



## PHYTOCHEMICAL ANALYSIS OF BILVADI GUTIKA

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## ABSTRACT

Aim: Phytochemical analysis of drugs is done to know the chemically active principles of *bilvadi gutika*. Methods: The phytochemical analysis of extract of formulation of *bilvadi gutika* an herbal formulation which is mentioned in the context of treatment of poisoning is done. Results: The formulation is said to have the following constituents like alkaloids, steroids, tannin, flavonoids, coumarins, resin and quinone that are present in the ingredients of the formulation as well. Discussion: The extract of formulation *bilvadi gutika* was done for primary phytochemical analysis and was found to have alkaloids, tannins, steroids, flavonoids, coumarins, resin and quinine. With this metabolic compound the drug will have its mode of action. The individual ingredients may have different phytochemicals but when it comes as a combination it may change. Conclusion: The formulation is said to have the following constituents like alkaloids, steroids, tannin, flavonoids, coumarins, resin and quinone. Hence the action of the formulation can be understood as the action of these phytochemical constituents

**KEY WORDS:** Bilvadi gutika, phytochemical constituents, alkaloids, steroids

## INTRODUCTION

The word 'phyto' in Greek means plant. Phytochemicals also known as phytonutrients are natural non-essential chemical compounds found in plants. They occur in vegetables, grains, legumes, beans, fruits, herbs, nuts, roots, leaves and seeds. These are compounds which give the plant their color, flavor and smell. These are responsible for the medicinal properties and health benefits of medicinal herbs. In addition, phytochemicals also include poisonous and toxic chemicals found in plants<sup>1</sup>. Bilvadi gutika is an herbal formulation

mentioned in the treatment of poisoning. It consists of drugs like bilva (*Aegle marmelos*), surasa (*Ocimum sanctum*), karanja (*Pongamia pinnata*), tagara (*Valeriana wallichii*), devadaru (*Cedrus deodara*), hareetaki (*Terminalia chebula*), vibheetaki (*Terminalia bellerica*), amalaki (*Emblca officinalis*), shunti (*Zingiber officinale*), pippali (*Piper longum*), maricha (*Piper nigrum*), haridra (*Curcuma longa*), daruharidra (*Berberis aristata*). The media used for trituration is goat's urine<sup>2</sup>. The phytochemical analysis of formulation gives the combined effect of all drugs included in the formulation.

## MATERIALS AND METHODS

Table 1: Bilvadi gutika

Sl. No	Ingredients	Botanical name	Used part	Quantity
1	Bilva	<i>Aegle marmelos</i>	Root	1 part
2	Surasa	<i>Ocimum sanctum</i>	Flower	1 part
3	Karanja	<i>Pongamia pinnata</i>	Fruit	1 part
4	Tagara	<i>Valeriana wallichii</i>	Root	1 part
5	Devadaru	<i>Cedrus deodara</i>	Heart wood	1 part
6	Hareethaki	<i>Terminalia chebula</i>	Fruit	1 part
7	Vibheetaki	<i>Terminalia bellerica</i>	Fruit	1 part
8	Amalaki	<i>Emblca officinalis</i>	Fruit	1 part
9	Shunti	<i>Zingiber officinale</i>	Rhizome	1 part
10	Maricha	<i>Piper nigrum</i>	Fruit	1 part
11	Pippali	<i>Piper longum</i>	Fruit	1 part
12	Haridra	<i>Curcuma longa</i>	Rhizome	1 part
13	Daruharidra	<i>Berberis aristata</i>	Root	1 part
14	Aja mootra (goat's urine)			Quantity sufficient

- All the above drugs were taken in equal quantity, made into fine powder and triturated with goat's urine till it attained subhavitha lakshana (proper consistency) and rolled into vati (pills) and dried in shade<sup>3</sup>.
- These pills were used for phytochemical analysis.

### Preliminary phytochemical tests<sup>4</sup>

#### Test for alkaloids

**Wagner's test:** About 1ml of leaf extract and 1ml of Wagner's reagent (dilute iodine solution) were added and mixed. Formation of reddish brown precipitates indicates the presence of alkaloids.

**Dragendroff's test:** To a few milligrams of extract dissolved in alcohol, a few drops of acetic acid and dragendroff's reagent were added and shaken well. An orange red precipitate formed indicates the presence of alkaloids.

**Mayer's test:** To a few milligrams of extract dissolved in acetic acid, a few drops of mayer's reagent was added. A dull white precipitate formed indicates the presence of alkaloids.

**Hager's test:** To a few milligrams of extract dissolved in acetic acid, 3 ml of hager's reagent was added; the formation of yellow precipitate indicates the presence of alkaloids.

#### Test for carbohydrates

**Molisch's test:** To the extract, 1 ml of  $\alpha$ -naphthol solution and conc. sulphuric acid were added along the sides of test tube. Violet colour formed at the junction of the two liquids indicates the presence of carbohydrates.

**Fehling's test:** A few milligrams of extract were mixed with equal quantities of Fehling's solution A and B. The mixture was warmed on a water bath. The formation of a brick red precipitate indicates the presence of carbohydrates.

**Benedict's test:** To 5 ml of Benedict's reagent, a few milligrams of extract was added, and boiled for two minutes and cooled. Formation of a red precipitate indicates the presence of carbohydrates

#### Test for steroids

**Liebermann Burchard test:** To the extract dissolved in chloroform, 1 ml of acetic acid and 1 ml of acetic anhydride were added, then heated on a water bath and cooled. Few drops of con.  $H_2SO_4$  were added along the sides of the test tube. Appearance of bluish green color indicates the presence of steroids.

**Salkowski test:** The extract was dissolved in chloroform and equal volume of con.  $H_2SO_4$  was added. Formation of bluish red to cheery red colour in chloroform layer and green fluorescence in the acid layer indicates the presence of steroids.

**Test for saponins:** To a few milligrams of extract, distilled water was added and shaken. Stable froth formation indicates the presence of saponin.

**Test for tannin:** To the extract a few drops of dilute solution of ferric chloride were added, formation of dark blue colour shows the presence of tannins.

#### Test for flavonoids

**Shinoda's test:** To the extract in alcohol, a few magnesium turnings and few drops of conc.  $H_2SO_4$  were added and heated on a water bath. Formation of red red to pink colour indicates the presence of flavonoids.

**Test for phenol:** To the extract in alcohol, added two drops of alcoholic ferric chloride. Formation of blue to blue black indicates the presence of phenol.

**Test for coumarins:** To the extract in alcohol, a few drops of 2 N sodium hydroxide solutions were added. Dark yellow colour formation indicates the presence of coumarins.

**Test for triterpenoids:** The extract was warmed with tin bits and few drops of thionyl chloride. Formation of pink colour indicates the presence of triterpenoids.

**Test for carboxylic acid:** Extract dissolved in water is treated with sodium bicarbonate. Brisk effervescence indicates the presence of carboxylic acid.

**Test for resin:** Few milligrams of the sample were mixed with water and acetone. Turbidity indicates the presence of resin.

**Test for quinine:** A few milligrams of alcohol extract were treated with 0.5% of sodium hydroxide. Deep colouration like pink, purple or red indicates the presence of quinine.

**Table 2: Phytochemical constituents of Bilvadi gutika**

Test	Inference
Alkaloid	+
Steroid	+
Carbohydrate	-
Tannin	+
Flavonoids	+
Saponins	-
Terpenoids	-
Coumarins	+
Phenols	-
Carboxylic acid	-
Amino acids	-
Resin	+
Quinone	+

## RESULTS AND DISCUSSION

The extract of formulation bilvadi gutika was done for primary phytochemical analysis and was found to have alkaloids, tannins, steroids, flavonoids, coumarins, resin and quinine. With this metabolic compound the drug will have its mode of action. The individual ingredients may have different phytochemicals but when it comes as a combination it may change. *Aegle marmelos* is having the phytochemicals like alkaloids, flavonoids, phenols, saponins, terpenoids, steroids and tannis<sup>5</sup>. *Ocimum sanctum*, *Zingiber officinale* and *Piper nigrum* has got flavonoids, alkaloids, saponins and phenolic compounds<sup>6</sup>. *Piper longum* is having alkaloids, saponins and carbohydrates<sup>7</sup>. *Pongamia pinnata* is containing alkaloids, carbohydrates, steroids, glycosides, proteins, saponins, flavonoids, phenols and gum<sup>8</sup>. *Valeriana wallichii* is having alkaloids, flavonoids, glycosides, steroids, saponins and terpenoids<sup>9</sup>. *Curcuma longa* is having tannis, alkaloids, saponins, flavonoids, terpenoids and cardiac glycosides<sup>10</sup>. *Terminalia chebula* is having glycosides, alkaloids, flavonoids, phenolic components, saponins, steroids, quinine and tannis<sup>11</sup>. *Terminalia bellerica* is having phenols, alkaloids, flavonoids and tannis<sup>12</sup>.

## CONCLUSION

The phytochemical analysis of formulation makes the mode of action of drug clearer and gives a better standardization of the drug. Individual drugs possess different actions, when a formulation is given the action may vary due to combination of

active principles. Almost all the individual drugs phytochemicals are present in the combination even after the processing. Hence the effect of drug when given in combination could have a great effect than giving individual drugs.

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