

## ***AQUEOUS EXTRACTION OF NIMBA PATRA (Azadirachta indica A. Juss) AND ITS PHYTOCHEMICAL ANALYSIS***

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### **ABSTRACT**

Herbal preparations are used to treat many infectious diseases. *NimbaPatra* is described as *Krimighna* in *Ayurveda* and researches show its antimicrobial effects against microorganisms. Therefore, Present study was planned to isolate active ingredients of *Nimba Patra* by aqueous extraction with soaking method. Extraction is the separation processes for the isolation of the active components of any herbal plants or materials. 25 gm of shade dried coarse powder of *Nimba Patra* and 100 ml of distilled water as extraction solvent was taken. On fourth day the process was completed. After evaporation of the aqueous extract by water bath, 3.54 gm of the aqueous extract was obtained. To find out the phytochemical constituents, the aqueous extract of *Nimba Patra* was subjected to phytochemical analysis. The results of the phytochemical analysis of aqueous extract of *Nimba Patra* showed presence of alkaloids, glycosides, saponins and sugar.

**Key words:** Aqueous extract, *Nimba Patra*, Phytochemical Analysis

### **INTRODUCTION**

Throughout the history of mankind herbal preparations are used to treat many infectious diseases. Plants play a major role in the primary health care as therapeutic preparations. For this reason, the discovery of medicinal plants as antimicrobial agents is useful as herbal antibiotics.

According to WHO herbal extracts or their active components are used as folk medicine in traditional therapies in 80% of the world's population.<sup>1</sup> Between 1981 and 2002, about 61% of new drugs were developed based on herbal products and they have been very effective in the areas of infectious disease and cancer<sup>2</sup>.

A wide range of technologies is available for the extraction of active components and essential oils from medicinal plants. The term extraction pharmaceutically involves the separation of medicinally active portion of the plants or tissues from the inactive or inert component by using solvent with standard extraction procedure. Extraction procedures contribute significantly to the final quality of herbal drug. The purpose of standardized extraction procedures for the crude drugs is to attain the therapeutically desired portion and to eliminate the inert material by using with selective solvents. In extraction process whole part of drug is strained out and further used for various therapeutic purposes.

Extraction is the process for the isolation of the active ingredients from the drug. Extraction is separation process of a substance from components as extractive medium water is most commonly used. Alcohol, ether and other chemicals are also used as an extractive medium. In this study aqueous extraction of shade dry coarse powder of *Nimba Patra* is dealt.

## **DRUG COLLECTION**

The fresh leaves of *Nimba (Azadirachta indica A.juss)* were collected from Sri Dharmasthala Manjunatheshwara College of Ayurveda & Hospital botanical garden. The fresh leaves were washed under tap water and shade dried. Completely dried leaves were grounded to course powder. It was stored in a clean and air tight container.

## **AUTHENTICATION OF THE DRUG**

(*Azadirachta indica A.juss*) authentication of the drug *Nimba* was done by the Department

of Dravyaguna, in Sri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Hassan, Karnataka.

## **METHODOLOGY**

Preparation of Aqueous extract of *Nimba Patra (Azadirachta indica A.Juss)*

Requirements: Shade dried *Nimba Patra* coarse powder- 25 gms

Distilled water - 100 ml

## **NIMBA PATRA AQUEOUS EXTRACTION**

*Nimba (Azadirachta indica A.Juss)* aqueous extract was prepared by mixing 25 grams of shade dried coarse powder of *Nimba* leaves with 100 ml of sterile distilled water in a flask with occasional shaking. From 8 am to 6 pm every one hour shaking was done for 15 minutes. After 3 days the extract was filtered through whatman filter paper. After filtration 90 ml aqueous extract was obtained. The obtained extracts were then subjected to water bath at 60°C and evaporated to dryness and stored in air tight bottles at 4°C for further use. Aqueous extract was further diluted to required concentration.

## **PHYTOCHEMICAL ANALYSIS OF AQUEOUS EXTRACT OF NIMBA PATRA**

*Nimba Patra (Azadirachta indica A.Juss)* aqueous extract was subjected to phytochemical analysis. Presence of alkaloids (Drangendorff's test), tannins (Lead acetate solution test), glycosides (Bornstrager's test), saponins (Foam test), and sugar (Benedict's test) were evaluated.

**1. Test for Alkaloids<sup>3</sup>:** 2-3 ml of aqueous extract of *Nimba Patra* was added with few

drops of Drangendorff’s reagent in test tube. Orange brown precipitate indicates presence of Alkaloids in aqueous extract of Nimba Patra.

**2. Test for Tannins<sup>3</sup>:** 2-3 ml of aqueous extract of *Nimba Patra* was added with few drops of lead acetate solution in test tube. White precipitate was observed in test tube.

**3. Test for Glycosides<sup>4</sup>:** 5 ml of aqueous extract of *Nimba Patra* was added with 5 ml 5% FeCl<sub>3</sub> and 5 ml dilute HCL. Heat for 5 min in boiling water bath and after cooled added with benzene solvent. Test tube was shaken well. After that separation of Organic layer was done. Added equal volume dilutes ammonia. After some time ammoniacal layer was appeared. Pinkish red color was not observed in test tube. This shows the absent of glycosides.

**4. Test for Saponins<sup>4</sup>:** Aqueous extract of *Nimba Patra* was shaken with distilled water. Persistent foam was observed in test tube.

**5. Test for Sugars<sup>5</sup>:** Mixed equal volume of Benedict’s reagent and Aqueous extract solution in test tube. Heated in boiling water bath for 5 min. Solution appears green color in test tube.

**OBSERVATION AND RESULTS**

*Nimba Patra (Azadirachta indica A.Juss)* aqueous extract was prepared by mixing 25 gms of shade dry coarse powder of *Nimba Patra* with 100 ml of sterile distilled water. Observation after evaporation is mentioned as below.

**Table 1:** Aqueous extract of *Nimba Patra*

Day	Date	Content	Time	Temperature
1	27/7/2015	Distilled water -100 ml <i>Nimba Patra</i> - 25 gm( coarse powder)	From 8 am to 6 pm hourly shaking for 15 min	Room temperature
2	28/07/2015		From 8 am to 6 pm hourly shaking for 15 min	Room temperature
3	29/07/2015		From 8 am to 6 pm hourly shaking for 15 min	Room temperature
4	30/07/2015	After filtration with whatman filter paper aqueous extract - 90 ml Evaporation on waterbath – 10:30 am to 5:30 pm		60°C

**Table 2:** Measurement of aqueous extract of *Nimba Patra*

Aqueous extraction of <i>Nimba Patra</i>	Weight
Weight of empty vial	20.7 gm
Weight along with extract	24.24 gm
Aqueous Extract after evaporation	3.54 gm

On the third day the soaking process was completed. 3.54 gm of the aqueous extract was

obtained after evaporation of the aqueous extract by water bath. Obtained aqueous extract

was solid in nature. The whole process of aqueous extraction of *Nimba Patra* was completed in 4 days. After evaporation 3.54 gram

of aqueous extract of *Nimba Patra* was obtained.

**Table 3:** Phytochemical Analysis of Aqueous Extract of *Nimba Patra*

Sr.No	Phytochemical of Nimba Patra	Test name	Result
1	Alkaloids	Drangendorff's test	Present
2	Tannins	Lead acetate solution test	Present
3	Glycosides	Bornstrager's test	Absent
4	Saponins	Foam test	Present
5	Sugar	Benedict's test	Present

## DISCUSSION

The reason for using aqueous extraction method is because it is very easy to prepare and potent among all dosage forms and is very commonly used in day to day practice. The soaking method is very simple and cheap.

In *Ayurveda* various drugs are mentioned which are also ascribed with *Krimighna* action by various *Acharyas*. *Nimba* is mentioned as *Krimighna* and *Krimihara* in *Samhita*. In *Charaka Samhita* *Nimba* is mentioned in *Kandugna* and *Tikta Skanda*.<sup>6</sup> It pacifies *Kapha* and *Pitta Dosha*, prevents formation and growth of *Krimis*.<sup>7</sup> *Nimba* is described to be useful against ulcers, wounds, skin diseases etc. *Nimba patra* paste is applied to boil, ulcer, abscess, inflammation and other similar ailing conditions. *Nimba (Azardirachta indica A.juss)* has antibacterial, antifungal, anti-parasitic and antiviral properties.<sup>8</sup> *Nimba* was selected because of its properties and ascribed actions.

The phyto constituents like alkaloids, glycosides, saponins etc are active principles of the plant responsible for therapeutic action. Saponin extract are inhibitory to the growth of the gram positive bacteria<sup>9</sup> and alkaloids displays

good antimicrobial activity against test micro-organism<sup>10</sup>.

The phyto-constituents like alkaloids, glycosides, saponins etc are active principles of the plant having defensive mechanism against different pathogens. The phytochemical analysis showed the presence of tannins, alkaloids, sugars and saponin in of the *Nimba patra* in present study.

## CONCLUSION

Aqueous extract is very easy to prepare and potent among all dosage forms. *Nimba* is a widely used drug in folklore and *Ayurveda* due to its chemical constituents like alkaloids, glycosides; saponins etc are active components principles of the plant having defensive mechanism against different pathogens. *Nimba* has antibacterial, antifungal, antiparasitic and antiviral properties. As the global scenario is now changing towards the use of nontoxic plant products having traditional medicinal use, thus the development modern evidence based *Ayurveda* drugs like *Neem* should be emphasized for the control of various infections.



**Nimba patra with sterile distilled water in a flask**



**Filtration of aqueous extract through whatman filter paper**



**Aqueous extract of *Nimba patra***



**Weight after evaporation of aqueous extract**

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