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# Phytochemicals investigated in dashparni ark

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**Abstract**
Dashparni ark is an excellent organic liquid bio-pesticide. It is useful to control pests and diseases occur in any crop, vegetables and fruit crops. It is a very powerful bio-pesticide prepared using natural ingredients of plant resources. It develops immunity within plants and shows antiviral, antibacterial and antifungal properties.
Phytochemical constituents in plants with a varied biochemical properties having protection activity has received attention to use them as plant protector or repellents. A major phyto-chemicals investigated in Dashparniark (Ten plants leaves) like saponin, proteins, phenol, steroid, phytosterol and chemical like anthocyanin, phlobatannins are absent. So they indicate that plant leaves contain a number of important chemical compounds which has different protection/repellent properties.

**Keywords:** dashparni ark, phytochemicals, *Vitexne gundo* L., *Carica papaya* L., *Aegle marmelos* L., *Tinospora cordifolia* (Willd).Hook, *Calotropis gigantean* L., *Jatropha curcus* L., *Melia azedarach* L., *Nerium oleander* L., *Ipomoea fistulosa* L. and *Lantana camara* L.

## Introduction

Ancient India's farmer's evolved nature friendly farming systems and practices. Agricultural activities were designed to ensure ecological sustainability. India developed its own holistic scientific knowledge. It has a number of classical texts related to agricultural science. Kautilya's Arthashastra, Patanjali's Mahabhasya, Krishi-Parashara, Varahmihira's Brhat Samhita, and Surapala'sVrikshayurveda are some of the manuscripts that contain valuable information about agricultural implements, selection of seeds, land preparation, pest control, storage, plant nutrients, grafting, soil selection, plant propagation, diseases and plant protection, mixed cropping, crop rotation, intercropping, shifting cultivation,terrace farming etc. India's traditional agriculture has proved to be sustainable by maintaining the country's fertility and biodiversity over centuries (Roychourdhry, 1964) [12].

Traditional knowledge exists worldwide in all communities covering varied areas including health, agriculture and natural resource management. In case of the developing world Africa and Latin America are also rich in traditional knowledge but they are to be found by and large only as oral traditions. Asia in general and India in particular have a distinction that traditional knowledge is found not just as oral tradition but also as classical literature that is written down with its own theoretical framework and with a clear exposition of the basic principles of world views (Trease, 1970) [15].

In most of the states leaves of Neem (*Azadirachta indica*), Nirgudi(*Vitex negundo*) Karanj (*Pongamia pinnata*) Supla (*Mundulea sericea*) Tun(*Toona ciliate*,) Teak (*Tectona grandis)* Young leaves of Komal (*Koelzell apadularia*) Bhang (*Cannabis sativa*) and MethoDodi (*Leptadenia reticulate*) have been used. In addition wood ash of some plants such as Babhul (*Acacia nilotica)*, Suru (*Casurina equisitifolia*) Mango (*Mangifera indica*), Tamarand (*Tamarindas indica*) are used. Some places powdered rhizome of sweet flag (*Acorus calamus*) or turmeric (*Curcuma longa*) is used to protect crops from pest attack (Kulkarni and Kumbhojkar, 1996) [6].

Mahadeokoli tribe from Maharashtra uses leaves of Kulith(*Dolicho suniflorus*) and Sag (*Tectona grandis*) as preservatives for seed storage (Kulkarni and Kumbhojkar, 2003) [7]. In Tamil Nadu paddy and sorghum grains are stored along with *Ipomoea fistulosa* which prevents pest attack Major store grain pests are rice moth, red flour beetle, pulse beetle and rice weevil are controlled effectively with tribal pesticides. The effective treatment included during with salt powder, kitchen ash vitex leaves powder, cow dung ash, turmeric powder and mixture of neem leaves, vitex leaves and turmeric powder.

One of the most important problems is protecting crops from insects. For the control of insects synthetic chemicals are continuously used and their toxicity endangers health of farm operators, animals and food consumers. The negative effects on human health led to a resurgence of interest in botanical insecticides due to their minimal costs and ecological side effects (Kulkarni *et.al.*, 2019) [8].

**'**Dashparni' word comprises of two different words 'Dasha' means ten and 'Parna' means leaves of plant. 'Ark' means juice/ crude extract. It is a natural pesticide which can be used on any crop, vegetables and fruit crops. It is a very powerful liquid pesticide prepared using all natural ingredients. It is useful against all types of pests and diseases observed in crop plants. Even for juice sucking insects such as aphids and jassids. It develops immunity in plants and also shows

antiviral, antibacterial and antifungal effect.

Dashparni ark is an excellent organic liquid bio-pesticide. Spraying rate of 125 ml. per 10 lit. of water for one pump spray. Use 2.5 lit solution of ark along with 200 lit of water per acre [11]. Spray of ark with 10 present concentration inhibited the growth of *Erysiphe* and *Sphaerotheca species* (Pawar and Chavan, 2010) [10].

Phytochemicals such as tannins shows strong activity against several plant pathogens and pest [9]. Saponin has insecticidal activity like repellent and deterrent activity (Ellen De Geyter, 2007) [2]. The use of plant compounds like essential oils, flavonoids, alkaloids, glycosides, esters and fatty acids having repellent effects.

These interesting plant groups of 10 different types have different chemical compounds and gives new dimension to crops protection in modern agriculture and horticulture with integrated pest management program.

## Materials and Methods

### Plant collection and identification

Collection of leaves from plant material like *Vitex negundo* L., *Carica papaya* L.,*Aegle marmelos* L., *Tinospora cordifolia* (Willd).Hook, *Calotropis gigantean* L., *Jatropha curcus* L., *Melia azedarach* L., *Nerium oleander* L., *Ipomoea fistulosa* L. and *Lantana camara* L.from different location of Kolhapur districts. These samples were free from disease. Plant materials were identified with stranded literature.

### Extraction of plant material

### Preparation of aqueous extracts

Samples were weighed using an electronic balance and 10 gm of plant material were crushed in 100 ml of distilled water and filter through muscline cloth. These samples are used for phytochemical analysis.

### Preliminary Phytochemical Analysis

The individual extracts were used for the qualitative phytochemical screening for the presence of some chemical constituents. Phytochemical test were carried out adopting standard procedure (Trease, 1970; Kokate *et.al.,* 1997) [16, 5].

### Test for Alkaloids

A quantity (3 ml) of concentrated extract was taken into test, cooled and filter, the filtrate was used for following test.

DragenDroff'sTest: 2 drops of Dragendroff's reagent were added to 1ml of the extract. The development of a creamy ppt was indicates that presence of alkaloids.

### Test for Saponin

5 ml extract was mixed with 20 ml of distilled water then agitated in the graduated cylinder, 15 min formation of foam indicates Saponin present.

### Test for Steroids

1 ml extract was dissolved in 10 ml of chloroform and equal volume of concentrated $H_2SO_4$ acid was added from the side of test tube. The upper layer turns red and $H_2SO_4$ layer showed yellow with green fluorescence. This indicates the presence of steroid.

### Test for Tannin

4ml of extract was treated with 4 ml $FeCl_3$ formation of green colour indicates that presence of condensed tannin.

### Test for Anthocyanin

2 ml of aqueous extract is added to 2 ml of 2N HCl and $NH_3$, the appearance of pink red turns blue violet indicates presence of the Anthocyanin.

### Test for Coumarin

3 ml of 10% of NaOH was the added to 2 ml of aqueous extract formation of yellow colour indicates the presence of Coumarins.

### Test for Proteins

Xanthoproteic Test: Extract was treated with few drops of concentrated $HNO_3$ formation of yellow colour indicates the presence of Proteins.

### Test for Amino Acid

NinhydrinTest: To the 2 ml of extract 2 ml on the Ninhydrin reangent was added and boil the for few minutes, formation of blue colour indicates the presence of the Amino Acid.

### Test for Flavonoids

Alkaline Reagent Test: Extract was treated with 10 % of NaOH solution, formation of intense yellow colour indicates the presence of the Flavonoids.

### Test for Phytosterol

Salkowski's Test: Extract was treated with chloroform and filtered. The filtered was treated with few drops of concentrated $H_2SO_4$ and shake, allow the standing appearance of golden red indicates the positive test.

### Test for Phenol

Ferric chloride Test: Test extract were treated with 4 drops of Alcoholic $FeCl_3$ solution. Formation of bluish black colour indicates the presence of Phenols.

### Test for Phlobatannins

Deposition of red ppt when aqueous extract of each plant sample is boiled with 10 % aqueous HCl was taken evidence of presence of the Phlobatannins.

### Test for Cardial Glycosides

**Killer-Killani Test:** Plant extract treated with glacial acetic acid containing a drop of $FeCl_3$. A brown coloured ring indicates the presence of the positive test.

### Test for Carbohydrates

Iodine Test: Take 2 ml of extract were treated with 5 drops of Iodine solution, gives blue colour, indicates the positive test.

**Benedict's Test:** Filtrate were treated with the Benedict's reagent and heated gently, orange red ppt indicates the presence of reducing sugar.

## Results and Discussion

**Table 1:** Phytochemical analysis of plants used in Dashparni ark

| Sr. No. | Phytochemicals | *Vitex negundo* L. | *Carica papaya* L. | *Aegle marmelos* L. | *Tinospora cordifolia* (Willd).Hook | *Calotropis gigantea* L. | *Jatropha curcus* L. |
|---|---|---|---|---|---|---|---|
| 1. | Alkaloids | - | - | - | - | - | + |
| 2. | Saponin | + | + | + | + | + | + |
| 3. | Steroid | + | + | + | - | + | + |
| 4. | Tannin | - | + | + | + | + | + |
| 5. | Anthrocyanin | - | - | - | - | - | - |
| 6. | Coumarin | + | - | + | - | - | + |
| 7. | Proteins | + | + | + | + | + | - |
| 8. | Amino Acids | - | + | - | + | - | - |
| 9. | Flavonoids | + | - | + | - | - | + |
| 10. | Phytosterol | + | + | + | - | + | + |
| 11. | Phenol | + | + | + | + | + | + |
| 12. | Phlabotannins | - | - | + | - | - | - |
| 13. | Cardial Glycosides | + | + | + | + | - | + |
| 14. | Carbohydrates | + | + | + | - | - | - |

Note: [(+)= Positive, (-)=Negative]

**Table 2:** Phytochemical analysis of plants used in Dashparni ark

| Sr. No. | Phytochemicals | *Melia azedarach* L. | *Nerium oleander* L. | *Ipomoea fistulosa* L. | *Lantana camara* L. | Dashparni Ark (Mixed) |
|---|---|---|---|---|---|---|
| 1. | Alkaloids | - | - | - | + | + |
| 2. | Saponin | + | + | + | + | - |
| 3. | Steroid | + | + | + | + | + |
| 4. | Tannin | + | + | - | - | + |
| 5. | Anthrocyanin | - | - | - | - | - |
| 6. | Coumarin | + | + | + | + | + |
| 7. | Proteins | + | + | + | + | + |
| 8. | Amino Acids | - | + | - | - | + |
| 9. | Flavonoids | + | + | + | + | + |
| 10. | Phytosterol | + | + | + | + | + |
| 11. | Phenol | + | + | + | + | + |
| 12. | Phlabotannins | - | - | - | - | + |
| 13. | Cardial Glycosides | - | - | + | + | + |
| 14. | Carbohydrates | + | - | - | + | + |

Note: [(+)= Positive, (-)=Negative]

The present study was carried out to investigate the phytochemical profile present in leaves of ten plants known as Dashparni ark. The fresh leaves of every plant was extracted with water. A number of biologically active compounds have been isolated from the plant. The compounds like saponin, proteins, phenol, steroid, phytosterolare present in all these plants and anthocyanin, phlobatannins are absent in all these plants. High concentrations of tannins helps to prevent fungal, bacterial decay and having insecticidal property (Schultz,1992) [14]. Phytochemicals such as tannins have been possess strong activities against several plant pathogens and pests (Mila, 1996)[9].Flavonoids and tannins was serve as defence mechanism against several microorganisms (Elmas,1999)[3]. Saponins shows activity like fungicide, bactericides, molluscicides and pesticides (Ellen, 2007) [2].

Dashparni ark the major components like alkaloids, steroid, tannin, coumarin, proteins, amino acids, flavonoid, phytosterol, phenol, cardial glycosides, carbohydrates are present and anthocyanin, phlobatannins are absent. The use of plant compounds like essential oils, flavonoids, alkaloids, glycosides and fatty acids shows repellent activity (Safia Zoubiri and Aoumeur Baaliouamer, 2012) [13]. Saponins was one of the major phytochemical shows insecticidal activity (Chaieb, 2010) [1]. Dashparni ark is an excellent organic liquid bio-pesticide (Raskar and Wani, 2014) [11].

## Conclusion

The presenceof phytochemicals in plant material shows usefulness for treating different diseases occurring in crops. These plant can be used in the pharmaceutical industries as well as in pesticide companies to avoid chemical pollution during spraying of products. These plants were used in the combination of different bio-pesticides. In modern agriculture like organic farming these bio-pesticides have great advantage due to its different properties. These botanical pesticides are easily available and due to its non residual effect they are commonly using by farmer for integrates pest management (Gupta and Goel, 2013) [4].

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