

Comparative Phytochemical Study of Nava and Purana Guggulu

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Abstract: Guggulu is used in number of formulations and it is also used as binding agent in preparation of vati(tablets) kalpana. Two types of guggulu are mentioned in the classical texts viz. nava and purana guggulu. Both have different properties and actions. For detection of its chemical constituents which are responsible for pharmacological or therapeutic activity the oleo gum resin of nava guggulu and purana guggulu was subjected to preliminary phytochemical screening which play important role in identification and authentication of drug, the first and foremost step in any of the drug research. The similarities and the dissimilarities in the chemical constituents and also in their properties and actions were noted which will help to use the drug in appropriate form.

Key words : Oleo gum resin, nava guggulu, purana guggulu, phytochemical

1. Introduction

Guggulu is one of the noted drugs from Ayurveda and Unani system. It is the oleo-gum-resin obtained by making deep incisions at the basal part of stem bark of *Commiphora mukul* belonging to family *Burseraceae*.^[1]

English name- Indian bedellium^[2]

Hindi- Gugal^[2]

In recent times, its demand in therapeutics has been substantially increased.

Nava and purana guggulu are the two varieties of guggulu mentioned in the nighantu. Both have totally different properties and actions. Nava guggulu is bruhana and vrushya while purana guggulu is lekhana.^[3]

The action of drug depends upon the basic chemical components present in the drug. Here an attempt is made to know the difference and the similarities in the chemical constituents present in nava and purana guggulu which are responsible for different pharmacological actions by performing preliminary phytochemical analysis.

II. About Plant

Morphology- It grows upto 2-3 metres as a woody tree and shows spinescent branches on pale yellow to brownish stem. It has characteristic silvery and paper like bark peelings. It bears compound leaves with ovale subsessile leaflets and they are serrated with smooth upper surface.^[4]

Charak Samhita- mentioned in sangyasthapana mahakashaya^[5]

Sushruta Samhita- mentioned in Eladi gana^[6]

Bhavaprakash Nighantu- Karpuradi varga^[7]

Chemical constituents- Steroids, diterpenoides, carbohydrates and aliphatic esters. The purified gum gives pentosan, pentose and furfural. Steam distillation of guggulu gives pale yellow volatile oil containing the terpenes like myrcene and caryophylline. Guggulu contains Z-guggulusterone, E-guggulusterone and three new sterols viz. guggulusterol I, II, III.^[8]

Varieties^[9]

Bhava prakash nighantu- 2 types

1. Nava Guggulu

2. Purana Guggulu

Properties and actions of nava and purana guggulu

स नवो बृहणो वृष्यः पुराणस्त्वतिलेखनः।

स्निग्धः काञ्चनसंकाशः पक्वजम्बूफलोपमः।

नूतनो गुग्गुलुः प्रोक्तः सुगन्धिर्यस्तु पिच्छिलः।

शुष्को दुर्गन्धकश्चैव त्यक्तप्रकृतिवर्णकः।

पुराणः स तु विज्ञेयो गुग्गुलुर्वीर्यवर्जितः।

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Table no. 1

	Nava(Fresh) guggulu	Purana(old) guggulu
Varna (colour)	Kanchana sankasha(Bright yellow) or pakva jambu phala sadrusha(Dark brown)	Tyakta prakruti varna (yellowish brown)
Gandha(odour)	Sugandha(pleasant)	Durgandha (offensive)
Guna(qualities)	Snigdha(unctuous), picchila(Slimy)	Laghu(lighter), ruksha(rough), tikshna, Vishad(clean), sukshma, sara
Karma(actions)	Bruhana, Vrushya	Lekhana

Note – Guggulu older than 5 years is considered as purana Guggulu.

Doshakarma- vata kapha shamaka^[10]

Pharmacological actions^[10]

Anti obesity, Anti-inflammatory, Hypolipidemic, Hypocholesterolemic, Antiarthritic, Antifertility, Antiatherosclerotic

Indications^[10]- vatavyadhi, sthauya(obesity), amavata(rheumatoid arthritis), urushambha, shotha(oedema), vatarakta(gout), vidradhi(abcess)

Therapeutic dose- Nirayasa(gum resin)- 2 to 4gm^[11]

Prashasta guggulu- snigdha(unctuous), mrudu(soft), picchila(slimy), madhura Gandhi(good smell), tikta(bitter), pitabha(yellowish in colour), easily soluble in water, burns well when put on fire, devoid of mud and sand is the best form of guggulu^[11].

Shushka(dry), durgandhi(bad odour), vivarna(discoloured), and nirvirya(devoid of potency) guggulu should not be used in medicine^[11].

Contraindications during guggulu administration- amla food (sour), tikshna(penetrating), madya(alcoholic drinks), ajirna bhojana(indigestion), maithuna(intercourse), vyayama(exercise), atapasevana(exposure to hot climatic condition), krodha(anger)^[11].

Excessive and long term use of guggulu leads to timira, mukhashosha(dryness in mouth), klaibya(sterility), krushata(lean), murcha(giddiness), shithilya(lossiness), roukshya(dryness). Guggulu should be used after purification. Cow's milk, cow's urine, triphala quath, etc are used for purification^[11].

Preliminary phytochemical study of nava and purana guggulu(Commiphora mukul)

The preliminary tests were made by using the four different extracts of *Commiphora mukul*.

III. Results

Table showing the components present in four extracts of oleo gum resin of nava guggulu(*Commiphora mukul*) after conducting preliminary phytochemical studies

Table no.2

Sr no	Tests	Hot infusion	Petroleum ether	Ethanol	Chloform
1.	Proteins				
a.	Biuret test	-ve	-ve	-ve	-ve
b.	Ninhydrin test	-ve	-ve	-ve	-ve
c.	Xanthoproteic test	+ve	+ve	+ve	+ve
d.	Hopkins-cole test	-ve	-ve	-ve	-ve
e.	Sulphur test	+ve	-ve	+ve	+ve
2.	Carbohydrate test for starch				
a.	Molisch's test	+ve	+ve	+ve	+ve
b.	Iodine test	-ve	-ve	-ve	-ve
c.	Fehling's test	+ve	-ve	+ve	-ve
d.	Benedict's test	-ve	-ve	-ve	-ve
e.	Test for non reducing sugar such as sucrose	+ve	+ve	-ve	+ve
3.	Tannins				
a.	Gelatin test	-ve	-ve	-ve	-ve
4.	Anthrocyanins				
a.	Aqueous NaOH test	-ve	-ve	-ve	-ve
b.	Conc. H ₂ SO ₄ test	-ve	+ve	+ve	+ve
5.	Glycosides				
a.	Molisch's test	+ve	+ve	+ve	+ve

b.	Conc. H ₂ SO ₄ test	-ve	+ve	+ve	+ve
c.	Keller Kiliani test	+ve	+ve	+ve	+ve
6.	Saponin				
a.	Foam test	+ve	-ve	+ve	-ve
7.	Flavanoids				
a.	Flavanoid test	-ve	+ve	-ve	+ve
b.	Pew's test for Dihydroflavanols	-ve	-ve	-ve	-ve
c.	Shinoda test	-ve	-ve	-ve	-ve
d.	Aqueous NaOH test	+ve	-ve	+ve	+ve
e.	Conc. H ₂ SO ₄ test	+ve	+ve	+ve	+ve
8.	Phenols				
a.	Phenol test	-ve	-ve	+ve	-ve
9.	Steroids				
a.	Salkowski's test	-ve	-ve	+ve	+ve
10	Alkaloids				
a.	Mayer's test	-ve	-ve	+ve	+ve
b.	Dragendroff's test	-ve	-ve	-ve	-ve

Table showing the components present in four extracts of oleo gum resin of purana guggulu(*Commiphora mukul*) after conducting preliminary phytochemical studies

Table no. 3

Sr no	Tests	Hot infusion	Petroleum ether	Ethanol	Chloform
1.	Proteins				
a.	Biuret test	-ve	-ve	-ve	-ve
b.	Ninhydrin test	-ve	-ve	-ve	-ve
c.	Xanthoproteic test	-ve	+ve	-ve	Traces
d.	Hopkins-cole test	+ve	+ve	+ve	+ve
e.	Sulphur test	+ve	-ve	+ve	+ve
2.	Carbohydrate test for starch				
a.	Molisch's test	-ve	-ve	traces	-ve
b.	Iodine test	-ve	-ve	-ve	-ve
c.	Fehling's test	-ve	-ve	-ve	+ve
d.	Benedict's test	-ve	-ve	+ve	+ve
e.	Test for non reducing sugar such as sucrose	+ve	+ve	-ve	-ve
3.	Tannins				
a.	Gelatin test	-ve	-ve	-ve	-ve
4.	Anthrocyanins				
a.	Aqueous NaOH test	-ve	-ve	-ve	-ve
b.	Conc. H ₂ SO ₄ test	-ve	traces	-ve	traces
5.	Glycosides				
a.	Molisch's test	-ve	+ve	+ve	+ve
b.	Conc. H ₂ SO ₄ test	+ve	+ve	+ve	+ve
c.	Keller Kiliani test	+ve	+ve	+ve	+ve
6.	Saponin				
a.	Foam test	+ve	-ve	-ve	-ve
7.	Flavanoids				
a.	Flavanoid test	-ve	-ve	+ve	-ve
b.	Pew's test for Dihydroflavanols	-ve	-ve	-ve	-ve
c.	Shinoda test	-ve	-ve	-ve	-ve
d.	Aqueous NaOH test	+ve	+ve	+ve	+ve

e.	Conc. H ₂ SO ₄ test	+ve	+ve	+ve	+ve
8.	Phenols				
a.	Phenol test	+ve	+ve	+ve	traces
9.	Steroids				
a.	Salkowski's test	-ve	+ve	+ve	+ve
10	Alkaloids				
a.	Mayer's test	+ve	-ve	+ve	traces
b.	Dragendroff's test	-ve	-ve	-ve	-ve

IV. Observations and discussion-

Similarities-

Nava and purana guggulu shows presence of proteins, carbohydrates, glycosides, flavanoids in all the four extracts (aqueous, petroleum ether, ethanol and chloroform extract). Anthrocyanins are also present in petroleum ether and chloroform extract of nava and purana guggulu and absent in aqueous extract. They also show presence of saponins in aqueous extract, phenols in ethanol extract, steroids in ethanol and chloroform extracts and alkaloids in ethanol and chloroform extracts of nava and purana guggulu.

Anthrocyanins are absent in aqueous extract, saponins are absent in petroleum ether and chloroform extracts, steroids are absent in aqueous extract and alkaloids are absent in petroleum ether extract of nava and purana guggulu.

Dissimilarities-

Anthrocyanins and saponins are present in ethanol extract of nava guggulu which is absent in purana guggulu.

Phenols are present in only ethanol extract of nava guggulu where as it is present in all four extracts of purana guggulu.

Steroids are absent in petroleum ether extract of nava guggulu and they are present in the same in purana guggulu.

Alkaloids are absent in aqueous extract of nava guggulu and present in the same in purana guggulu.

V. Conclusion

There are minute differences found in phytochemical study of nava and purana guggulu like Anthrocyanins and saponins are present in ethanol extract of nava guggulu which is absent in purana guggulu, Where as they show many similarities in phytochemical studies like Nava and purana guggulu shows presence of proteins, carbohydrates, glycosides, flavanoids in all the four extracts (aqueous, petroleum ether, ethanol and chloroform extract). Guggulu is mainly used as Anti obesity, Anti-inflammatory, Hypolipidemic, Hypocholesterolemic, Antiarthritic, Antifertility, Antiatherosclerotic. For this purpose purana guggulu can be used whereas for rasayan(rejuvenation) nava guggulu can be a drug of choice.

Further research is essential to know the other differences seen in nava and purana guggulu

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