Chapter-4

Process of Flower Waste Biocomposting

4.1 Material and Methods for Biocompost preparation

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. In lab scale the amount of crushed and reduced-size floral waste collected has increased the rate at which compost is created. The soil was added to the floral waste because it has the ability to absorb moisture, which is important for the growth of microorganisms. We chose four buckets with holes on the bottom and side walls for aeration and water removal. A layer of coconut coir of 2 cm in height was created at the bottom of the chamber to preserve the aerobic conditions, and it was topped with garden soil. Floral debris and 25% consortium were spread on top of the soil. For composting purposes, a chamber filled with an additional layer of soil and consortium-inoculated floral debris was kept in a moist environment. And in pilot scale took large amount of floral waste, soil and consortium in similar ratio (Mulay et al., 2020)

Chamber were prepared having the following combination

Soil +Floral waste (Control)

Soil+ Floral waste + consortium (experimental)

4.2 Physico-Chemical Analysis of Biocompost

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. For the purpose of estimating pH, 15g of compost was combined with 30ml of distilled water and shaken for an hour. Filtration was done, and a pH metre was used to check the filtrate's pH. Using a conductivity metre, the filtrate's electrical conductivity was determined. 5g of created compost was placed on a dry petri dish, dried at 55°C until consistent weight was obtained, and the percentage moisture level was then calculated (Maiti, n.d.). Compost was diluted 1:10 (w/v) and shaken for 45 minutes at 150 rpm on a rotary shaker. This sample of compost was used for additional analysis. The Kjeldahl method was used to calculate the nitrogen content, and the Walkley and Black method was used to determine the amount of organic carbon (1934) (Walkley & Black, 1934). digester heating the 0.2 g sample was digested with a mixture of 10 mL H_2SO_4 and $HClO_4$ (5:1) at

300°C 5°C for two hours using. Utilizing stannous chloride techniques, the digested samples were used to determine the total phosphorous content. Utilizing a flame photometer, the concentrations of Na, K, and Ca were determined. Atomic absorption spectrophotometer analysis will also be done on the samples' Ca and Mg contents. The measured values of C and N will be used to determine the C: N ratio (Adhikari et al., 2009).

Fig. 13. Flowers kept in perforated bucket for water removal

4.3 Result

Fig.17 shows the 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 as shown in table-3, in which we check total 12 different parameters by using suitable procedure and we found our finished biocompost are excellent in quality because amount of N P K and C: N ratio is shows good in finished compost also other parameters like pH, Electrical Conductivity, moisture, Ca, Mg and odour shows good results compare to commercially available compost.

Sr. No.	Parameter	Control (Commercially available Compost)	Finished Compost
1	Color	Brown	Dark Brown
2	Odor	Odorless	Odorless
3	Moisture (%)	28	39
4	pH	7.4	7.1
5	Electrical conductivity ($mScm^{-1}$)	3.6	4.3
6	Nitrogen (%)	1.59	1.99
7	Carbon (%)	42.12	59.69
8	C:N ratio	26.49	29.99
9	P ($g\ kg^{-1}$)	3.6	5.3
10	K ($g\ kg^{-1}$)	17.6	21.7
11	Ca ($g\ kg^{-1}$)	4.3	5.8
12	Mg ($g\ kg^{-1}$)	0.41	0.53

Table-3: Physico-Chemical Analysis of Finished Compost with commercially available

Fig. 14. Biocompost preparation at Initial Phase (0 Day)

Fig. 15. Biocompost Preparation after 18 days

Fig. 16. Biocompost Preparation after 36 days

Fig.17. Finished Biocompost