PRODUCTION OF PANCHAGAVYA AND ITS EFFECT ON ALLIUM SEPA

(PROJECT – REPORT)

Submitted in partial fulfilment of the requirements for the award of

bachelor of science degree in biotechnology

by

KEERTHANA.S(38770009)

DEPARTMENT OF BIOTECHNOLOGY

SCHOOL OF BIO AND CHEMICAL ENGINEERING

SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

Accredited with grade 'A' by NAAC

JEPIAAR NAGAR,RAJIV GANDHI

SALAI,CHENNAI – 600119

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SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

Accredited with “A” grade by NAAC

Jeppiaar Nagar, Rajiv Gandhi Salai, Chennai – 600 119

www.sathyabama.ac.in

DEPARTMENT OF BIOTECHNOLOGY

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **KEERTHANA.S (38770009)** and who carried out the project entitled “**PRODUCTION OF PANCHAGAVYA AND ITS EFFECT ON ALLIUM SEPA”** under our supervision from October 2020 to March 2021.

(Prakash.P)

Internal Guide
Dr. P. Prakash

Head of the Department
Dr. V Ramesh Kumar

Submitted for Viva voce Examination held on ____________ .

Internal Examiner

Examiner **External**

DECLARATION

I **KEERTHANA.S (38770009)** hereby declare that the project report entitled ***"*PRODUCTION OF PANCHAGAVYA AND ITS EFFECT ON ALLIUM SEPA *"*** done by me under the guidance of **Dr. P. PRAKASH** at **Sathyabama institute of Science and Technology, Chennai** is submitted in partial fulfilment of the requirements for the award of Bachelor of science degree in Biotechnology.

DATE:

S. Keerthana

PLACE: chennai SIGNATURE OF THE CANDIDATE

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ABSTRACT

Panchagavya is an organic product produced by using five different by-products of cow like cow dung , cow urine , cow milk , ghee , curd and other ingredients .It has the potential to play the role of promoting growth and providing immunity in plant system by confers resistant against pest and disease . panchagavya contains several nutrients like N ,P,K and micronutrients which are required for the growth and development of plant and also contains various amino acids , vitamins ,growth regulators like auxin , gibberellins and also beneficial micro organisms like pseudomonas ,Azobacter and phosphor bacteria etc . The present study is to investigate the effect of various concentration of panchagavya on Allium sepa. Among the concentration 75% of Panchagavya given significant growth rate.

KEYWORDS: Panchgavya, cow urine, milk, dung, ghee, curd.

LIST OF ABBREVIATION AND SYMBOL :

gms – grams

ml – milli litre

cm – centimetre

% - percentage

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CHAPTER 1 : INTRODUCTION

1.1 PANCHAGAVYA

Panchagavya is an organic product having the potential to play the role of promoting growth and providing immunity in plant system.Panchagavya consists of nine products they are cow dung,cow urine, milk,curd,jaggery,ghee, banana,tender coconut water.When suitably mixed and used, these have miraculous effects.

Panchgavya has many beneficial implications in agriculture, organic farming as good quality natural manure and biopesticides, as alternate energy resources and high medicinal values. Bio-fertilizer and pest repellants obtained from cow urine and dung restores micro-nutrients and fertility of the soil and provides food free from health hazards of chemical fertilizers and pesticides. No other fertilizer in the world is as cheap and harmless as dung fertilizer. Dung and urine also provide valuable alternate source of energy in the form of biogas, fuel and electricity. 1Division of Avian Diseases, 2Centre for Animal Disease Research and Diagnosis, 3Veterinary Officer, Central Avian Research Institute, Izatnagar– 243 122 (UP), India www.ijcs.coz.in www.IndianJournals.com Members Copy, Not for Commercial Sale Downloaded From IP - 14.139.62.136 on dated 28-Aug-2012 Scientists/clinicians are facing problems in modern allopathic treatment due to the multiple drug resistance in microorganisms, presence of antibiotic residues in food chain and/or associated allergies and autoimmune disorders in man and animals. Immunity is reducing drastically as a result of the environmental pollution, use of agrochemicals in agriculture and presence of pesticides, heavy metals, fungal toxins etc. in the food chain.

1.2 COW DUNG: Cow dung has been considered as a Gold Mine due its wide applications in the field of agriculture, energy resource, environmental protection and therapeutic applications.

1.3 COW URINE:

Cow urine has many beneficial properties particularly in the areas of agriculture and therapeutics. It has also been observed during the scientific research that the urine of Indian cows is highly effective and interestingly almost nil or few medicinal properties are present in the urine of crossbred, exotic cows, buffaloes, etc. Recent researches showed that cow urine enhances the immune status of an individual through activating the macrophages and augmenting their engulfment power as well as bactericidal activity.

1.4 COW MILK :

According to Hindu mythology as well as the Indian traditional medical practices (both the classical systems like Ayurveda and Siddha and the oral practices of the rural villagers) cow milk has rejuvenatory health protecting and health promoting properties and hence has been said as the best one among vitalisers. The cow milk is a healthy food because of low calorie, low cholesterol and high micro-nutrients/vitamins. Compared to buffalo milk it has high moisture, carotene, thiamine, riboflavin, vitamin C, sodium potassium; and on other hand is low in protein, energy (kilocalories), calcium, phosphorous, fat and cholesterol. These properties serve unique purposes. Buffalo milk may be richer but it is the cow milk that sharpens intellect, gives swiftness of body, stability of emotions and a serene nature to the one who drinks it. Cow milk is an integral part of balanced diet (Gopalan et al., 1993; Nautiyal, 2002; Singh and Agarwal, 2004; Cow Milk is Amrit": A publication of the Love 4 Cow Trust). Cow milk is beneficial because Nutritious: Cows milk contains substances like carotenes, vitamin A, vitamins of B complex group and vitamin C. It also contains substances like flavones, sterols and phenols. All these chemical agents delay the processes involved in aging. It is known that the fatty acids and amino acids present in the fat of cow milk are different than those in buffalo milk. These components render cow milk very nutritious and growth promoting for infants and children. The use of milk proteins as nutritional supplements to enhance dietary protein quality is very feasible as they can provide lysine and tryptophan, the limiting amino acids of wheat and maize proteins. A 250 ml serving of cow milk contains riboflavin equivalent to 50% of the daily requirement of a pre-school child. Bio-Protective Role in Human Health: Milk plays an important role in meeting the requirements of many essential nutrients, and hence milk is considered as a protective food. The proteins of milk are of a high biological value. The digestibility of milk proteins is rated higher (96%) then that of plant proteins (74-78%). It is easily digestible, the amino acids composition makes its protein easily digestible, and reaching the nerves of the brain it acts as a brain tonic and is good for kidney. Lactose favors the absorption of calcium and phosphorous and the synthesis of some B complex vitamins in the small intestine. The lactic acid bacilli present in milk are important. Lactose, the principal milk sugar, promotes the growth of lactic acid producing bacteria in intestine thus creates a desirable condition that inhibits the growth of proteolytic and putrefying bacteria in the intestine and may increase the solubilization and absorption of calcium. Lactose also promotes the utilization of magnesium and phosphorus The milk proteins are useful in the diet of patients suffering from liver and gall bladder diseases, hyperlipidaemia and diabetes. The easy digestibility of milk fat makes it a valuable dietary constituent in diseases of stomach, intestine, liver, gall bladder, kidney and disorders of fat digestion. Milk fat is reported to have antibacterial and fungicidal activity against gram negative bacteria and certain moulds. Milk fat has a protective effect against human tooth decay ascribed in part to adsorption of milk fat onto the enamel surface and in part to antimicrobial effect of milk fatty acids. Kidney disorders: The low content of protein in cows milk from buffalo milk makes it ideal for infants and people with renal disorders. Patients with impaired kidney functions rely on protein with high biological value for relieving strain on the excretory function of the kidney. Immunity: It is a rich source of vitamins like B2 , B3 and vitamin A which help increasing immunity. It is a good source of zinc, which is required for synthesis of insulin by the pancreas and for immunity function. The substances in milk which have an antimicrobial effect are immunoglobulins, lactoferrin, lysozyme, lactoperoxidase and vitamin B12-binding protein. The immunoglobulins, mainly IgA are not broken down by the digestive enzymes. Thus, they not only act against the microorganisms in the intestine but also prevent the absorption of foreign proteins. Lactoferrin is an iron binding glycoprotein that occurs in cow milk at a level of 0.2 mg/ml. A number of milk enzymes viz. lactoperoxidase, xanthin oxidase and lysozyme are involved in antibacterial mechanisms. Several peptides with opium like (sleep inducing) activity have been extracted from the degradation products of milk proteins viz. ß-casomorphins (from ß-casein), exorphin (from µS1 casein), ß-lactostensin (from lactoglobulin) and serorphin (from serum albumin) which can prolong gastrointestinal transit time exerting anti-diarrhoeal effect. Certain peptides from casein stimulate the production of immunoglobulins. Immune-stimulatory Cowpathy: an overview 7 www.IndianJournals.com Members Copy, Not for Commercial Sale Downloaded From IP - 14.139.62.136 on dated 28-Aug-2012 peptides from milk can stimulate the phagocytic activities of murine and human macrophages and enhance resistance against certain bacteria. Vision: Its yellow substance “Carotene” (Vitamin A) increases the visual strength. Vitamin A deficiency is a major cause of widespread blindness among children in India. A 250 ml serving of cow milk contain vitamin A sufficient to meet 75% daily vitamin A requirement of pre-school child.

1.5 COW CURD :

(DAHI) Cow Curd (dahi) or Matha (whey or butter milk) prepared from indigenous cow is milk is considered as digestive, nutritive and useful in gastrointestinal ailments by checking or controlling the growth of harmful organism. Curd from cow milk is considered “Vatanashak” and blood purifier. If it is taken with sugar, it is useful in “Pitta” induced disorders and cures the blood related problems. Whey of cow (Butter milk) is known as “Tridoshnashak” and found useful in piles and other gastrointestinal disorders. (Singh and Chauhan, 2004). Since ancient times curd has been used either with sugar (powdered sugar) or with black salt and zira. People take whey after food for good digestion. Whey/ butter milk is very low in fat but has large amount of beneficial bacteria or their breakthrough products in the form of amino acids, peptides, vitamins, minerals etc., which are nutritionally useful in human and animal health. These bacteria attach on the intestinal surface and further multiply there. Lactobacillus acidophilus bacteria plays vital role, making the whey more useful.

1.6 COW GHEE :

(BUTTER-FAT) • Cow ghee (butter-fat) is traditionally believed to improve memory, voice, vision, intelligence and body's resistance to infections. • It exhibits antichollestric activity, and immunostimulant activity. • Ayurvedic practitioners believe that cow's milk and ghee are memory enhancers. • Cow ghee is helpful for eye sight and improves digestion. It is 'Tridosh Nashak', energetic, brain tonic, tonic, fragrant, madhuri, cold and over all the best of the 'ghee' (butter milk). It has antiageing factors. • A formulation containing cow ghee, honey, vitamins and a non-fat fraction of cow milk is being attempted as a micronutrient. • The modern doctors recommend not to use any fat except cow ghee by a cholesterol patient. The use of cow ghee does not increase cholesterol and has no bad effect on heart. • Cow butter is a blood purifier and increases the beauty. • Cow ghee promotes healing of wounds. • It is helpful in preventing and controlling paralysis and asthma. • The ghee obtained from cow milk is very much useful for persons having weak eyesight. • Cow ghee as well as urine has been seen to stimulate immune processes in experimental animals. • Ghee as a Suppository Base: Cow ghee, in combination with some other bases, has been seen to serve as an excellent material for preparation of suppositories. • A Panchgavya Ayurvedic formulation containing E. officinalis, G. glabra, and cow ghee have been evaluated for its effect on pentobarbital-induced sleeping time, pentylenetetrazol-induced seizures, maximal electroshock-induced seizures, spontaneous motor activity, rota-rod performance (motor coordination) and antagonism to amphetamine in mice. The formulation did not show neurotoxicity. The results suggest that the Panchgavya formulation is sedative in nature. • 10 gms of cow ghee used in fire sacrifice produces one ton of oxygen. When cow ghee is burned with rice it produces Etholine oxide, propylene oxide, ethelene oxide and formaldehyde, which give immunity against bacteria, which are used in operation theatre. Propylene oxide induces rain. • Cow ghee has immense power to protect human body from the ill effect of radioactive waves thus can save the environment from atomic radiation. Fulzele et al. (2001, 2003) demonstrated the immunostimulant potential of cow ghee in Panchgavya formulations, as indicated by increase in neutrophil adhesion, haemagglutination (HA) titre and delayed type hypersensitivity (DTH) responses in rats. Achliya et al. (2004) suggested that the panchagavya Ayurvedic formulation containing E. officinalis, G. glabra, and cow's ghee is sedative in nature.

1.7 MICROBES IN PANCHAGAVYA :

1.Phosphobacteria

2.Azospirillum

3.Pseudomonas

4.Azobacter

5.Lactobacillus

CHAPTER 2 REVIEW OF LITERATURE :

K Dhama (2005) Cow is Central to our life and bio-diversity. Its progeny and its Panchgavya have wide applications and have the potential for sustainable agriculture production, health and nutrition of humans, production of biofertilizers, production of non-conventional energy and for maintaining the bio-diversity of the ecosystem. The area has tremendous potential which has not been exploited. By the use of chemical fertilizers, pesticides and exploitation of ground water the food grain production levels have been obtained at a higher cost but at the cost of the fertility and health of soil and also the quality of the food produced. The only remedy to restore the balance is organic farming and the cow and its progeny and other animals could provide the solution. The rearing of cow and its progeny is a viable alternative for removing poverty in the rural and semi-urban areas and providing employment opportunities for a long term sustainable economic growth. The knowledge about cow's contribution to the economy, medicinal and scientific value of Panchgavya is not known by all besides the non-availability of the labeled cowpathy products. By following the future strategies/measures, the tremendous cattle wealth of the country can be propagated in its proper perspective. Therefore, efforts need to be made for public awareness about the "virtues of cow" and its "Panchgavya". Now people need information and data based on research. Most of the tested practices of cow therapy, Panchgavya, Agnihotra and milk miracles are rejected as myth or mythological adventures. It is therefore necessary to blend science, spirituality and wisdom. Such a blending has resulted in US patents and many more patents are awaiting ahead. Grant of a U.S. Patents to Panchgavya products has given the ultimate stamp of approval for Indian Since the livestock sector has great potential for poverty alleviation utmost importance should be given for future research in this field. Therefore, establishment of research and development centers in medicinal, agricultural, pharmaceutical, nutritional, environmental, technological areas and socio-economic utility of Godhan (cow and its progeny) should be given priority. The Panchgavya theory of Ayurveda should gain popularity not only in traditional families but also in highly educated and scientific society. An integrated approach is necessary to promote the highly valuable virtues and wide applications of Panchgavya. Thus it can be inferred that Panchgavya/ Cowpathy, a new version of ancient science, is definitely a promising formulation in the years to come. Therefore, educating people about the benefits of cow and Panchgavya can provide solution to problems of shortage of food grains, fuel, shelter, good health, nutrition, eradication of poverty, and unemployment and as alternate source of energy.

Srimathi1 (2013) J. curcas and P. pinnata seeds fortification with Panchagavya at 2 and 5% for 16 and 8 h, respectively of soaking had highest invigoration effect than water soaking and control. Thus, this study may suggest that Panchagavya application is one of the traditional, ecofriendly and low cost technique to enhance the better seed invigouration and promote the successful large scale afforestation in tree species.

Rupa Joshi (2015) Panchagavya Ghrita at the dose of 4000 mg/kg showed an anticonvulsant effect against MES induced seizures and also potentiated the anticonvulsant effect of PHT and CBZ. Moreover, the alteration in the serum levels of PHT and CBZ, when co-administered with PG, was statistically insignificant. Therefore, PG can be a potential adjunct to the conventional AEDs as it helps in increasing the efficacy, reducing the dose and decreasing the side effects of these AEDs. Further studies can be planned to study mechanistic approaches to elucidate the antiepileptic activity of PG at different dose levels in different experimental models.

Rahul Kumar (2013) The present study of synergistic action of different composition of constituents of Panchagavya (PG) as well the ethanolic extract of Aloe barbedansis Mill (EEAB) (Xanthorrhoeceae) has opened new area in the field of antistress.

D.S.Sayi,SuryaMohan (2018) A proteolytic bacterium was isolated from Panchagavya and identified genotypically belonging to Acinetobacter spp, which are well known for their biofertilizer properties. The current microbiological analysis of Panchagavya generated a primary data in terms of its biofertilizer potential. However, a detailed study needs to be carried out to investigate the microbial biodiversity related to pro-agricultural and medicinal importance of Panchagavya. Through these studies, the biotechnological knowledge of Panchagavya in Vedic scripts can be explored.

Pawar Madhuri (2016) The results of this study give scientific evidence of antiepileptic effect of PGG in ICES model with favorable effects on cognitive function of study animals as compared to standard drug Phenytoin. 016)

Shihabudeen EM (2014) considering the over all results in obsession and compulsion there is significant change in the trial group. there is also a significant change in the control group even though not at the levels as for the study group . the effects attained by the trial group are better maintained in the follow up period when compared with the other. This shows the efficacy of panchagavya ghrita in the management of OCD . But the groups were not satistically significant. Also the non pharmacological intervention can also be improved using latest methods like cognitive behaviour therapy and exposure and response prevention therapy. In brief , Ayurveda can contribute a lot to the management of conditions like OCD and to improve the quality of life .

V N maheswari (2016) in this study , better growth effects were observed in vermiwash and panchagavya treated plants than the chemical fertilizer and control lablab plants . interestingly , remarkable growth promoting effects were recorded only in 10.3% vermiwash and panchagavya treated group . thus , the results obtained from the field experimental condition suggest that 10.3% vermiwash and panchagavya could be explored as effective foliar spray for the better growth of vegetable crops in the near future.

Gayathri (2015) The experiment on the effect of panchagavya on lady’s finger, tomato and beans have shown a miraculous result on different concentrations of 5%, 6%, 7% and 8% solution. This experiment initially started with soaking the seeds in 1:1 ratio solution of panchagavya solution and water alone as control.

Sivapragasam (2019) In this study, effect of different combinations of Panchagavya by varying the tender coconut water quantity on plant growth is studied and compared with current control combination used by farmers. From the result obtained, it is concluded that an addition of tender coconut as reflected in combination significantly increases the plant yield. Hence it is recommended to use tender coconut water while preparation of panchagavya solution and while preparation of organic fertilizer.

Bishal Chakraborty (2019)The colour of freshly prepared Panchagavya was light brown and as the storage period increased, the preparation became darker in colour. It might be due to a series of nonenzymatic Maillard's reactions, started with binding of aldehyde group of lactose with εamino group of the lysyl – residues (aminoacid radical, or residue of amino-acid lysine) from different milk proteins during storage. These reactions caused the formation of brown-coloured pigments, such as pyralysins and melanoidins, polymers such as lactuloselysine or fructose-lysine, as well as lowmolecular weight acids. Cow dung and cow urine enhanced the rate of decomposition and for that dark brown colour was developed (Kneifel et al., 1992) (Singh et al., 1992). Fresh preparation of Panchagavya possessed a fruity smell. Foul odour was observed after 20 days and progressed up to the end of storage. The reason behind this might be the light sensitiveness of riboflavin and riboflavin absorbed visible and ultra violet light, converting that energy into highly reactive forms of oxygen. That induced a whole series of oxidative reactions, caused oxidation of fat.

Tharmaraj. K (2011) From the foregoing review it can be concluded that plant growth substances present in Panchagavya help to bring rapid changes in phenotypes of plants and also improves the growth and ultimately improve the productivity of the crops.

Suman Purohit (2020) A systematic work needs to be carried out on chemical nature, biological activity, microbiology and pharmaceutical aspects and mechanism of bioactive compounds in Panchagavya along with promotional clinical trials both in preventing and treating diseases.

Ramya V (2016) Natural products mostly contain various of chemical substances of different nature and their variations. In the present study panchagavya was analyzed for biochemical constituents by using different methods. The biochemical and micronutrients present in panchagavya attributes to the enhanced growth and yield of crops (Ramya and Karpagam 2017). Panchagavya not only enhances plant growth but also increases the fertility of the soils.

Dalal (2014) From the result and discussion, it was viewed that, liquid fertilizer helps to maintain the soil pH in favour of microbial count by increasing their number that facilitates the inorganic formulation from soil into the organic farming forms

Dhasarathan. P (2018) Influence of panchagavya on the invigoration of seed germination and meristic changes in plants were evaluated. The seed germination ability of Abelmoschus esculentus was analysed by soaking the seed in panchagavya concentrations and water for 12hrs and 24 hrs. The 24 hrs pre treatment of seeds showed good germination ability when compared with 12 hrs pre soaking. The germination ability in the seeds varied with the concentration of the panchagavya

Pramod kumar (2018) From the foregoing review, it can be concluded that plant growth substances present in Panchagavya help to bring rapid changes in plants and also improves the growth, yield and ultimately improve the productivity of the crops. Its application increases immunity power in plants thereby confers resistance against pest and diseases and also provided various beneficial metabolites produced by microorganisms such as organic acids, hydrogen peroxide and antibiotics which are effective against various pathogenic microorganisms. Thus, Panchagavya plays a major role in organic farming and sustainable agriculture.

Vimalendran.l (2013) The results of the present study, indicated that application of entire dose of recommended (150:60:40 kg NPK ha^{-1}) fertilizers (100%) with four sprays of three percent panchagavya at 15, 25, 35 and 45 days after sowing recorded higher yield attributes, yield and economics of babycorn cv. COBC 1.

Tejeswara rao.k (2013) The tallest plants with largest leaf area and highest dry matter accrual, with the largest head diameter, highest number of total and filled seeds head-1 and highest grain weight, highest yield (seed as well as stalk), highest harvest index of sunflower were produced with recommended dose of fertilizer. With the recommended dose of fertilizer, any crop would perform at its best, because of adequate and balanced nutrient supply to the crop at the right time of requirement. Accordingly, the sunflower crop under comfortable nutrition could produce the growth parameter of the highest stature, which could accrue huge quantity of biomass and partitioned a sizeable quantity of assimilates to the sink.

Sharvan kumar(2018) On the basis of above findings it can be concluded that recommended dose of fertilizer, has proved to potential in case of whole plant weight, curd weight, curd length, curd diameter, stem weight, stem diameter, stem length and yield of cauliflower displayed heighst value amongst the treatment of various combination of bio-enhancers viz., Panchagavya, Jivamrita and vermiwash. The treatment T5 Panchagavya (4%) + Vermiwash (1:5 times dilution) came out the best combination for growth and yield characters. T5 (Panchagavya 4% + 1:5 times dilution of Vermiwash) and RDF displayed approximately similar values, although the values of RDF are at quite higher side. The revenue gained through organic tags is much more than inorganic. Therefore, even if the amount of produce is low, revenue generation is not affected. The emphasis nowadays is given to human health, soil health, environmental health and quality product instead of quantity. Hence, the treatment number five (Panchagavya (4%) + Vermiwash (1:5 times dilution) can be ~ recommended for organic cultivation of Hybrid Shritha for quality cauliflower production

CHAPTER – 3 AIM AND SCOPE :

3.1 AIM :

To prepare panchagavya and note its effect on various seeds and seed germination

3.2 OBJECTIVE :

1.To prepare panchagavya

2.Panchagavya treated with plants in different concentration

3.Growth of the plants were observed and measured

4.measurements are tabulated

CHAPTER – 4 MATERIALS AND METHODOLOGY :

4.1 INGREDIENTS FOR PREPARING ONE LITER OF PANCHAGAVYA :

1.cow dung – 250g

2.cow urine – 150

3.cow milk – 100g

4.cow curd – 100ml

5.cow ghee – 50g

6.banana – 0.6

7.coconut water – 150g

8.25g jaggery mixed with 150ml of water

4.1 ingredients used to make panchagavya

4.2 METHODOLOGY

4.2.1 PREPARATION OF PANCHAGAVYA

1.Take a wide mouth plastic ,clay or wooden container. (do not use metal container)make sure its clean and sun dry it for a day or two to sterilize it

2. mix the cow dung and ghee in the container using a wooden stick . (again do not use any metal here . stir in clockwise direction in a rhythmic motion

3. Then stir in anticlockwise direction . do not mix vigorously it will kill the beneficial microbes in cow dung

4.cover the container using thick cloth to protect it from insects . leave this mixture for three days . keep it away from direct sunlight and rain . give it a stir once in the morning and evening . 12 times in each direction works well

5.On the fourth day slowly stir in all other ingredients . make sure you are mixing them in while stirring the mixture in a single direction .

6. Leave it for 15 days .

4.2.1 PANCHAGAVYA

4.2.2 PANCHAGAVYA TREATED WITH SMALL ONION :

We are going to grow small onion in 5 different concentration using panchagavya

4.2.3 CONCENTRATIONS :

1. 25ml of panchagavya mixed with 75ml of water
2. 50ml of panchagavya mixed with 50ml of water
3. 75ml of panchagavya mixed with 25ml of water
4. 100ml of panchagavya
5. Small onion soaked in 100ml of water

- Small onion has to soak in these concentrations for one hour
- Then the onion was planted in the soil

- The growth of the shoot has to be observed and measured
- Results has to be tabulated

4.2.2 SMALL ONION SOAKED IN PANCHAGAVYA

CHAPTER – 5 RESULT AND DISCUSSION :

5.1 GROWTH RATE OF ALLIUM SEPA

S.NO	CONCENTRATION OF PANCHAGAVYA	PLANT-1	PLANT-2	PLANT-3	PLANT-4	PLANT-5	MEAN VALUE
01	25% of panchagavya	29.5cm	25.5cm	25cm	20cm	29cm	25.8
02	50% of panchagavya	30cm	27cm	18cm	29cm	33.5cm	27.5
03	75% of panchagavya	29cm	29cm	34cm	34cm	32cm	31.6
04	100% of panchagavya	28cm	30cm	25cm	26cm	30cm	27.8
05	Without panchagavya	30cm	23cm	32cm	24cm	31cm	28

5.1.1 ONION GROWN IN 50% OF PANCHAGAVYA

5.1.2 onion grown in 50% of panchagavya

5.1.3 onion grown in 75% of panchagavya

5.1.4 onion grown in 100% of panchagavya

5.1.5 onion grown without panchagavya

5.2 DISCUSSION

Application of panchagavya at 75% recorded the highest plant height. panchagavya might have provided nutrients continuously as well as growth hormones that are linked to the increase in leaf area/plant as a consequence of more assimilatory surface area which promoted production of larger quantities of photosynthates finally resulting in better plant growth and development. More leaves/plant might be owing to the adequate availability and supply of nutrients in balanced proportion, which ultimately resulted in triggering the production of plant growth hormones in combination with humic acid and other hormones in onion. Lal et al. (2002) found that with increased rates of organic manure application resulted in better plant growth as indicated by increase in plant height and number of leaves/ plant. This might be due to larger availability of nutrients which in turn promoted the growth as well as yield components. Further, the possible reason might have the availability of optimum quantity of major and micronutrients and the action of growth hormones produced by the different sources of organic manures (Muthuramalingam et al., 2001; Prabhakaran, 2002). Higher yield of onion was mediated by increased biological process and soil enzymatic activity. Foliar spray of panchagavya and vermiwash might be supplied growth hormones, viz. gibberellic acid, auxin and other growth promoting hormones. Application of panchagavya increased the bulb size, as it contained metabolites required in the source and there was greater accumulation of assimilates in the sink (Velu, 2002).

It is clearly evident that organic onion production is feasible by following appropriate scientific organic farming practices with emphasis on organic nutrient supply through locally available manures, green biomass with suitable enrichments.

CHAPTER – 6 SUMMARY AND CONCLUSION

Panchagavya or panchakavyam is a mixture used in traditional Hindu rituals that is prepared by mixing five ingredients. The three direct constituents are cow dung, urine, and milk; the two derived products are curd and ghee. These are mixed in proper ratio and then allowed to ferment. The Sanskrit word panchagavya means "five cow-derivatives". When used in Ayurvedic medicine, it is also called cowpathy Panchagavya is an organic product produced by using five different by-products of cow like cow dung , cow urine , cow milk , ghee , curd and other ingredients .It has the potential to play the role of promoting growth and providing immunity in plant system by confers resistant against pest and disease . panchagavya contains several nutrients like N ,P,K and micronutrients which are required for the growth and development of plant and also contains various amino acids , vitamins ,growth regulators like auxin , gibberellins and also beneficial micro organisms like pseudomonas ,Azobacter and phosphor bacteria etc . The present study is to investigate the effect of various concentration of panchagavya on Allium sepa. Among the concentration 75% of Panchagavya given significant growth rate.

Panchagavya is an organic product having the potential to promoting growth and providing immunity in plant system. The report reveals that **“75% of panchagavya is recommended for small onion for their better grown and cultivation”**

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