Biospectra : ISSN: 0973-7057, Vol. 20(1), March, 2025, pp. 189-194

An International Biannual Refereed Journal of Life Sciences

Plant Science

ISSN : 0973-7057

Evaluating the plant growth promoting potential of Dashparni Ark: a traditional ayurvedic formulation

Sulabha Lalsare*, Kalyani Gadakh, Nikita Jadhav & Madhuri Kare

Department of Botany, K. K. Wagh Arts, Science and Commerce College, Pimpalgaon, Nashik, Maharashtra, India

Received : 04th January, 2025 ; Revised : 08th February, 2025

DOI:-https://doi.org/10.5281/zenodo.16416672

Abstract- Dashparni Ark, a traditional Ayurvedic formulation, has been used for centuries in Indian medicine. Recent studies have explored its potential applications in agriculture. This study investigated the plant growth promoting potential of Dashparni Ark on *Solanum lycopersicum*. The formulation was evaluated for its effects on seed germination, root growth, shoot length, and biomass production. Our results show that Dashparni Ark significantly enhanced seed germination, root growth, and shoot length, resulting in increased biomass production. The formulation also exhibited antioxidant and anti-stress properties, suggesting its potential as a natural plant growth promoter. These findings provide evidence for the agricultural applications of Dashparni Ark and highlight its potential as a sustainable and eco-friendly alternative to synthetic plant growth regulators.

Keywords: Dashparni Ark, plant growth promotion, Ayurvedic formulation, sustainable agriculture, natural plant growth regulators

INTRODUCTION

Dashparni Ark is ayurvedic herbal preparation with medicinal qualities prepared from traditional herbal extract. It is used in agriculture because of its ability to improve plant development and provide protection against disease and pests. Dashparni Ark is a great organic liquid biopesticide which helps manage pests and diseases that affect crops. Dashparni ark's is prepared from extract of ten plants which contains alkaloids, flavonoids, saponins, and other important chemical components. Agriculture is an important part of the Indian economy. Rural households rely on agriculture to a greater extent than 70%. A key part of the Indian economy, agriculture employs more than 60% of the workforce and accounts for 17% of the country's GDP. Despite being a perennial herbaceous plant, tomatoes are frequently farmed as annual crops. Tomato (*Solanum lycopersicum* L.) is one of the most significant vegetable crops. It is a dietary source of antioxidants and ensures high supply of vitamins, minerals, and fibre. The tomato or *Solanum lycopersicum*, is one of the most widely grown and economically significant vegetables in the world. The tomato belongs to the Solanaceae family and has around 3000 species. The western coastal plain of South America is where the tomato first appeared. Fruit was originally domesticated in Mexico and was later brought to Europe. After potatoes, tomatoes are the second most eaten non-starchy vegetable in the world. Dashparni Ark is being studied for its possible usefulness as a natural insecticide and growth booster in agriculture. It is well known that Dashparni Ark has insecticidal qualities. It allows farmers to manage pests without using artificial pesticides. The mixture could improve plant yield and growth.

*Corresponding author :
Phone : 9881487858
E-mail : sulabhalalsare@gmail.com

MATERIALS & METHODS

Neem – *Azadirachta indica,* Sitapal - *Annona squamosa,* Papaya – *Carica papaya,* Gulvel - *Tinospora cordifolia,* Kaner -*Nerium indicum,* Karanj - *Pongamia pinnta,* Datura- *Datura stramonium*, Yerand – *Ricinus communis,* Tulsi – *Ocimum sanctum,* Adulsa –*Adhatoda vasica,* Cow Dung – 2 kg Cow Urine – 2 liter, Water 50 liter

1. Neem- *Azadirachta indica* belongs to family Meliaceae. In India, neem (*Azadirachta indica*) is a huge tree. In Asia, it has been used for millennia as a fungicide and pesticide. Nearly every element of neem is beneficial. Neem's significance is growing globally as a result of its advantageous qualities. Because of its enormous potential for use in medicine, environmental protection, and pest management, neem is regarded as one of the most promising trees of the twenty-first century. For this reason, the International Scientific Community named Nem in ten plants to be researched and utilized for the sustainable growth and development of plants. One of the primary ingredients used to make the biopesticides is neem. Extracts from neem have insecticidal effects. It is applied as a foliar spray because of its antibacterial qualities, which help shield plants from various pests.

2. Sitaphal- *Annona squamosa* belongs to family Annonaceae. It has been shown through the writings of several researchers that every portion of *A. squamosa* has therapeutic value. It is a part of Bangladesh's traditional medical system. This plant's extracts have demonstrated potential for controlling a variety of insect pests. Insecticides can be made from the leaves and seeds of the custord apple, also called sitaphal. It is possible to employ sitaphal leaf ethanolic preparations as insect contact poison. Custard apple seeds can be used as insecticides since they are bitter and poisonous. In addition to their insecticidal qualities, the seeds also have antibacterial and anti-inflammatory qualities. It is possible to utilize seeds as a natural insecticide. The seeds of custard apples contain strong antifungal qualities. As a pesticide, custard apple seed oil prevents insects from eating and deters pests including caterpillars, aphids, beetles, grasshoppers, and plant hoppers. As a contact toxin for insects, Annona squamosa extracts can enter the body wall and tracheal system and cause death.

3. Papaya – *Papaya carica* belongs to family Caricaceae. The Caricaceae family includes carica papaya. Numerous Caricaceae plants have been utilized as remedies for a range of illnesses. Bacterial infections have been treated with the latex from leaves. Natural substances with strong anticancer and pesticidal effects are produced by Carica papaya plants in their leaf bark and twig tissues. Papaya leaves have insect-repelling properties. Aphids and caterpillars are among the insects which can be managed by papaya leaves. Papaya leaf insecticides may be made using the same method as neem leaf pesticides. Papaya leaf ethanolic extracts can be used as a natural pesticide to keep German cockroaches away. The extract works really well against every German cockroach population. Insects dislike the bitter taste and odor of the alkaloids found in papaya leaves. Extracts from papaya leaves have the ability to kill mosquitoes by attracting them to a cage.

4. Gulvel- *Tinospora cordifolia* belongs to family Menispermaceae. *T. cordifolia* is referred to in Ayurveda as "rasayana," which means "circulation of rasa," a nutrient, in Sanskrit. This rasayana was characterized by the ancient Indian physician as anti-aging, extending life, enhancing intelligence, enhancing memory, and preventing illness. Guduchi sattva is well regarded for treating a variety of illnesses, fevers, jaundice, burning sensations, persistent diarrhoea, persistent dysentery, and urinary problems.

5. Kaner- *Nerium indicum* belongs to family Apocynaceae. It possesses antibacterial and antitumor properties. Nerium indicum extracts in methanol, chloroform, and hexane have demonstrated strong antibacterial action and inhibit microbial growth. Kaner leaves have insecticidal properties. Ethanolic extracts of Kaner leaves have antibacterial properties against Staphylococcus aureus and E. coli. The mosquito population can be managed by using the hydroethanolic extracts of Kaner leaves.

6. Karanj- *Pongamia pinnata* belongs to family Fabaceae. The plant is utilized as a folk remedy, especially in the Indian medical systems of Ayurveda and Siddha which contains alkaloids, tannins, and carbohydrates. It is used to treat skin conditions, ulcers, tumors, diarrhoea, and bronchitis. The dried leaves of karanj tree, sometimes called as pongam tree may be used as an insect repellent. It can aid in the development of plants and be used as an acaricide and pesticide.

7. Datura - *Datura stramonium* belongs to family Solanaceae. Insecticides are made from Datura leaf extracts. Depending on the extract's dosage and exposure time,

extracts from Datura species can kill a variety of insects. Two-spotted spider mites can be controlled with ethanol extracts from Datura seeds and leaves. In integrated pest management, Datura extracts can be utilized as environmentally friendly substitutes.

8. Castor leaves- ***Ricinus communis*** belongs to family Euphorbiacae. leaves, have insecticidal properties. Compounds found in erand leaves have the potential to be harmful to insects. According to a study, Spodoptera frugiperda were poisoned by palmitic acid, the primary ingredient in a castor leaf extract. Phytochemicals found in castor leaves, such as glycosides, alkaloids, flavonoids, steroids, and saponins, can aid with mosquito control. In ancient times, castor oil and the plant's roots and leaves were utilized as a mosquito larvicide. The herb has purgative, stimulants, antimicrobials, and anti-inflammatory properties.

9. Tulsi- ***Ocimum sanctum*** belongs to family Lamiaceae, which is also commonly referred as mint family. Native to tropical and subtropical parts of Asia and Australia, tulsi is a blooming plant with fragrant leaves. Tulsi is frequently used as a herbal tea in Ayurvedic and traditional medicine. It's a culinary herb as well. A volatile oil found in tulsi leaves deters microorganisms and insects. One may use tulsi leaves to keep insects away. Boiling tulsi leaves produces a liquid that may be used as insect repellent.

10. Adulsa - ***Adhatoda vasica*** belongs to family Acanthaceae. It has led to the collection of 233 compounds of different types such as alkaloids, flavonoids, essential oils, terpenoids, fatty acids, phenols, etc. It is a promising source of potential phyto pharmaceutical agent that exhibits diverse pharmacological activities, including antibacterial, antifungal, hepatoprotective, anti-ulcer, abortifacient, antiviral, anti-inflammatory, thrombolytic, hypoglycemic, anti-tubercular, antioxidant, and antitussive activities.

Cow Dung and Cow Urine:- According to Veda, cows are the most precious animals and are referred to be the mother of all. Cow products including dung, urine, milk, ghee, and curd are particularly beneficial and are utilized in many Ayurvedic formulations. These five cow-derived items are referred to as panchgavya. Many herbal, animal, and mineral-based medications contain these panchgavya ingredients, either separately or in combination. Products made from panchgavya also produce good results in a variety of agricultural applications, such as biopesticides, vermi compost, and fertilizers, which are used to increase soil fertility and produce disease-free plants. One of the constituents of panchgavya, cow urine, is said to provide medicinal benefits. In practically every state in India, the bulk of the rural populace uses cow urine as a traditional cure. A prominent element in Dashparni Ark preparation is cow urine. Because cow dung has a bigger microbial population and a higher concentration of nutrients, it has been demonstrated to be useful for bioremediation of several pesticides. Additionally, cow excrement contains an antifungal component that has antifungal action and increases their activity.

Collection of Plant Material

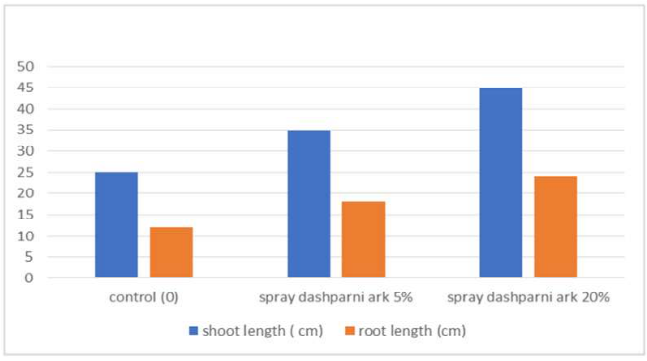
Methodology: - Fill a tank with fifty liters of water, and then add two kilograms of leaves from each of the 10 plant species listed (200 grams of each plant). Either crush all of the leaf material or soak it in water. Then, using a wooden stirrer, thoroughly mix the two liters of cow urine and two kilograms of cow manure with the submerged leaves. The produced mixture should be left for five days. On the sixth day, add five to seven liters of water to the mixture and thoroughly mix all the contents in the tank. Keep this mixture for a month, stirring it every day to encourage fermentation. After the allotted time, filter this

mixture using muslin cloth to filter the mixture after the fermentation phase to extract the liquid part. The filter liquid (ark) was kept in sterile bottles. If stored in a cold, dark location, it can be used for several months. Foliar spray application: Combine the 125 mL Dashparni ark with one liter of water.

Spray Dashparni Ark in different concentrations:

Observation Table 1:

Concentrations	Plant height	Root length
Control (0%)	25 cm	12 cm
Spray dashparni Ark (5%)	35 cm	18 cm
Spray dashparni Ark (20%)	45 cm	24 cm



RESULT

Dashparni Ark is a traditional herbal preparation used in agriculture, particularly in organic farming. It is made from a combination of ten medicinal plants, In this experimental study Dashparni Ark enhanced soil fertility, promoted plant growth, and showed improved resistance to pests and diseases. This can be utilized in different concertation to achieve desirable growth of various plants

CONCLUSION

The preparation of Dashparni Ark for pest control involves utilizing the extract from the ten medicinal plants known for their insect – repelling properties. This herbal formulation can serve as natural pesticides, effectively managing pests without the harmful effects of synthetic chemicals. The preparation process includes crushing the leaves in water and mixing them with cow urine and cow dunk and is kept in dark for a specified period followed by filtration to collect liquid extract. The application of Dashparni Ark can help protect plants from various pests, promoting a healthier and more sustainable approach to pest management. Dashparni ARK is bioproduct of plant and animal waste that can act as a natural alternative to chemical pesticide. The preparation of Dashparni Ark plays a crucial role in sustainable agricultural practices. This herbal extract is derived from a combination of ten medicinal plants, known for their pest repellent and growth promoting properties. Once prepared Dashparni Ark serves multiple purposes in organic farming, offering both pest control and nutritional benefits. It acts as a natural insecticide, reducing the reliance on chemical pesticides, which can harm beneficial organisms and compromise soil health. It enhances plant growth and leading to improve crop yields and quality. Incorporating Dashparni Ark into agricultural practices not only supports environmental sustainability but also promotes the health of ecosystem. Overall, the preparation and application of Dashparni Ark exemplify how traditional knowledge and modern agriculture can work together to create a more sustainable farming future.

REFERENCES

1. **S. Zoubiri, A. Baaliouamer. 2012.** Chemical composition and insecticidal properties of *Lantana camara* L. leaf essential oils from Algeria. *Journal of essential oil research,* **24(4):**377-383.

2. **Swaminathan M. S. 1996.** Inaugural Address-Ethnobiology in Human Welfare. (Ed. S. K. Jain) Deep publisher, New Delhi, 1-7.

3. **Ellen De Geyter. 2007.** Novel advances with plant saponins as natural insecticides to control plant pest insects, Pest Technology, Global science book, 1-10.

4. **Raskar, S. S. and Wani, A. G. 2014.** Promotion of organic farming in tribal farmers of Akole with relation to climate change. *International Journal of Current Research.* **6(01):** 4697-4701

5. **D. J. Allen. 2013.** Evaluation of antifungal activity of plant extracts against Papaya anthracnose (*Colletotrichum gloeosporioides*), *Journal of Plant Pathology & Microbiology,* **4(10)**

6. **D. J. Allen. 1984.** The Pathology of Tropical Food Legumes: Disease Resistance in Crop Improvement.

7. **Rahmah A. N. & Mostafa A.A. 2013.** Fungicidal activities of certain methanolic plant extracts against tomato phytopathogenic fungi. **7(6):** 517-524.

8. **Ashlesha J. S., Sugha S. K., 2010.** Cow dung preparations in the management of *Rhizoctonia solani., Plant Dis. Res.,* **24:** 30-33.

9. **Ayoola P. B. & Adeyeye A. 2010.** Phytochemical and nutrient evaluation of *Carica papaya* (pawpaw) leave., *Int. J. River Res. Appl.,* **3:** 1- 5.

10. **Begum N., Sharma B. and Pandey R. S. 2013.** *Calotropis procera* and *Annona squamosa:* Potential Alternatives to Chemical Pesticides., *British J. Appl. Sci.& Tech.,*

11. **Bhaskaran R. and Kandaswamy T. K. 978.** Production of a toxic metabolite by *Alternaria helianthi in vitro* and *in vivo*., *Madras Agri. J.,* **65:** 801-804.

12. **Biswas K., Chattopadhyay I., Banerjee R. K., and Bandyopadhyay U. 2002.** Biological activities and medicinal properties of neem (*Azadirachta indica*), *Cur. Sci.,* **82:** 1336-1 345.

13. **Biswas K., Chattopadhyay I., Banerjee Bourgaud F., Gravot AMilesi V. S. and Gontier E. 2001.** Production of plant secondary metabolites: A historical perspective., *Plant Sci.,* **161:** 839-851.

14. **Brandes G. A. 1953.** The history and development of the ethylene bisdithio carbamate fungicides., *Am. Potato J.,* **30:** 137.

15. **Britto A. D. J., Gracelin S. H. D. and Sebastian S. R. 2011.** Antibacterial activity ofa few medicinal plants against *Xanthomonas campestris* and *Aeromonas hydrophila., J. Biopest.*, **4(1):** 57-60.

16. **A. Chittaragi, Raja N. Thejashwi C. S. and Mahesh K., Dec 2013.** Phytochemical and antifungal activity of *Hygrocybe parvula* (Peck)., *Int. J. Pharm. Biological. Sci.,* **3(4):** 62-71.

17. **Dorman H. J. D. and Deans S. G. 2000.** Antimicrobial agents from plants: antibacterial activity of plant volatile oils., *J. App. Microbio*, **88:** 308-316.

18. **Doughari J. H., Elmahmood A. M. and Manzara S. 2007.** Studies on the antimicrobial activity of root extract of *Carica papaya.,* L. *J. Microbiol. Res.* 037-041.

***