"Bioconversion of floral waste into Effective Biocompost by using Microbial consortium from Indigenous Gir cow"

A

Thesis

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Summary

Introduction

Degradation of floral waste is an extremely moderate procedure when contrasted with kitchen waste degradation. In this way there is a requirement for appropriate and eco-friendly process for flower waste treatment. Cow dung contains a diverse range of microorganisms with variable characteristics. Utilizing the microbial flora in cow dung can help with all practical horticulture and vitality requirements. The various organic materials employed in the composting process were fully utilised and converted to rich compost, making fertilising the soil an excellent waste-reusing process. Composting and its use generally help to increase soil nutrients and enhance certain soil characteristics, including pH, surface, soil aggregation, and chemical composition. Most farming practises focus solely on the soil and do not take the environment into consideration. Homa farming, on the other hand, operates under the premise that by purifying, repairing, and reviving the environment, all life within it is given new vitality.

we isolate total seventeen number of bacterial colonies which are capable to degrade floral waste and we developed consortium from this seventeen microbial colonies and after successful enrichment process microbial consortium are able to degrade floral waste speedily it takes around 36 days and after that we make biocompost by using this consortia and finished biocompost is found much better than the commercially available compost and Agnihotra Yajna is relatively affordable; it has a positive impact on the environment and soil health. So we concluded that combined effect of floral waste biocompost and Agnihotra ash shown positive effects on soil fertility and plant health

Chapter 1 - Introduction

In India, using flowers to express respect is customary. These flowers will undoubtedly be replaced by new blooms that age a great deal of plant matter from shelters, homes, etc. There will undoubtedly be an estimated 80,000,000 tonnes of plant waste discharged into rivers in India. Degradation of floral waste is an extremely moderate procedure when contrasted with kitchen waste degradation. In this way there is a requirement for appropriate and eco-friendly process for flower waste treatment.

Cow dung contains a diverse range of microorganisms with variable characteristics. Utilizing the microbial flora in cow dung can help with all practical horticulture and vitality requirements. One of the world's bioresources that is widely available and is still largely underutilised is this one. Understanding the mechanisms that allow organisms found in cow dung to break down hydrocarbons can help with bioremediation of naturally occurring contaminations. , lipase, and esterase lipase were all administered via seclusion. Composting is thought of as an aerobic, thermophilic, microorganism-mediated, solid state fermentation process that transforms various natural materials into more stable entities that serve as the basis for humic compounds. As a natural fertiliser, agnihotra ash is also incorporated into the soil. The essential element that promotes soil and plant growth in numerous ways is ash. In addition, a paste made of Agnihotra ash.

Chapter 2 - Literature Review

Studied literature review and current research on floral waste degradation.The degradation process for floral waste has been the subject of several research and is constantly being reconsidered in order to create value-added product. Researchers have worked on projects using various methodologies and obstacles. Floral waste generation occur largely during functions, worships, ceremonies, festivals, etc. The flower wastes are released in the water bodies or dumped at the available places of land which creates severe environmental pollution and health hazards. Degradation of floral waste is a very slow process as compared to kitchen waste degradation. Hence aim of present study is to develop efficient microbial consortium for the bioconversion of floral waste into compost and Alternate source of chemical fertilizer.

Chapter 3 - Development of Enriched Microbial Consortium

Flower wastes were collected from the following selected shrines, including Rajkot, Haridarshanam temple, events, worship, rituals, festivals, etc For the isolation of floral waste degrading microorganism we collect following samples from Satyakam Gaushala, Rajkot, in which we have image of cow dung, cow urine and gaushala soil sample and cow saliva and skin samples image capturing process not accessible. After aggregation floral waste from varied locations, perishable waste containing wreaths and flowers was separated from non-biodegradable elements containing plastic, paper,

twine, and different waste and then extract liquid media from it. The unique pH of the floral extract was 4.7, which was too acidic to allow for the development of typical microbes. As a result, pH was adjusted to 7.2 and 5.6 to separately support the growth of microorganisms. 3.0 g/100 ml of agar powder was added to the flower extract for media hardening, which was followed by media sanitization at 15 psi for 30 minutes at 121 °C. Samples of Indigenous Gir Cows dung, urine, saliva, skin and gaushala's soil were collected from Satyakam Gaushala. 100 cc of flower waste medium was inoculated with 1 g of each collected sample and mixture of all sample test. Using floral waste agar plates, we are able to identify Seventeen different bacterial colonies that are capable of degrading floral waste.

Chapter 4 – Process of Flower Waste Biocomposting

For biocomposting first we go for lab scale and subsequently after lab scale we go for the pilot scale. We took two set one is control and second experimental also took same ratio of waste flower, soil and developed microbial consortium in both lab and pilot scale. Temperature, pH, electrical conductivity (EC), total organic carbon, total organic matter, total nitrogen, total phosphorus, total potassium, and C/N ratio were among the physical and chemical parameters examined. Finished compost made from floral waste by using microbial consortium developed from cow dung. Analysis of physic-chemical parameters shows that our finished is better than commercially available compost.

Chapter 5 – Effect of Floral Waste Biocompost and Agnihotra ash on Plant Growth

To study effect of Agnihotra ash and floral waste biocompost and floral waste bio compost on germination of plant,following water and biocompost were used a. Control soil b. Agnihotra ash and floral waste biocompost with biocompost (1 gm Agnihotra ash and floral waste biocompost + 30 gm biocompost + 70gm soil) The germination process has several stages. A one-way ANOVA was used to test the effect of fertilization (soil vs. soil and vermicompost vs. soil, biocompost and Agnihotra ash) on germination rate, shoot length, root length, number of leaves, and plant weight.

Statistical analyses were performed using R software (R development Core Team, 2008). If the effect is significant ($p<0.05$), then it will be done with Tukey's advanced test, which aims to see the difference between the different combinations of fertilizers on different parameters. The optimized composition was obtained by applying constraints on dependent variable responses and independent variables. The constraints were maximum germination, shoot length and root length. These constrains were common for all the trials. There commended concentrations of the independent variables were calculated by the Design Expert® version 13 Stat-Ease, Inc., MN,USA)software from the overlay plot (Fig. 23). The optimum values of selected variables obtained were 0.18 (X_1; Agnihotra ash) and 0.69 (X_2; Biocompost. The final optimized composition comprised of 0.81 gm. Agnihotra ash, 31.05 gm. Biocompost.

Conclusion

With this research we concluded that microbial flora of Indigenous Gir cow are effective for degradation of floral waste and help to convert floral waste into the biocompost in this study we isolate total seventeen number of bacterial colonies which are capable to degrade floral waste and we developed consortium from this seventeen microbial colonies and after successful enrichment process microbial consortium are able to degrade floral waste speedily it takes around 36 days and after that we make biocompost by using this consortia and finished biocompost is found much better than the commercially available compost. So the present research saws positive results and it helps to reduce environment pollution by degrading floral waste and also helps for production of effective biocompost alternate of chemical fertilizer and which is very useful in organic farming, enhance soil fertility and plant growth also helps to reduce the soil pollution. Agnihotra ash and floral waste biocompost assisted germination and can therefore be used as a fertilizer. This demonstrates how Agnihotra ash and floral waste biocompost benefits the environment and plant health in a favourable way. Agnihotra ash and floral waste biocompost has ensured healthy plant growth. Agnihotra's atmosphere and ash can be used as adjuvants in the 'Natural farming' methods also known as the Agnihotra farming methods. Agnihotra Yajna is relatively affordable; it has a positive impact on the environment and soil health. So we concluded that combined effect of floral waste biocompost and Agnihotra ash shown positive effects on soil fertility and plant health