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MODERN ASPECTS OF PANCHAGAVYA IN PLANT PROTECTION

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ABSTRACT

In India, Panchagavya is an organic blend of five or more cow-derived components used in Hindu rituals and agriculture. This biofertilizer and plant growth enhancer is made from five cow products, with "Panchagavya" meaning "five cow derivatives" in Sanskrit. Valued in sustainable agriculture, Panchagavya enhances plant health, soil fertility, and protection methods. It also boosts immunity in animals by promoting antibody production and is used to increase appetite, heal wounds, and treat conditions like psoriasis in humans. This article explores the modern uses of Panchagavya in pest and disease management.

KEYWORDS: Insect, Pests, Disease management, Panchagavya, Plant protection

INTRODUCTION

In Ayurveda and conventional Indian beneficial procedures, panchgavya—which refers to milk, urinates, dung, ghee, and curd—has a crucial medicinal role. The practice of Panchgavya is known as "Cowpathy" in Ayurveda. The cow is revered as a divinity in India, where it is known as "Gaumata," signifying its maternal qualities. By encouraging soil fertility, earthworm development, shielding crops from bacterial as well as fungal diseases, and other benefits, panchgavya may also return some of that fertility to the environment. Numerous advantageous microorganisms, including Lactobacillus, Bacillus, Saccharomyces, Candida, Streptococcus, and some others, are abundant in cow faeces. It also includes a variety of nutritional elements, including cellulose, hemicellulose, mucus, lignin, potassium, nitrogen, oxygen, and vitamins. "Gomutra," or cow urine, is a non-toxic waste water that comes out from the cow. It is well recognised that cow urine, or its distillate, has several health benefits that can extend survival rates as well as improve the quality of life in patients with serious diseases.

PREPARATION OF PANCHAGAVYA

Although panchgavya is easily available in the Indian market, we choose to manufacture our own. This is due to the fact that panchagavya is quite simple to prepare, additionally to our need to maintain quality control. The quantity of various inputs are given in Table 1.

Table 1: Quantity of various inputs used for the preparation of panchagavya

Item	Quantity required
Cow Urine (Doesn't require fresh urine)	3 Liter
Cow Ghee	500 gm
Fresh cow dung	5 kg
Cow milk	2 Liter
Fresh Cow Curd	2 Liter
New prepared coconut water	3 Liter
Fresh grapes juice	2 Liter
Blackish organic jaggery	500 gm
Good ripening bananas	13 pcs
Water	3-4 Liter

METHOD FOR USING PANCHAGAVYA

Panchagavya can be applied as a liquid fertilizer by diluting it with thirty parts water. Using a piece of cotton to filter the liquid and remove waste, you can use it to formulate a foliar spray. It will clog your spray nozzle if you don't filter it. When a plant is growing normally, we apply it as fertilizer once every two weeks; during flowering and fruiting, we use it once a week. We use it once a week as a foliar spray. We've found that after applying Panchagaya, all pests vanish and then begin to reappear after roughly a week. We therefore spray once a week. It is best to spray in the early or late hours of the day. On an average day, we may apply it in the morning between 8 and 9 AM. About a half-hour before sundown in the evening spray. Rainy days are not the time to waste your Panchagavya.

BIOCHEMICAL PROPERTIES OF PANCHAGAVYA

In addition to total reducing sugars (glucose), panchagavya also contains macronutrients (N, K, P, Ca and Mg) and micronutrients (Fe, Zn, Cu, and Mn). The ammonia intake and overall N supply were enhanced by the chemolithotrophs and autotrophic nitrifiers (nitrifiers and ammonifiers) found in panchagavya, which colonize the leaves. After 30 days of fermentation, the pH of panchagavya dropped to 4.52, possibly as a result of the Lactobacillus bacteria in the panchagavya producing more organic acids during the fermentation process. The quantity of various growth hormones in panchagavya is given in Table 2.

Table 2. Quantity of various growth hormones in panchgavya

Sl. NO	Property	Range
1	Butyrate (%)	6.40- 7.75
2	IAA(ppm)	8.5
3	GA(ppm)	3.5
4	Propionate(%)	14.39- 17.79
5	Acetate(%)	60.05- 68.28

TRADITIONAL KNOWLEDGE REGARDING THE ABILITY IMPACTS OF PANCHAGAVYA ON PLANT DEVELOPMENT

- SUPPLY OF NUTRIENT: In addition to micronutrients, panchagavya contains a variety of nutrients, such as potassium, phosphorus, and nitrogen. Plants can absorb these nutrients, which encourages the growth and development of plants.
- MICROBIAL ACTIVITY: Certain beneficial bacteria found in panchagavya can increase the diversity of microbes in the soil, aid in nutrient metabolism, and increase the availability of important nutrients for plants.
- STRESS TOLERANCE: Scientists assert that panchagavya, which is frequently sprayed on leaves, can aid plants in enduring environmental stressors such as heat, drought, and pests.
- REDUCE ENVIRONMENTAL HAZARD: The usage of panchagavya is frequently linked to organic agricultural methods, which try to reduce the dependency on artificial fertilisers and chemicals. This might improve the general sustainability and health of plants.
- EFFECT ON FERTILITY OF SOIL: Because it functions as organic manure, panchagavya plays a significant role in improving soil fertility status. It also increases plants' capacity to hold water and has been shown to increase nutrient uptake. However, it's essential to note that there is limited scientific research on the effects of panchagavya and that the results can differ based on many factors, including crop variety, soil type, and application techniques.

APPLICATION OF PANCHAGAVYA IN INSECT PEST MANAGEMENT

We can use panchagavya in various plant protection approaches. We can use it against many insect pests, fungal and bacterial diseases. It also works as a botanical insecticide. It does not leave any residue on food or in the environment; they only kill the target insects (Mandal,2024).

- ✓ In addition to providing resistance against numerous sucking pests, yearly applications of Panchagavya increased the stick output in Moringa plants.
- ✓ Panchagavya showed efficacy power against *Bemisia tabaci* (White fly) and *Amrasca biguttula biguttula* (jassid) in okra (Boomirajet al. 2004).
- ✓ It is also a powerful insect repellent. It is very successful in reducing the threat posed by fruit flies from fruit and vegetable crops.
- ✓ According to research by Mudigora et al. (2009), Panchagavya + cow faeces mixed with neem seed kernel extract(NSKE) worked well in suppressing *Atherigona soccata*. NSKE works as an insect repellent.
- ✓ Under laboratory circumstances, the combination of 3% neem oil and 3% Panchagavya showed the highest mortality rate for *Spodoptera litura*.

PANCHAGAVYA USED AS PLANT DISEASE MANAGEMENT:

Panchagavya is one of the most important organic amendments that are used as quick fertilizers and pesticides in crop cultivation. It is effectively used as an organic supplement in plant disease management mainly soil-borne pathogens to improve the agricultural and horticultural crop yields, establishment and soil health as eco-friendly. Because it depletes the nutrients as saprophytes and starvation of the pathogens. Composted cow dung enhances plant growth and is high in total nitrogen (0.74%), which includes some hormones (Dhama et al., 2005). The rice bacterial blight disease was also found to be effectively controlled by cow dung extract spray, outperforming Penicillin, Pausha Mycin, and Streptomycin. It was discovered that cow dung when utilized as organic manure, increased plant vigour and decreased the occurrence of *Phymatotrichum omnivorum*-caused root rots in cotton. A destructive fungus called damping-off affects seeds and seedlings in both field and nursery conditions. The ability of panchagavya to prevent the growth of two soil-borne diseases, namely *Sclerotium rolfsii Sacc., Phytophthora colocasiae and Fusarium solani* (Rathore and Patil, 2019). Panchagavya is known to have antifungal properties against major soil-borne pathogens, including *Fusariumsolani f. sp. pisi, F. oxysporum f. sp. pisi, Rhizoctoniasolani, SclerotiumrolfsiiSacc, Sclerotiumsclerotiorum*. The researcher reported that 90% inhibition was observed in *F. oxysporum f. sp. pisi* and *F. solani f. sp. pisi*, and 100% in *S. rolfsii*, *S. sclerotiorum*, and *R. solani* (Kumar et al., 2020). Thus, an appropriate and sustainable method of applying panchagavya can increase output productivity while reducing the risk of disease infection.

CONCLUSION

In the past agricultural growth prioritized short-term production through the use of outside inputs, which led to a disregard for and inappropriate use of local resources. The primary aspect of panchagavya is its ability to effectively recover all crop output levels when the land is transformed from an inorganic to an organic cultural system starting in the first year. The use of Panchagavya in pest and disease management should be increased. The percentage of increasing yield is the main factor for any farmer and panchagavya does it properly.

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