

PHARMACOGNOSTICAL INVESTIGATIONS ON *TRIPHALA CHURNAM*

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ABSTRACT :

Pharmacognostical and preliminary phytochemical studies of *Triphala churnam* were carried out. The churnam of triphala consists of equal quantities of deseeded fruits of *Terminalia chebula*, *Terminalia bellerica* and *Emblica officinalis*. *Triphala* is exclusively used in more than 200 drug formulations in Indian system of Medicine. The present study involved the pharmacognostical evaluation of *Triphala*, in which morphological and powder microscopical characters were established. In addition, physico-chemical parameters such as ash values viz, total ash (10.21 ± 0.42), acid insoluble ash (2.54 ± 0.06), water-soluble ash (5.46 ± 0.24) and sulphated ash (13.12 ± 0.63), extractive values viz, alcohol soluble extractive (11.20 ± 0.18) and water-soluble extractive (52.56 ± 2.04), fluorescent analysis and microchemical tests were determined. The preliminary phytochemical study revealed the presence of carbohydrates, reducing sugar and tannins in aqueous extract and carbohydrates, flavonoids and tannins in alcoholic extract. This standardization would be very much helpful for the identification of *Triphala churnam* to differentiate from other powdered sources.

INTRODUCTION

Triphala churnam consists of dried fruits of *Terminalia chebula* Retz (Combretaceae) distributed throughout the greater part of India, Burma and Srilanka up to 5000ft in outer Himalayas and up to 6000ft in western ghats, dried fruits of *Terminalia bellerica* Roxb (Combretaceae) distributed throughout the forest of India, Burma and Srilanka, below elevation of about 3000ft except in dry region of Sind and Rajasthan, dried fruits of *Emblica officinalis* Linn

(Euphorbiaceae) distributed throughout the greater part of India and Srilanka especially in Deccan plateau, coastal districts of India and also in Kashmir. The *Triphala churnam* is found to be an effective astringent and used in diarrhoea, dysentery and extensively used as additive in systemic treatments of diabetes, spasm, scurvy, jaundice, dyspepsia, cough etc. The churnam is exclusively used in multiple drug formulations in Indian system of medicine.

Review of earlier literature

showed that, fruit of *Terminalia bellerica* is astringent, digestive, laxative, anthelmintic, useful in bronchitis, asthma, diseases of the eye, diarrhoea. The fruit of *Terminalia chebula* is stomachic, expectorant, anthelmintic, useful in sore throat, asthma, diseases of the heart and eyes, as an antitumour, in dyspnoea, constipation, elephantiasis and paralysis. The fruit of *Emblica officinalis* is diuretic,

carminative, stomachic, tonic to brain and used in diarrhoea^{1&2}. 3,4,5, Trihydroxy benzoic acid (Gallic acid) obtained from *Terminalia bellerica* confirms the presence of hepatoprotective activity³. Fresh juice of *Emblica officinalis* has been found to be as effective hypolipidemic and can be used as a pharmaceutical tool in hyperlipidaemic subjects⁴.

Vernacular names^{5&6}

Language	<i>Terminalia chebula</i>	<i>Terminalia bellerica</i>	<i>Emblica officinalis</i>
English	Chebulic myrobalan	Beleric myrobalan	Emblica myrobalan
Tamil	Kadukkai	Tandrikkai	Nellikai
Hindi	Harara	Bahera	Amla
Sanskrit	Haritaki	Bibhitaki	Amalaki
Telugu	Karikaki	Tadi	Amlakamu
Bengali	Haritaki	Bohera	Amlaki

MATERIALS AND METHODS

The fruits of the three plants were collected from the local areas in and around Kanchipuram district, Tamilnadu. The fruits were identified and authenticated by Botanist, Captain Srinivasamoorthy Research and Ayurveda, Arumbakkam, Chennai. The collected fruits were shade dried and reduced to a coarse powder in a mechanical grinder. The equal quantity of powdered material was extracted with 90% alcohol and water in soxhlet apparatus. The individual extracts were collected and concentrated by evaporation.

Morphology

Fruits of *Terminalia chebula* are brown in colour, ovoid in shape, size 20-35 mm length, 13-25 mm width, surface-wrinkled longitudinally, hard and strong, odorless, astringent in taste and slightly sweetish. Fruit of *Terminalia bellerica* are drupe, grey and velvety, ovoid in shape, size 2-5 cm in length, 1-2.5 cm in width, odorless acid and has an astringent taste. Fruits of *Emblica officinalis* are drupe, pale green to yellow in colour, pink when ripe, glabrous in shape, spherical, 6 grooved, size 1.3 – 1.6 cm in diameter, has fleshy and edible mesocarp and stony endocarp, is odorless with pleasantly sour taste.

Triphala churnam is fine powder, brown, greenish brown in colour, and has no characteristic odour, but has acrid and slightly sour taste.

Powder microscopy⁷

Triphala churnam shows,

1. Lignified phloem fibres
2. Unicellular and multicellular covering trichomes
3. Lignified epidermal cells
4. Numerous unstained parenchymatous cells
5. Brownish oil globules

Qualitative phytochemical analysis⁸

The alcoholic and aqueous extracts of triphala were subjected to qualitative tests for the phytochemical identification of various plant constituents with different chemical reagent.

Physico-chemical parameters⁹

Physico-chemical parameters such as ash values (total ash, acid insoluble ash, water-soluble ash and sulphated ash) and extractive values were determined. Triphala churnam was treated with different chemical reagents and observed under daylight and UV light to observe their fluorescent properties and similarly observe under microscope to check the changes of colour.

RESULTS AND DISCUSSION

The macroscopical characters of Triphala fruits viz. Terminalia bellerica, Terminalia chebula, Emblica officinalis

were carried out. The powder microscopical characters of triphala churnam were reported. Physico-chemical parameters like ash values viz. total ash (10.21 ± 0.42), acid insoluble ash (2.54 ± 0.06), water-soluble ash (5.46 ± 0.24) and sulphated ash (13.12 ± 0.63) and the extractive values viz. water soluble extractive (52.56 ± 2.04) and alcohol soluble extractive (11.20 ± 0.18) were recorded.

The result of preliminary phytochemical screening shows the presence of carbohydrates, reducing sugar and tannins in aqueous extract and carbohydrates, flavonoids and tannins in alcoholic extract (Table 1). The astringent effect of triphala churnam may be due to presence of tannin in both aqueous and alcoholic extract, which is confirmed by various phytochemical tests and is present in all the three plants. Traces of fixed oil was also found in the alcoholic extract of triphala churnam. Fluorescence analyses of powdered drug (Table no.2) and micro chemical tests with different reagents (Table No.3) were carried out.

CONCLUSION

This investigation is very much helpful for the identification of triphala churnam, which would be useful in the field of pharmacognosy, phyto chemistry, botany and herbal industry for further research activities.

**Table 1. Phytochemical analysis of
*Triphala churnam***

S.No	Phytochemical Constituents	Alcoholic extract	Aqueous extract
1	Carbohydrates	+	+
2	Reducing sugars	-	+
3	Glycosides	-	-
4	Proteins	-	-
5	Saponins	-	-
6	Alkaloids	-	-
7	Phytosterols	-	-
8	Tannins	+	+
9	Flavonoids	+	-
10	Fixed oils and fats	+	-

+ = Present - = absent

**Table 2. Data showing the fluorescence analysis
of *Triphala churnam***

Solvent	Daylight	UV Light Color Obtained
Hexane	Greenish yellow	Fluorescent green
Chloroform	Fluorescent green	Green
Alcohol	Fluorescent green	Yellowish green
Water	Light brown	Fluorescent green
Acetone	Light green	Greenish yellow

Table 3. Data showing the microchemical analysis of *Triphala churnam*

S.No	Acid/Chemicals	Observations
1	Powder as such	Dark green
2	Aqueous 10% NaOH	Light brown
3	Ammonia solution	Light yellow
4	Iodine solution	Light brown
5.	Ferric chloride	Black
6	Conc.HNO ₃	Light brown
7	Conc.H ₂ SO ₄	Reddish brown
8	Conc.HCl	Yellowish brown
9	Acetic acid	Light green
10	Picric acid	Light yellow

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