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AKS University, Satna (M.P.)

THE UNIVERSITY WITH DEFFERENCE

Evidence of Success of Best Practice II



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7.2.1.2 Evidence of Success of Best Practice – II “Interdisciplinary Research Centres for Innovation and Collaboration”

1. Product and Technology development by Department of Chemistry

1.1 Type of paint manufacturing in AKS University

- i. **Manufacturing of Green Paints:** A small manufacturing unit is established in 2022 for manufacturing of non-hazardous following wall paints. These all-following types of paints are manufactured by team of students and these products is not only utilized in university but also being sold outside of university.
- ii. **Green Distemper Paint:** This product is being manufactured by utilizing CMC (carboxy methyl cellulose) prepared from fallen leaves of trees with other ingredients. This product is cost effective having no hazardous heavy metals and no volatile organic compounds. (An application for Indian Patent has been filed)
- iii. **Night Glowing Emulsion Paint:** This is a unique green emulsion paint prepared by utilizing waste plastic-based oil and waste of marble mine. This can be applied in darker region where electricity suddenly cut off. This paint glows in dark and maintain the visibility in extreme dark condition. (An Indian patent has been Published, 15/09/2023)
- iv. **General Emulsion paint** This is general emulsion paint prepared by utilizing marble mine waste as well as plastic waste-based oil



Figure 1: Paint Manufacturing Unit at AKS University

- 1.2 **Conversion of waste single used plastic in to white hydrocarbon oil Pyrolysis Unit:** This unit has developed for utilization of plastic waste generated in campus of university. Although single use plastic is banned in our university campus but single use

plastic enters through goods packaging material with goods ordered by university for various applications and this plastic waste is utilized here for production of hydrocarbon oil. The white hydrocarbon oil generated by this machine is used for paint manufacturing. (An Indian Patent has been published on 6/10/2023)



Figure 2: Pyrolysis Unit

- 1.3 **Assembly for Removal of Arsenic from Underground Water** This is an assembly based on O₃ treatment in presence of ferric hydroxide and precipitation of As(v) with ferric hydroxide. This unit has capability to reduce 100 ppb of As (III) to below 10 ppb Arsenic (III). (An Indian Patent has been published)



Figure 3: Assembly for Arsenic Removal

- 1.4 Mechanical Grinding Assisted Microwave Assembly for Synthesis of Organic Compounds: This assembly has been developed for development of new green method of synthesis for organic and inorganic compounds. (An Indian patent has been published on 22/3/2024)



Figure 4:

Mechanical Grinding Assisted Microwave Assembly for Synthesis of Organic Compounds




1.5 Design of Smart Humidity Detector: Design of smart humidity detector has been developed and applied for Indian patent. The Indian patent was granted on 23/12/23. This technology has been transferred to ISO-TECH System Pvt. Ltd. for manufacturing of instrument by using this technology


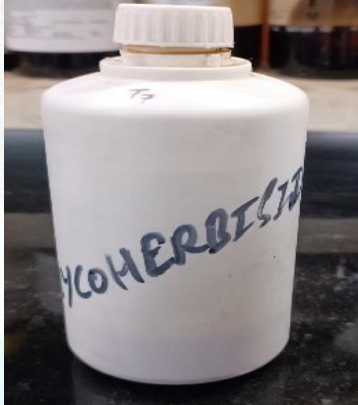



Figure 5: Smart humidity detector

2. Bioproducts developed by Department of Biotechnology faculty and scholars for Industrial Level Production

S. No.	Product Name	Analysis done	Viability of the product
1.	Nanobiofertilizer Production and Commercialization	All parameters tested to check the quality of suitable biofertilizers. Nanocellulose was characterized and utilized for making formulation of biofertilizers to enhance the shelf life and maintain	It is very demanding product and CAGR is high. Having great potential to earn higher revenue and profit margin.

		<p>the cell viability and quality of biofertilizers</p>	<div style="text-align: center;">  <p>नैनो बायोफर्टिलाइजर्स रिसर्च एवं डेवलपमेंट (म.प्र. विज्ञान और प्रौद्योगिकी परिषद, म. प्र. सरकार प्रायोजित परियोजना)</p>  <p>नैनोबायोफर्टिलाइजर</p> <ul style="list-style-type: none"> • यह फसल कि उत्पादन क्षमता में वृद्धि करता है । • फसल में होने वाले रोगों से बचाव करता है । • इसमें कीटनाशी गुण होने से यह कीटों से फसल कि रक्षा करता है । • इस जैव उर्वरक को लम्बे समय तक संरक्षित रखा जा सकता है । • मिट्टी कि उर्वरता में सुधार करता है साथ ही यह पर्यावरण के अनुकूल है एवं पोषक तत्वों का नवीकरणीय स्रोत भी है । </div>
<p>2.</p>	<p>Microbial Decomposer for fast conversion of agrowaste biomass in Compost for mushroom production</p>	<p>Microbial decomposer is designed with 15 bacterial cultures isolated based on metagenomic studies. All culture were evaluated for their potential to decompose the agrowaste material by employing various mechanisms</p>	<p>Product could be very demanding for mushroom growers and reducing the load of spent mushroom substrate.</p> 
<p>3.</p>	<p>Biodetergent: An alternate of Chemical based detergent</p>	<p>This product is prepared by enzymes, biodegradable chemicals. (Testing undergoing)</p>	<p>The market of biodetergent is huge. The quality biodetergent is in highly demand. Our biodeternt is prepared by adding enzymes we produced in our own facility and biodegradable chemicals.</p>




			
4.	Mycoherbicide for controlling weed	It is developed by our own R&D. We are utilizing mycoherbicial biochemicals extracted from selected fungi	<p>Efficient and safe. Avoids the introduction of toxic chemicals into the environment</p> 
5.	Virokil	Antiviral, Anti-cancerous, & Immunity Booster, (Cordyceps Mushroom Product)	<p>It is very effective to boost our innate immunity and protect us from viral infections prominently.</p> 
6.	Mother Tinchher (Alcohol Based)	Immune Booster (Cordyceps Mushroom Product)	<p>It is very effective to boost our innate immunity and protect us from viral infections prominently.</p>



		<ul style="list-style-type: none">Spirulina (<i>Arthrospira platensis</i>) powder; and Ginger powder.	
10	Natural Microbial Culture Media	Green microbiology practices. Culture well grown on this range of plant based microbial culture media	Our approach is unique to start the green microbiology practices to reduce the use of chemicals to make the culture media.

3. Department of Rajiv Gandhi Institute of Pharmacy (Faculty of Pharmaceutical Science & Technology) AKS University, Satna (M.P.)

- **Herbal shampoos:** These are made of extracts of natural ingredients; they are suitable for all types of hair and do not cause major allergies or side effects.
- **Plant-Based Dishwash Gel:** A highly concentrated formulation of powerful plant-based ingredients for squeaky clean dishes without the side effects of itchy hands, flaky skin or chemical irritation.
- **Herbal handwash:** The primary objective is to create a herbal handwash that minimizes potential side effects while providing thorough cleaning of hands, as hands are a primary site for infection transmission.
- **Bioenzyme based liquid detergent:** It is safe for your baby as the toddler's skin is more sensitive than adults. It doesn't contain any harmful chemicals; it is made up of natural ingredients. It is completely safe to use.
- **Hand Sanitizer:** Hand sanitizer (also known as hand antiseptic, hand disinfectant, hand rub, or hand rub) is a liquid, gel or foam generally used to kill many viruses /bacteria microorganisms on the hands.
- **Amritdhara:** Amritdhara has carminative properties, which means it can help relieve stomach pain and bloating caused by gas or indigestion. It may also have antispasmodic properties, which can help relax the muscles in the digestive tract and ease abdominal cramps.

																																				
7.	Cordy Tea	Immune Booster (Formulations of mushrooms and herbs)	<p>It is very effective to boost our innate immunity and protect us from viral infections prominently.</p> 																																	
8.	Mycoprotein	Immune and Strength Booster (Formulations of mushrooms and herbs)	<p>It is very effective to boost our innate immunity, body strength and vital functions of the body.</p> 																																	
9.	<i>Cordyceps militaris</i> based Herbal Formulation for Preventing the Lung Cancer and SARS-COV-2	<p>A herbal formulation for preventing the lung cancer and coronavirus, comprises:</p> <ul style="list-style-type: none"> • <i>Cordyceps militaris</i> powder; • <i>Ganoderma lucidum</i> powder; • Shiitake mushroom powder; 	<p>(12) PATENT APPLICATION PUBLICATION (21) Application No.202121025706 A (19) INDIA (22) Date of filing of Application :09/08/2021 (43) Publication Date : 16/12/2022</p> <p>(54) Title of the invention : CORDYCEPS MILITARIS BASED HERBAL FORMULATION FOR PREVENTING THE LUNG CANCER AND SARS-COV-2</p> <table border="1"> <tr> <td>(51) International classification</td> <td>:A61K0035068000, A2L300310006000, A61K0036074000, A61K0035748000, A61K0036908000</td> <td>(71)Name of Applicant : 1)AKS UNIVERSITY Address of Applicant DEPARTMENT OF BIOTECHNOLOGY, AKS UNIVERSITY, SATNA, Madhya Pradesh-485001, INDIA Madhya Pradesh India</td> </tr> <tr> <td>(31) Priority Document No</td> <td>:NA</td> <td>(72)Name of Inventor : 1)ANANT KUMAR SONI 2)KAMLESH CHOURE 3)KOUARBI SINGH GOUR 4)VIVEK AGNIHOTRI</td> </tr> <tr> <td>(32) Priority Date</td> <td>:NA</td> <td></td> </tr> <tr> <td>(33) Name of priority country</td> <td>:NA</td> <td></td> </tr> <tr> <td>(86) International Application No</td> <td>:NA</td> <td></td> </tr> <tr> <td>Filing Date</td> <td>:NA</td> <td></td> </tr> <tr> <td>(87) International Publication No</td> <td>:NA</td> <td></td> </tr> <tr> <td>(81) Patent of Addition to Application Number</td> <td>:NA</td> <td></td> </tr> <tr> <td>Filing Date</td> <td>:NA</td> <td></td> </tr> <tr> <td>(82) Divisical to Application Number</td> <td>:NA</td> <td></td> </tr> <tr> <td>Filing Date</td> <td>:NA</td> <td></td> </tr> </table> <p>(57) Abstract : The present invention relates to a novel herbal formulation for prevention of lung cancer and diseases of corona virus. The herbal formulation comprises Cordyceps militaris powder, Ganoderma lucidum powder, Shiitake mushroom powder, Sparulina (Arthrographis platenensis) powder and Ginger powder.</p> <p>No. of Pages : 38 No. of Claims : 6</p>	(51) International classification	:A61K0035068000, A2L300310006000, A61K0036074000, A61K0035748000, A61K0036908000	(71)Name of Applicant : 1)AKS UNIVERSITY Address of Applicant DEPARTMENT OF BIOTECHNOLOGY, AKS UNIVERSITY, SATNA, Madhya Pradesh-485001, INDIA Madhya Pradesh India	(31) Priority Document No	:NA	(72)Name of Inventor : 1)ANANT KUMAR SONI 2)KAMLESH CHOURE 3)KOUARBI SINGH GOUR 4)VIVEK AGNIHOTRI	(32) Priority Date	:NA		(33) Name of priority country	:NA		(86) International Application No	:NA		Filing Date	:NA		(87) International Publication No	:NA		(81) Patent of Addition to Application Number	:NA		Filing Date	:NA		(82) Divisical to Application Number	:NA		Filing Date	:NA	
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4. Research activity by Faculty of Agriculture Science and Technology



Figure 6: Student working on Chilli in the farm



Figure 7: View of Exotic Vegetable crops floriculture growing in Poly House of Faculty of Agriculture Science and Technology



Figure 8: Student activity Photographs of Mushroom cultivation



Figure 9: Student activity photograph