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Organoleptic and Preliminary Phytochemical Study of Achchhuka (Morinda Citrifolia)

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ABSTRACT

A systematic study of crude drug embraces, thorough consideration of primary and secondary metabolites derived as a result of plant metabolism. The compounds that are responsible for medicinal property of the drug are usually secondary metabolites. The fruit of *Achchhuka* is subjected to organoleptic and preliminary phytochemical screening for detection of various properties (*Rasa*(taste), *Virya*(potency)) and its chemical constituents which are responsible for pharmacological or therapeutic activity and play important role in identification and authentication of drug, the first and foremost step in any of the drug research.

Key Words:-Achchhuka, organoleptic, preliminary phytochemical.

INTRODUCTION

Achchhuka fruit famous in the name Noni as we now know it as *Morinda citrifolia* has a rich history in India This fruit finds place in our ancient medicinal text of Ayurveda & Siddha & in Tamilnadu at one time, this tree was a must to grow in every temple along with *Tulsi* & *Bilva* trees[1]

The words *Akshiki*[2] and *Akshika* phala[3] are mentioned under *phala varga* in charak samhita and sushruta samhita respectively Here Acharya Vidyadhar Shukla & Prof. Ravidutt Tripathi told that *Akshiki* is *Achchhuka phala*[4]. *Akshika* is told to be *Achchhuka vruksha* [5] & is given the name as *Morinda citrifolia*[6] .

In modern botanical texts & some different floras, the drug is identified as *Morinda citrifolia* [7,8,9,10.].

Plants contain different chemical constituents. These chemical constituents may be therapeutically active or inactive.

The one which are active are called as active constituents or active principles (alkaloids, glycosides, etc.) which are responsible for pharmacological or therapeutic activity.

The organoleptic and preliminary phytochemical studies are essential to know the basic constituents present in drug. It helps to get an idea about the enormous variety of organic substances. The action of a drug depends upon the basic components present in the drug. This analysis will help to know the rasa, *virya* (potency) and the chemical constituents present in *Achchhuka* (*Morinda citrifolia*) fruit which are responsible for the pharmacological or therapeutic action.

MATERIALS AND METHODS

Taste determination by voluntary trials [11]

'Taste with tongue' is the criterion for determining the *rasa* primary taste) or *anurasa*(secondary taste) of a drug.

The following procedure for taste with tongue was adopted.

Unripe fruits of *Morinda citrifolia* were collected & dried. Fine powder was made.

25 Healthy volunteers, preferably Ayurvedic students, who may not make mistakes in expressing the rasa they perceive, were selected. They were asked to wash their mouth & five minutes gap was allowed between washing of mouth & tasting of drug.

Five grams of powder was served to these volunteers. Chits of paper were given to them & they were requested to record the rasa & *anurasa* they perceive.

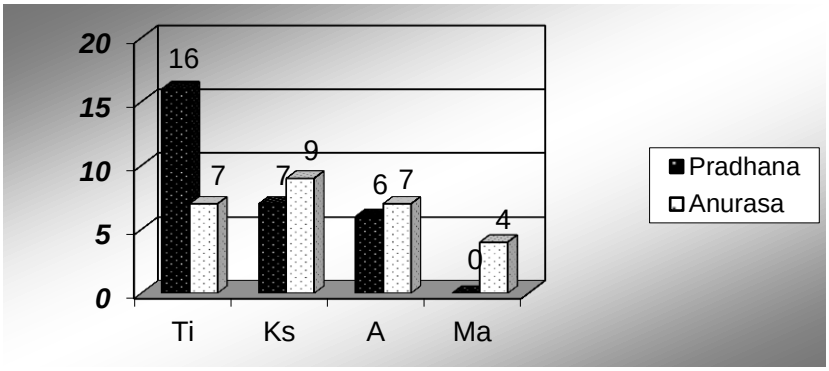
The method followed was blind method, in which volunteers were not told about the identity of drug.

Observations

Table no. 1

Rasa	Pradhana	Anurasa	Total
Tikta	16	7	23
Kashaya	7	9	16
Amla	6	7	13
Madhura	0	4	4

Figure no. 1



Method to determine the taste threshold [11]

In cold water

Five grams of drug powder was taken & put in 100 ml of water. It was stirred for 30 minutes. Then it was filtered with the filter paper. 1ml of filtered solution was taken & was diluted with distilled water gradually. The point at which the taste was last perceived was considered as the taste threshold of that taste in that drug. Any further dilutions of solutions would reveal no taste.

In hot method [11]

Five gram of drug powder was put in 100ml of water & boiled till it was reduced to 50ml. while boiling it was stirred & then filtered. 1ml of this filtered solution or decoction was taken & tasted. Then it was diluted gradually with cold water till the taste was perceived. Taste threshold was recorded.

Observations

Table no. 2

Rasa	Hot infusion	Cold infusion
Tikta rasa	2000ml	2000ml
Amla rasa	2300ml	

Taste determination by taste threshold shows presence of *Tikta*(bitter) *rasa* as *pradhana* & *Amla*(sour) as *anurasa*

Determination of *virya*(potency) [12]

100 grams of drug powder was added to 100ml of distilled water & the reactions were noted for an hour.

Determination of *virya*(potency) was done on the basis of action on appetite, sleep, stool & urine. Drug was administered in powder form to five healthy volunteers for three days & mean was taken for concluding the results.

Observations

Exothermic and endothermic reactions noted for an hour shows rise in temperature by 0.2 ºF, suggestive of *Ushna*(hot) *virya* of drug.

In voluntary studies appetite was found increased in all the five volunteers. Condition of urine and stools was normal. Sleep was less affected. Feeling just after administration of drug was *Ushna*(hot). All the above results suggest presence of *Ushna*(hot) *virya* in Achchhuka.

Preliminary phytochemical study of Achchhuka(Morinda citrifolia)

The preliminary tests were made by using the five different extracts of *Morinda citrifolia.*

RESULTS

Table showing the components present in five extracts of *Morinda citrifolia* fruit after conducting preliminary phytochemical studies

Table no. 3

Sr no	Tests	Cold Infusion	Hot infusion	Petroleum ether	Ethanol	Chloform
1.	Proteins					
a.	Biuret test	+ve	-ve	-ve	-ve	-ve
b.	Ninhydrin test	-ve	-ve	-ve	-ve	-ve
c.	Xanthoproteic test	+ve	+ve	-ve	+ve	+ve
d.	Hopkins-cole test	+ve	+ve	-ve	-ve	-ve
e.	Sulphur test	Traces	traces	-ve	-ve	-ve
2.	Carbohydrate test for starch					
a.	Molisch's test	traces	-ve	-ve	-ve	-ve
b.	Iodine test	-ve	-ve	-ve	-ve	-ve
c.	Fehling's test	+ve	+ve	-ve	+ve	-ve
d.	Benedict's test	+ve	+ve	-ve	-ve	-ve
e.	Test for non reducing sugar such as sucrose	-ve	-ve	-ve	-ve	-ve
3.	Tannins					
a.	Gelatin test	-ve	-ve			
4.	Anthrocyanins					
a.	Aqueous NaOH test	-ve	-ve	-ve	-ve	-ve
b.	Conc. H_2SO_4 test	-ve	-ve	+ve	+ve	+ve
5.	Glycosides					
a.	Molisch's test	+ve	+ve	+ve	+ve	+ve
b.	Conc. H_2SO_4 test	+ve	+ve	-ve	Traces	+ve
c.	Keller Kiliani test	+ve	+ve	Traces	Traces	+ve
6.	Saponin					
a.	Foam test	-ve	-ve	-ve	-ve	-ve
7.	Flavanoids					
a.	Flavanoid test			-ve	-ve	+ve
b.	Pew's test for dihydroflavanols	+ve	+ve	-ve	-ve	-ve
c.	Shinoda test	-ve	-ve	-ve	-ve	+ve
d.	Aqueous NaOH test	+ve	+ve	-ve	-ve	-ve
e.	Conc. H_2SO_4 test	+ve	+ve	-ve	-ve	+ve
8.	Phenols					
a.	Phenol test	+ve	+ve	-ve	-ve	-ve
9.	Steroids					
a.	Salkowski's test	-ve	-ve	-ve	-ve	Traces
10	Alkaloids					
a.	Mayer's test	-ve	-ve	-ve	-ve	-ve
b.	Dragendroff's test	-ve	-ve	-ve	-ve	-ve

CONCLUSION

Tikta rasa(bitter taste) is predominant in the unripe berries of Achchhuka and *kashaya*(astringent), *Amla*(sour) and *Madhura*(sweet) are *anurasas*. *Virya* is *Ushna*.

Preliminary phytochemical studies reveals presence of proteins, carbohydrates, glycosides, flavanoids & phenols in aqueous extracts; anthocyanins & glycosides in petroleum ether extract; proteins, carbohydrates, anthocyanins & glycosides in ethanol extract & proteins, anthocyanins, glycosides, flavanoids & steroids in chloroform extract.

All this studies play important role in identification and authentication of drug, the first and foremost step in any of the drug research.

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