but the seeds are very similar in morphology to EmbeliaribesBURM.f.

Table 3 : Rare Substiuents are

Serial no	Drug name
01	Embelia Arunachal,
02	EmbeliaAustraliana
03	EmbeliaChatisghar
04	EmbeliaDasytania
05	Embeliadisticha Fletcher
06	Embeliaferruginea Wall
07	Embeliagrandifolia Fletcher
08	Embelia Gulf
09	Embelia Herbal King
10	Embelia homeopathy
11	Embelialongifolia (Benth.) Hemsl
12	Embeliamacrocarpa King & Gamble
13	Embelia Malabar
14	EmbeliaMalasian
15	EmbeliaoblongifoliaHemsl
16	EmbeliaPaciflora
17	EmbeliaParviflora
18	EmbeliapulchellaMez
19	EmbeliasessilifloraKurz
20	EmbeliastrictaCraib
21	EmbeliaVaividangam
22	Embeliavillosa Wall

Remarks - The above Twenty two varieties are identified but not published but the seeds are very similar in morphology to EmbeliaribesBURM.f.