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**ESTIMATION OF TANNIN CONTENT IN SOME MARKETED HARDE
CHURNA (TERMINALIA CHEBULA RETZ. FAMILY- COMBRETACEAE)**

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Abstract:

Terminalia chebula Retz. family- Combretaceae (Harde) churna prepared from different grades are available in market, which shows wide variation in tannin content and quality. Therefore in the present study an attempt has been made to determine the tannin content of different grades of churna of different manufacturer. Twelve commercial samples includes three different grades of four manufacturer were collected from local market of Nashik. Alcoholic extracts of churnas were subjected for tannin estimation by UV/Vis spectrophotometer using Folin-ciocalteau reaction. The tannin content variation found in extracts of different varieties as Rangari, Bal, and Surwary Harda for mfg. **A** found as 6.25, 32.43, 23.20 (%w/w), for mfg. **B** is found as 23.43, 37.73, 23.40 (%w/w), for mfg. **C** found as 11.52, 30.09, 32.50 (%w/w) and from mfg. **D** found as 24.00, 39.52, 24.19 (%w/w) respectively. The *tannin percentage range* in Bal variety is found more as about 30-40%w/w, in Surwary as about 20-25% w/w and in Rangari as about 5-25%w/w. Also variation found depending upon the manufacturer. Wild source shows presence of 25-40 % of hydrolysable tannin.

Key words: Terminalia chebula, Tannins, Rangari Harda, Bal Harda, Surwary Harda and Haritaki

Introduction:^{1,2}

Terminalia chebula Retz. family- Combretaceae, commonly known as myrobalan in English, Haritaki in Sanskrit and Bal Har in Hindi. It is widely distributed in India, Malaysia and south to Shrilanka.¹

Myrobalan tree has 15to25 m height and 1.5-2.5 m diameter of trunk .It is rounded, crowned with spreading branches and oxalate leaves with yellowish white flowers in the terminal spike. Colour of fruit is yellowish – brown ,odourless ,taste- astringent, slightly bitter and sweetish at the end.The fruits ripen from November to March, and falls on the ground.In trade Harda is divided into three categories **Rangari Harda**-these are smaller, less wrinkled and less furrowed than the other varieties, one inch long, the epidermis is yellow. These are generally used in tanneries and for preparation of colours hence name as a rangari. Second is **Bal Harda**-these are much smaller than the other two varieties, colour is deep brown or black highly wrinkled. Their pulp is dark and homogenous with absence of stone.The fruit of it is collected before maturity as has more medicinal value. When it becomes mature, it loses medicinal value thereby fetching less money. However harvesting at such an early stage is not considered sustainable. Forest dwellers are forced to do it as it fetches more prices. Third is **Surwary Harda**- these are large, dense and heavy about 2 inches long yellowish brown.

There are two varieties such as *T. chebula* var. *chebula* ,in which Leaves and shoots hairless, or only hairy when very young and *T. chebula* var. *tomentella* (Kurz) in which Leaves and shoots silvery to orange hairy.

The dried flesh surrounding the seed is rich in astringent principle called tannin (25-32%)^{1,12,13} which considerably varies with different grade of it from different areas.The fruits collected from Madras are very rich in tannin The tannin of Myrobalan belong to the pyrogallol type which being a hydrolysable type material, it finds limited use in leather tanning industry^(3,4,5)

Fruit is mild laxative, stomachic, tonic, adaptogen, antispasmodic, hepatoprotective, antiasthmatic, antiviral and hypoglycemic .It's churna generally used in Ayurveda for various ailments. in chronic diaorrhea, to increase the appetite, as digestive aid, Liver stimulant, as stomachic, as gastrointestinal prokinetic agent, mild

laxative chronic cough, coryza, sore throat and asthma.

It has proven gastro kinetic effect, good nervine tonic, in nervous weakness. If we review all the herbal formulations in Ayurveda's all classical texts, we will find haritaki to be one of the most frequently used ayurvedic herbs. The author of *Bhava Prakash* in his Materia Medica relates haritaki to be used with sugar in Pitta disorders, with salt in Vata disorders, with dried ginger in Kapha disorders.^(7,8)

It is used in blends with other tanning materials, not suitable as a self-tanning material. It is used in the final stages of tanning for topping for improving the light fastness.

The main objective of this topic is to determine the tannin content variation of varieties by Folin-Ciocalteu reaction.

Materials and Methods:

The twelve commercial samples of Harde churna of three varieties collected from local market of Nashik of four manufacturers. They are labeled manufacturer A, B, C and D.

Chemicals :

Gallic acid , Sodium Carbonate, Folin Ciocaltea reagent (Research Lab, Qualigen Fine Chemicals)

Equipment:

UV –visible spectrophotometer (Chemito spectrascan Version-U.V.2700)

Sample preparation

1 gm of churna samples of each variety were subjected for extraction by hydroalcoholic maceration with intermittent shaking. After every 8 days the supernatant liquid is removed with addition of fresh solvent in bottle for maceration. The process is continued for about 21 days, with change of solvent. At the end collected supernatant were mixed as per variety and concentrated to dryness, extractive values were determined . Dried extracts were diluted to make 100 ppm solution , from which 1ml is subjected for estimation.

Determination of tannins contents

The determination of total tannins content was carried out by using **Folin-ciocalteu method**. 1 ml of standard gallic acid solution (10-100 ppm) or 1ml of alcoholic extracts of drugs(100 ppm) were mixed with 1ml of Folin-ciocalteu reagent and 4ml of (7.5%w/v) sodium carbonate. The absorption was read after 30 min. at 20⁰c at 740nm and calibration curve was drawn. All readings were taken against reagent blank.

Result and Discussion:

The tannin content variation found in extracts of different varieties as Rangari, Bal, and Surwary Harda for mfg. **A** found as 6.25,32.43, 23.20 (%w/w), for mfg. **B** is found as 23.43, 37.73, 23.40 (%w/w), for mfg. **C** found as 11.52, 30.09, 32.50 (%w/w)and from mfg.**D** found as 24.00, 39.52, 24.19 (%w/w) respectively. The *tannin percentage range* in Bal variety is found more as about 30-40% w/w, in Surwary as about 20-25% w/w and in Rangari as about 5-25% w/w. Also variation found depending upon the manufacturer .Wild source shows presence of 25-40 % of hydrolysable tannin.

Figure-1: Standard absorbance curve of gallic acid

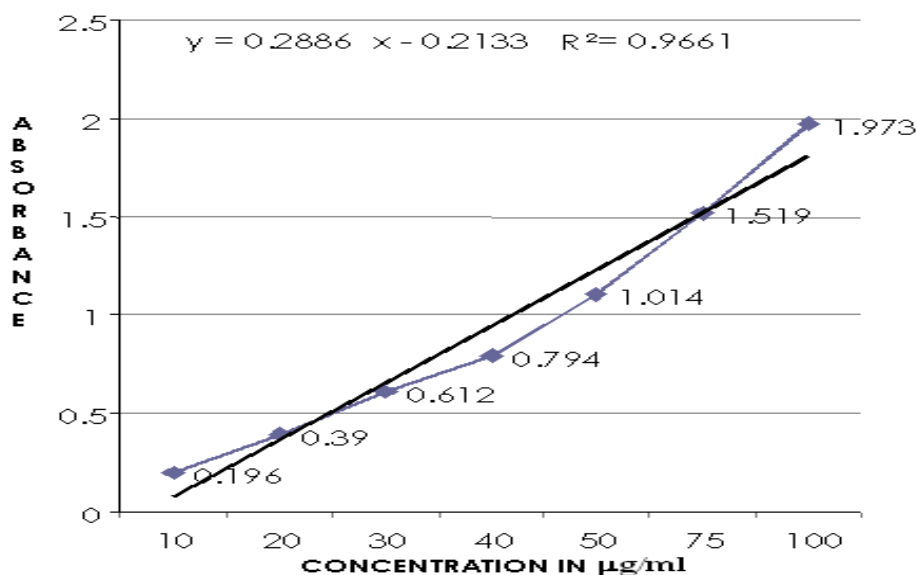
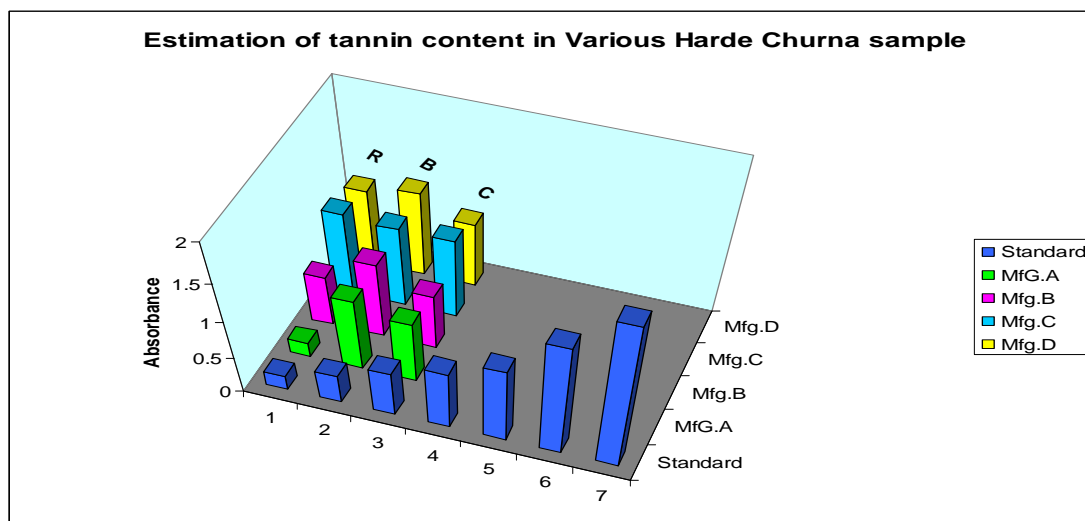


Figure-2: Estimation of tannins content in various churna sample



R= RANGARI, B= BAL,S= S URWARY
HARDE CHURNA

Table no-1: Terminalia chebula churna extracts Physico properties grade wise.

| Manufacturers | Churna variety | Color of churna | Extractive value | Color of Extract |
|-----------------|----------------|-----------------|------------------|------------------|
| Manufacturers-A | RANGARI | Light green | 62% w/w | Reddish brown |
| | BAL | Brown | 69% w/w | Light brown |
| | SURWARY | Yellowish brown | 58 % w/w | Yellowish brown |
| Manufacturers-B | RANGARI | Light green | 71 % w/w | Brown |
| | BAL | Brown | 77% w/w | Yellowish brown |
| | SURWARY | Brown | 65 % w/w | Dark brown |
| Manufacturers-C | RANGARI | Yellow | 36 % w/w | Yellow |
| | BAL | Brown | 59 % w/w | Brown |
| | SURWARY | Brown | 65% w/w | Yellowish brown |
| Manufacturers-D | RANGARI | Green | 60 % w/w | Dark brown |
| | BAL | Yellowish brown | 76 % w/w | Brown |
| | SURWARY | Light green | 59 % w/w | Yellowish brown |

Table no-2: Standard Gallic acid absorbance.

| Std. | S1 | S2 | S3 | S4 | S5 | S6 | S7 |
|-------------------------|------------------|------------------|------------------|------------------|------------------|----------------|------------------|
| Mean absorbance ±S.D | 0.196 ±0.0240 | 0.390 ±0.0140 | 0.612 ±0.0123 | 0.794 ±0.0133 | 1.014 ±0.0086 | 1.519 ±0.04 | 1.973 ±0.0087 |

Table no-3: Terminalia chebula churnas absorbance under Folin Ciocalteu method. Analysis period (2008-09).

| Manufacturers | Churna variety | Absorbance | | | Mean absorbance±S.D. |
|-----------------|----------------|------------|-------|-------|----------------------|
| | | 1 | 2 | 3 | |
| Manufacturers-A | RANGARI | 0.188 | 0.190 | 0.188 | 0.188± 0.002 |
| | BAL | 1.00 | 0.937 | 0.920 | 0.952±0.029 |
| | SURWARY | 0.835 | 0.807 | 0.780 | 0.807± 0.0240 |
| Manufacturers-B | RANGARI | 0.669 | 0.686 | 0.628 | 0.661±0.017 |
| | BAL | 1.061 | 0.932 | 0.984 | 0.992± 0.0421 |
| | SURWARY | 0.713 | 0.733 | 0.728 | 0.724± 0.06 |
| Manufacturers-C | RANGARI | 1.096 | 1.068 | 1.050 | 1.071±- 0.014 |
| | BAL | 1.046 | 1.037 | 1.017 | 1.033±0.0210 |
| | SURWARY | 1.064 | 1.074 | 0.946 | 1.028±0.0275 |
| Manufacturers-D | RANGARI | 0.990 | 0.973 | 0.956 | 0.973±0.01044 |
| | BAL | 1.109 | 1.073 | 1.072 | 1.084± 0.07118 |
| | SURWARY | 0.829 | 0.829 | 0.825 | 0.827±0.00244 |

Where S.D.= Standard deviation (where n=3)

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