

## UV – VIS. SPECTROSCOPIC STUDY ON PHYTOCONSTITUENTS OF AMALAKYADI GANA (COMPOUND FORMULATION)

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### ABSTRACT

A variety of techniques can be used to determine and estimate the presences of phyto-constituents in medicinal plants. Spectroscopic methods have been firmly established as a key technological platform to identify and to characterize the biomolecules presents in medicinal plants. The phyto-constituents always resemble their fingerprints (unique signature) under spectroscopic characterizations viz. UV-Vis, Photoluminescence, FT-IR and Raman studies. Thus, the present study is focused to understand the UV-Vis characteristics of Amalakyadi Gana as well as to identify the contained phyto-constituents. Among the spectroscopic techniques, ultraviolet-visible spectroscopy (UV-Vis)

has become the most important analytical instrument in the modern day laboratory. It refers to absorption or reflectance spectroscopy.

**KEYWORD:** Phyto-Constituents, UV-Vis, Amalakyadi Gana, Spectroscopic Techniques.

### INTRODUCTION

There are good number of single and compound dosage forms are prescribed for different kinds of Jvara in original text of Ayurveda but there is one compound formulation found in Sushruta Samhita 38<sup>th</sup> chapter of Sutra Sthana, which is said as Sarva Jvarahara (to alleviate all kind of fever). It is also said Cakshushya (Beneficial to eye), Dipana (enhances the Agni), Vrishya (Aphrodisiac) and Kapharocakan (Eversion of food due to Kapha). In this chapter the Gana (group) is named as Amlakyadi Gana, which consists of Amalaki, Haritaki, Pippali and Citraka.<sup>[1]</sup> All the four drugs of this group are vegetable in origin. The fruit of Amalaki, Haritaki and Pippali and the root of Citraka are the ingredients of this gana. Haritaki

(*Terminalia Chebula* Retz.), Amalaki (*Emblica Officinalis* Gaertn.), Pippali (*Piper Longum* Linn), Citraka (*Plumbagozeylanica* Linn.) is well known plant in Ayurveda.



1. Amalaki.



2. Dry Fruit of Amalaki.



3. Haritaki.



4. Dry fruit of Haritaki.



7. Citraka.



8. Dry root of Citraka.



5. Pippali.



6. Dry fruit of Pippali.

**Fig. 1: Drug of Amalakyadigana.**

UV-Vis spectrophotometer is related to the spectroscopy of photons in the UV-visible region. UV-visible spectroscopy uses electromagnetic radiation in the visible ranges or its adjacent ranges. The color of the chemical(s) directly affects the absorption in the visible ranges. Molecules undergo electronic transitions in these ranges of the electromagnetic spectrum.<sup>[2,3,4]</sup> UV-Vis spectroscopic studies help in identification and authentication of the

phyto-constituents of medicinal plants. This information may be act as reference for correct knowledge and also help as a tool to detect adulteration of that particular medicinal plant. In the present investigations, the Hydroalcoholic extract of Amalakyadi Gana was subjected to phytochemical screening by using UV-Vis spectroscopic technique to identify phytoconstituents.

## MATERIAL AND METHOD

**Plant material:** Haritaki (*Terminalia Chebula* Retz.), Amalaki (*Embllica Officinalis* Gaertn.), Pippali (*Piper Longum* Linn), Citraka (*Plumbagozeylanica* Linn.) has been identified by Prof. V.K. Joshi, Department of Dravyaguna, B.H.U. The fruit of Amalaki, Haritaki and Pippali was taken and root of Citraka was taken. The mature fruit of Amalaki and Haritaki was collected from the Ayurvedic Dravyaguna garden, B.H.U. Varanasi, Citraka root was collected from the Rajiva Gandhi south Campus Barkacha, Mirzapur. The fruit of Pippali was taken from the local crude drug market Goladinanath after ensuring that the drug is more than 1 year old. Sample of collected drug were kept in the museum of the department of Dravyaguna faculty of Ayurveda IMS, BHU Varanasi as with Voucher specimen no- **DG/17/136, DG/17/137/, DG/17/138, DG/17/139.**

### Preparation of extract

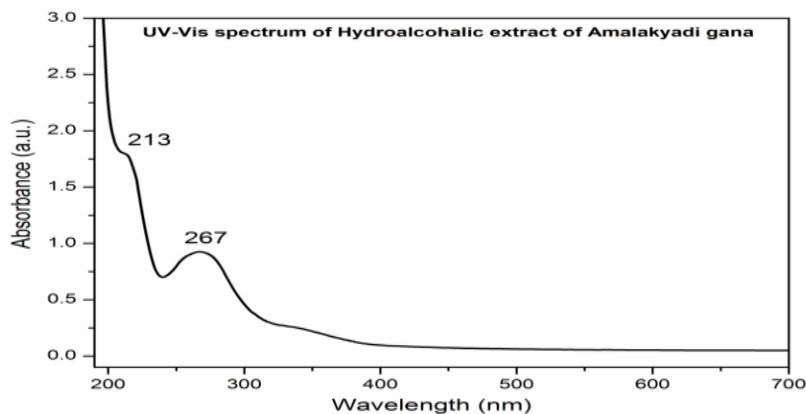
The coarse powdered was extracted in a Soxhlet apparatus for 7 days. 100 g of coarsely powdered of each of air-dried material was accurately weighed and placed in a glass-stoppered conical flask. Powder was then macerated with 400 ml of the solvent (Water/ethanol) concerned for 6 hours, shaking frequently, and then was allowed to stand for 18 hours. It was then filtered rapidly taking care not to lose any solvent; 25 ml of this filtrate was transferred to a tarred flat-bottomed dish and was evaporated to dryness on a water-bath. It was followed by drying at 105°C for 6 hours, cooled in a desiccator for 30 minutes and was weighed without delay. The content of extractable matter in mg per g of air-dried material was then calculated.

### Sample characterization

To record the UV-Vis spectra of 50% Hydroalcoholic extract of Amalakyadi Gana the sample were scanned in the wavelength range 200–700 nm by using UV-Vis spectrometer (Perkin Elmer Lambda 25). UV-Vis spectrometer used for characterization is double beam spectrometer in which deuterium lamp is used for UV radiation and tungsten-halogen lamp is employed for visible (Vis.) radiation.

## RESULTS

Figs. exhibit the UV-Vis spectra of samples of Hydroalcoholic extract of Amalakyadi Gana. The UV-Vis profile sample showed the peaks at 213 nm and 267 nm. The results obtained in UV-Vis spectra revealed the existence of several medicinally important phyto-constituents.



**Fig. 2: UV –Vis spectrum of 50% Hydroalcoholic extract of Amalakyadigana.**

## DISCUSSION

The UV-Vis profile (**Figs 2**) of the 50% Hydroalcoholic extract of **Amalakyadi Gana** are recorded successfully in the wavelength range of 200-700 nm and studied carefully. UV-Vis spectrum of sample shows a major band 267 nm. UV-Vis spectroscopy of the Hydroalcoholic extract of **Amalakyadi Gana** confirms the presence of tannins and/or **flavonoids**. Tannins (phenolic compounds) and flavonoids (poly-phenolic compounds) typically exhibit their presence in the range of 230-290 nm<sup>5,6,7,8</sup>. Phytochemicals containing tannins have been used for the treatment of chronic diseases. Tannins: phenolic compounds have already been reported as potential free radical scavengers<sup>8,9</sup>. The tannins contained plants are found to have significant activity in prevention of cancer-like horrific nosogenic disease. Not only this, these plants are also used potentially in treatment of intestinal disorders<sup>6-9</sup>. Flavonoids may be present in forms of Isoflavones, Flavonones, Flavones 3 (Apigenin and Luteolin), Flavonols (Kaempferol and Quercetin), Chalcones and Aurones 3, Anthocyanins as a phytoconstituent<sup>10</sup>. Flavonoids are known to possess a wide range of biological activities such as Anti-oxidant, Anti-inflammatory, Anti-microbial along with the Anti-cancerous activities.<sup>[8-12]</sup>

## CONCLUSION

UV-Vis spectra of 50% Hydroalcoholic extract of Amalakyadi Gana the sample were scanned. In order to identify the phyto-constituents of 50% Hydroalcoholic extract of Amalakyadi Gana the phyto-chemical screening has been carried out by using UV-Vis

spectroscopic technique. A careful examination of UV-Vis spectral profiles of 50% Hydroalcoholic extract of Amalakyadi Gana confirms the presence of tannins and flavonoids. Tannins and flavonoids are very useful in treatment of chronic and intestinal disorders diseases. Since, tannins (Phenolic compounds) are potential free radical scavengers thus, Amalakyadi Gana may also be used to prevent several diseases including cancer-like horrific nosogenic disease.

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