iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** V **Month of publication:** May 2022

DOI: https://doi.org/10.22214/ijraset.2022.42500

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue V May 2022- Available at www.ijraset.com

Design and Fabrication of Marigold Flower Hydrosol Extraction Machine and Manure Making

Prof. A. V. Vanalkar[1], Mahesh Dhodre[2], Pratik Anwane[3], Prajwal Mantinwar[4], Ritesh Kanade[5], Shivam Kalbande[6], Aniket Mohite[7]
[1, 2, 3, 4, 5, 6, 7]*Mechanical Department, K. D. K. College of Engineering, Nagpur*

***Abstract:** India is the religious country with a huge population. And their are lots of hindu temple present here. This devotion towards god comes with price in the from of flower. And this flower create a lot of pollution in solid from and due to improper management of this waste create air pollution and other types of pollution which harms the nature critically. In an average in India their are 60 cores tons of marigold flower are devoted to the god and create such a problems as we discuss. Hence to tackle such a situation in such a way to create some revenue from those waste and also reduce pollution we design and fabricated marigold flowers hydrosol and manure extracting machine. This machine works on water distillation process and represent thermodynamic cycle. Here flowers get boiled with water and it create steam of flower essences and get cold down into liquid from in condenser and by this process we get hydrosol and manure (in boiler). Their are also other process to extract these items from flower but water distillation process is more easy, effective and simple than other process and it create absolutely low or no pollution.*

I. INTRODUCTION

In our day to day life we came to see lots of marigold flower going to waste and create pollution to tackle these problem design and fabricated marigold flowers hydrosol and manure extracting machine which makes hydrosol and manure from marigold flower. this hydrosol is very use full in many sectors such as cosmetics ,ayurvedic and even also use for making perfume and diffuser due to its unique essences. And manure got from that boiler is get fermented for several weeks for its proper decomposition and conversion into organic fertilizer this fertilizer does not contain any inorganic material or any adulteration which makes it 100% natural and harmless for soil. These process works on water distillation process. Here first flower and water are take to the container in proper ratio after that container get heated by induction coil and leads to boil water and flower mixture. This mixture generate mixed steam and these steam is passes to condenser. and inside the condenser that steam converted into hydrosol and we also get manure from that boiled flower.

II. COMPONENTS

1) *Pressure Cooker:* We use pressure cooker as a boiler since its air tight and prevents steam from escaping. It is used to perform water distillation on the flowers.
2) *Rubber Tube:* It is used to supply the steam generated in the boiler to the condenser coil for cooling.
3) Copper Tube: It is made up naked copper coil which is placed inside the condenser in spiral form and steam passes through the copper tube continuously.
4) *Condenser:* It consist of copper tubing which helps to cool the hot steam. Its function is to condense the steam received through rube tube and convert it into liquid using cold water.
5) *Tap:* This tap is used to get hydrosol and oil separately by density difference.
6) Container and Water Pump: It is used to store and provide continuous cold water flow to the condenser to cool down steam.
7) *Induction:* It consist of electric heating coil which is used to heat pressure cooker to generate steam of flowers and water mixture.

III. WORKING

1) Take the mixture of flower and water in pressure cooker
2) Put that boiler on induction coil.
3) And start the induction coil.
4) Induction coil heat up and also provide heat to boiler
5) Boiler heat up the water up to 100 ºC and flower inside it.
6) As boiler's water reach its boiling point it create vapour of water and flower.
7) This vapour flow through pipe toward condenser at 130 ºC.

©IJRASET: All Rights are Reserved

8) Condenser condense that vapour into liquid which is also called as hydrosol as it get continuous flow of cold water around that vapour contain pipe

9) This hydrosol is collected in another tank which also have small amount of oil and by this way we get our final product hydrosol and boiler mixture of water and flower is use as manure.

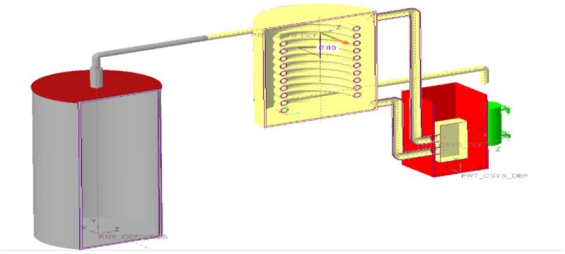


Fig 1.1: 3D CAD Model



Fig 1.2: Actual Model

IV. OBSERVATION TABLE

Experiment No.	Volume of flowers	Time of Heating (min)	Hydrosol Extracted (ml)	Initial water in cooker (liter)	Heat rate
1.	25	50	450	1	3
2.	50	57	400	1	3
3.	75	60	350	1	3
4.	100	65	325	1	3

Following table are the representation of the experiment that we have perform the study of the hydrosol after doing the some changes in quantity of flower.

1) 1st observation shows that if we take a 25 marigold flower and then mix it with the 1 liter of water and providing it the heat at the speed of 3 of heater then it will take 50 min and give 450 ml of hydrosol in this case the density of the hydrosol is low.

2) 2nd observation shows that if we take a 50 marigold flower and then mix it with the 1 liter of water and providing it the the heat at the speed of 3 of heater then it will take 57 min and give 400 ml of hydrosol in this case the density of the hydrosol is high in comparison with the hydrosol of observation 1.

3) 3rd observation shows that if we take a 75 marigold flower and then mix it with the 1 liter of water and providing it the the heat at the speed of 3 of heater then it will take 60 min and give 350 ml of hydrosol in this case the density of the hydrosol is high in comparison with the hydrosol of observation 1 and 2 .

4) 4thobservation shows that if we take a 65 marigold flower and then mix it with the 1 liter of water and providing it the the heat at the speed of 3 of heater then it will take 65 min and give 325 ml of hydrosol in this case the density of the hydrosol is high in comparison with the hydrosol of observation 1 ,2 and 3.

Hence we perform the experiment and from the observation we conclude that as we increase the quantity of flower the quantity of hydrosol we get at the end of the process is less but the density get thicker and essence and aromatic property of the hydrosol get increase.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

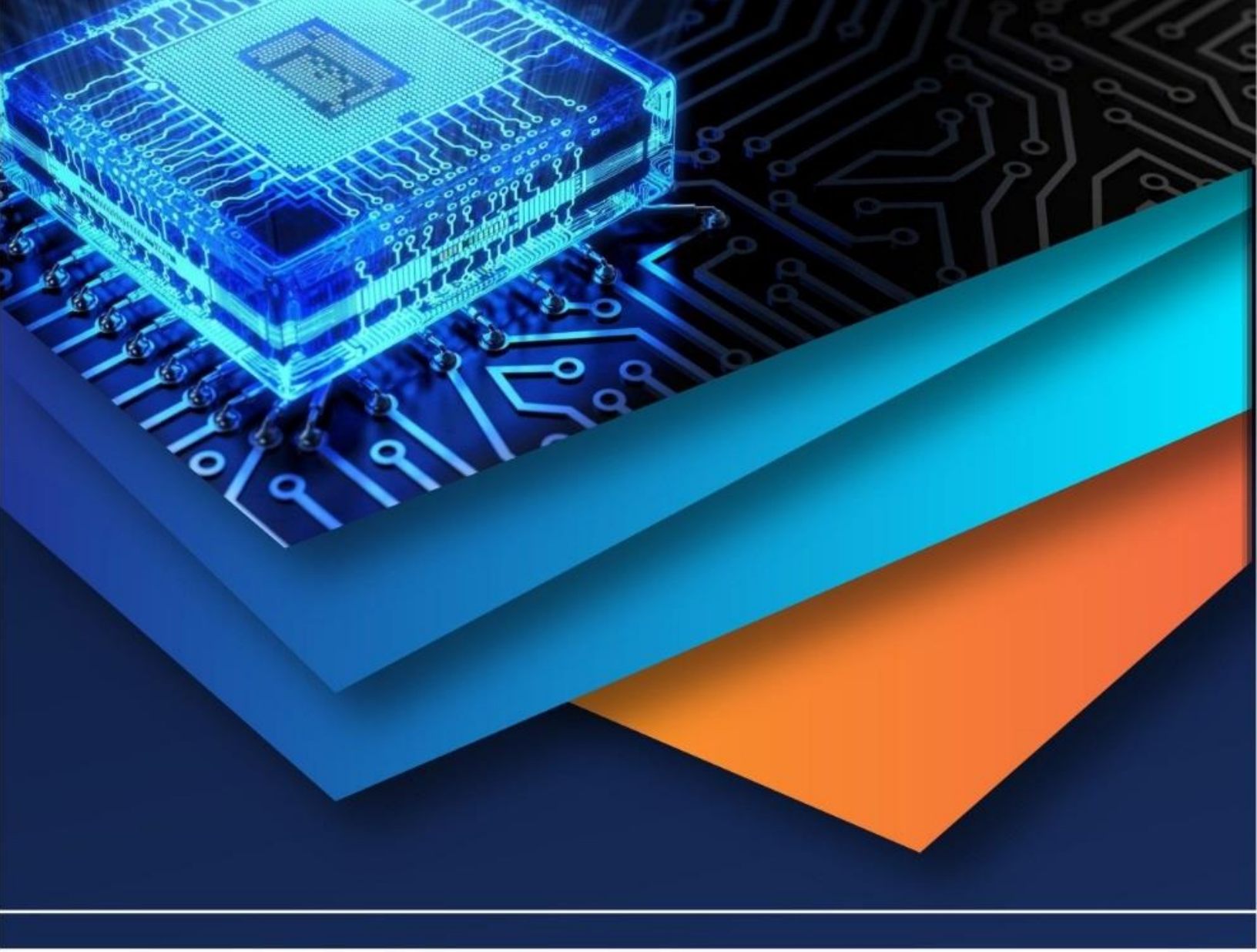
V. OBJECTIVES

1) To reduce the pollution.
2) To manage waste of marigold flower.
3) To generate revenue from it.
4) To generate employment.
5) Help to provide medical material in ayurvedic sector.
6) To provide organic fertilizer.
7) To provide raw material in cosmetic sector.
8) To represent thermodynamic cycle with open body.

REFERENCES

[1] Distillation - Wikipedia.
[2] A.Tezel; A. Hortacsu; O. Hortacsu, “Multi-component models for seed and essential oil extraction” Supercritical Fluids.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)