

Original Research Article

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**AN EVALUATION OF WET AND DRY DOSAGE FORMS OF *VITEX NEGUNDO* LINN (*NIRGUNDI*) LEAVES WITH THE HELP OF EXTRACTIVE VALUES W.S.R. TO *SHARANGDHAR SAMHITA***

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**Abstract:**

*Nirgundi (Vitex negundo Linn.)* is a hardy plant, which has enormous traditional uses against various diseases. Pharmacological properties of the plant drug depend on their phytochemical constitution. According to *Sharangadharacharya*, *Ardra* (wet) *Dravya* should be always used twice in quantity as compared to *Shushka* (Dry) *Dravya*. Considering this fact present study was planned to evaluate the wet and dry dosage forms of *Vitex negundo* Linn. (*Nirgundi*) leaves with the help of their extractive values with special reference to *Sharangdhar Samhita*. *Ardra* and *Shushka* dosage forms of *Nirgundi* leaves were prepared using fresh leaves *Kalka* for *Ardra* dosage form and powder of dried leaves for *Shushka* form. Extractive values were performed in multiple solvents like ethanol, petroleum ether, chloroform, aqueous and traditional *Kwatha*. Extractive values of *Nirgundi* leaves were found four times higher in ethanol, petroleum ether, chloroform and aqueous extract of dry dosage form than wet/fresh dosage form. This confirms compositional difference and effect of drying in selected dosage of form of *Nirgundi* leaves.

**Key Words:** *Nirgundi, Ardra, Shushka, Vitex negundo, Kwatha*

## Introduction

Pharmacological properties of the plant drug are based on the different phytochemical constituents present within these plants and these phytochemical constituents produce definite physiological or pharmacological action on the human body. The chemical composition of the plant drug is dependent on species identity and maturity of plant, harvest time, collection time, altitude, climatic condition, storage conditions and processing [1-3]. The processing and storage may cause changes in the phytochemical of compounds. Ayurveda has considered all these factors since ancient times and accordingly formularies has been established which are based on some basic principles for the treatment as well as formulation of medicine [3-5].

*Nirgundi* (**Figure 1**) is a well-known Ayurvedic medication belongs from family *Verbenaceae* that has analgesic, anti-inflammatory and anti-arthritic properties. The combination of *Tikta Rasa*, *Laghu Guna*, *Katu Vipaka* and *Ushna Virya* pacifies *Vata* and *Kapha Doshas*. Traditionally, it's *Shothahara*, *Vedanasthapana* and *Jvaraghna* properties have been used to treat ailments like *Sandhigata Vata* and *Jvara*. Flavonoids, terpenoids and alkaloids are responsible for its antibacterial, neuro-protective, hepato-protective and anti-inflammatory properties. *Nirgundi* is also available in the form of classical formulations such as *Taila*, *Kwatha* and *Churna*, etc [6, 7].



**Figure 1: Plant of Nirgundi**

Ayurvedic formulary such as *Sharangdhar Samhita* in which *Sharangadharacharya* has described to use *Shushkadravya* (dry drug) which is freshly collected from plant source and dried. Similarly, when there is reference of *Ardra Dravya* always use freshly collected samples from plant source and it is also stated to use *Ardradravya* twice in quantity to that

of *Shushkadravya* [8-10]. Therefore a study was planned to understand this concept to evaluate the difference in physicochemical properties in *Ardra* and *Shushkadravya* with the help of Extractive value [11, 12].

### **Aim and Objective:**

- ✓ To evaluate Wet and Dry Dosage Forms of *Vitex negundo* Linn (*Nirgundi*) leaves with the help of extractive values with special reference to *Sharangdhar Samhita*.

### **Materials & Methods:**

Samples of *Nirgundi* leaves were self-collected from herbal garden of Dr. G.D. Pol Foundations YMT Ayurvedic Medical College, Kharghar, India. The plants were botanically identified and authenticated by *Dravyaguan* Dept. of institute and it was confirmed as *Vitex negundo* Linn.

### **Place of work:**

Central Research Laboratory, Dr. G. D. Pol Foundations YMT Ayurvedic Medical College, Kharghar, India.

### **Preparation of study drug samples for physicochemical study**

*Ardra* and *Shushka* dosage forms of *Nirgundi* leaves were prepared as follows:

#### **1. Fresh leaves Kushta (*Ardra* form):**

The plant samples (Leaves of *Vitex negundo* Linn) free from any pest, disease or decay were collected, cleaned and then crushed to paste like form.

#### **2. Powder of dried leaves (*Shushka* form):**

Fresh leave of *Nirgundi* were collected and dried under a shade and was grinded to prepare *Churna*.

Extractive values were determined in multiple solvents, including ethanol, petroleum ether, chloroform, aqueous extract and traditional *Kwatha*.

### **Methodology for physicochemical studies (Determination of extractives value)**

Ethanol extract (5%) of the dry and fresh dosage form *Nirgundi* leaves was prepared in magnetic stirrer machine by shaking for six hours and standing for 18 hrs. The extract was

filtered in previously weighed empty petri dish and was allowed to evaporate till complete drying and weight taken. The difference in weight and the percentage was calculated. Same procedure applied to other solvents like petroleum ether, chloroform, aqueous extract and traditional *Kwatha* of dry and fresh dosage forms.

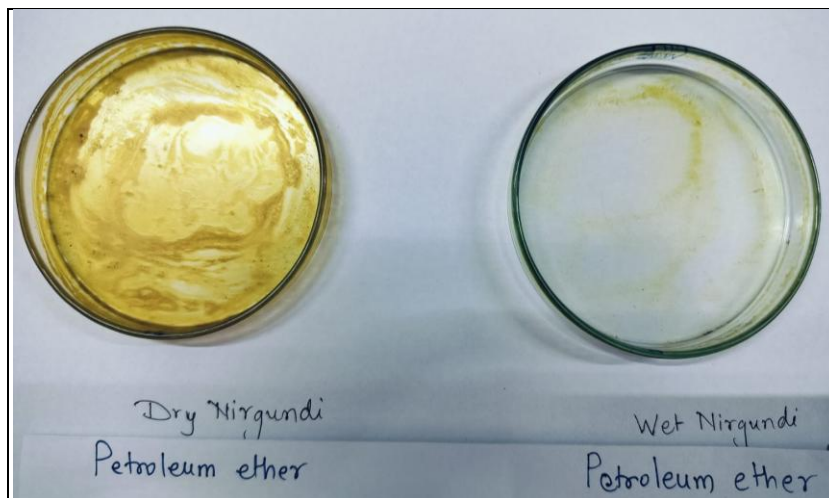
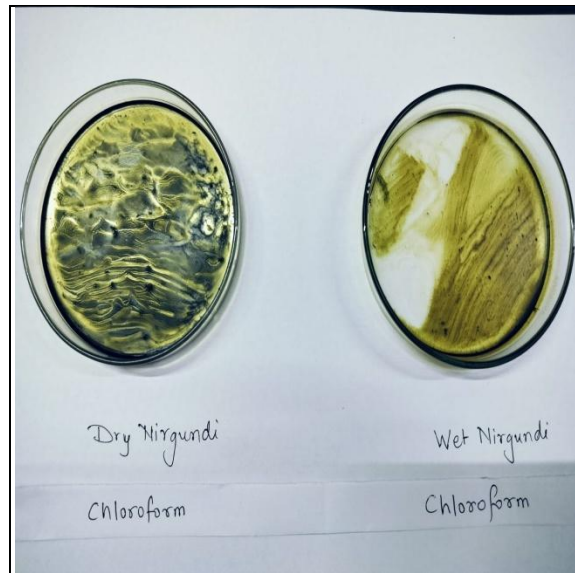
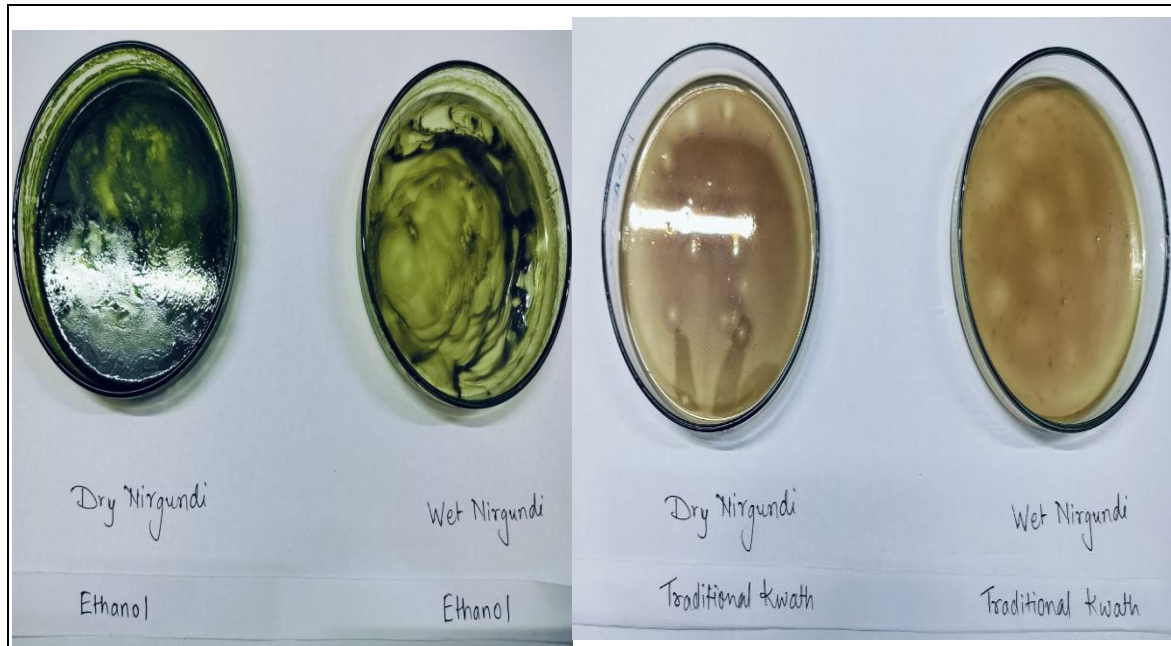
### Observation and Results:

The extractive content of *Vitex negundo* leaves were found to be different based on the solvent (**Table 1**).

**Table 1: Extractive Values of Different Forms of *Nirgundi* Leaves**

Sr. No.	Type of Solvent	Extractive Value of Different Extracts	
		Dry Form of <i>Nirgundi</i> leaves	Wet Form of of <i>Nirgundi</i> leaves
1.	Ethanol	17.4	6.48
2.	Petroleum ether	5.04	1.36
3.	Chloroform	8.64	2.88
4.	Aqueous	20.6	3.68
5.	Traditional <i>Kwatha</i>	16.64	8.96

Aqueous solvent yielded the highest percentage in dry leaves (20.6%), followed by ethanol (17.4%) and conventional *Kwatha* (16.64%). Chloroform and petroleum ether had lower extractive values of 8.64% and 5.04%, respectively. For the wet leaves, the highest extractive value was obtained using the traditional *Kwatha* method at 8.96% and the extraction with ethanol gave 6.48%. Aqueous extraction gave a moderate yield of 3.68%, while chloroform and petroleum ether had the lowest extractive values at 2.88% and 1.36%, respectively. From this data, it can be concluded that the efficiency of extraction depends a great deal on both the solvent used and the moisture content of the leaves. Images of different extracts are depicted in **Figures 2-6**.



**Figures 2-6: Images of different extracts of plant leaves**

**Discussion:**

*Sharangadharacharya* had described that in the drug formulation, *Shushka* form should be taken in single quantity while using the fresh drug or during the unavailability of the fresh drug, the green fresh plant drug should be taken twice in quantity to that of dry drug as the dry drug is *Guru* and *Tikshna* due to the lack of moisture and less concentration of chemical constituents. This rule is applicable to all the drugs except few enlisted exceptions.

Two different dosage forms of *Nirgundi* leave i.e. *Ardra* and *Shushka* dosage forms were prepared; these were analyzed by extractive value tests. *Ardra* forms were prepared as a *Kalka* of *Nirgundi* leaves and *Shushka* forms were prepared as a *Churna* of dried *Nirgundi* leaves. The concentration of this constituent might be more in the dried state than in fresh form. Extractive values of *Ardra* & *Shushka* *Nirgundi* leaves were evaluated. Ethanol extractive value was found to be 17.4 % for *Shushka* sample and 6.48 for *Ardra* sample. The other extractives such as petroleum ether soluble extractive value, chloroform soluble extractive value, aqueous and *Kwath* extractive value were also evaluated. In the test like extractive values of *Nirgundi* leaves, values were found three times higher in ethanol, five times higher in petroleum ether, four times higher in chloroform and six times higher in aqueous extract of dry dosage form than fresh dosage form. Extractive value of *Nirgundi* leaves was found be double in the dry dosage form (16.64) than fresh dosage form (8.96) of traditional *Kwatha*.

**Limitations/Recommendations:**

Aqueous and traditional *Kwatha* extracts were difficult to restore for longer duration.

**Conclusion**

In extractive value tests of *Nirgundi* leaves, values were found to be four times higher in ethanol, petroleum ether, chloroform and aqueous extracts of the dry dosage form compared to the fresh dosage form. Additionally, the extractive value of *Nirgundi* leaves in traditional *Kwatha* was found to be double in the dry dosage form compared to the fresh dosage form. From the above observation of extractive values, we can conclude to use *Ardra Dravya* twice in quantity to that of *Shushka Dravya* as mentioned in *Shargadhar Samhita*.

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