3.3 Innovative Ecosystem

3.3.1 Institution has created an ecosystem for innovations, Indian Knowledge System (IKS), including awareness about IPR, establishment of IPR cell, Incubation Centre and other initiatives for the creation and transfer of knowledge/technology and the outcomes of the same are evident

- **Patent Published**

S. No	Name of the Faculty	Title of the Patent	Published Date
1	Dr. G. Amala Jothi Grace	Synthesis of Value-Added Materials by Biogenic Route from Industrial Pollutants	30/08/2019
2	Dr. A. Arockia Jenecius Alphonse	Herbal Cosmetics for Skin Care Formulation	01/09/2022
3	Dr. P. Subavathy	Herbal Cosmetics for Skin Care Formulation	01/09/2022
4	Dr. G. Amala Jothi Grace	Herbal Cosmetics for Skin Care Formulation	01/09/2022
5	Dr.Vithya Vijayalakshmi	Biometrically Activated Self Defense Device for Women Safety	26/10/2019
6	Dr. S. Sowmyayami	IOT Based New Device for Dairy Cow Body Conditions Scoring System	16/07/2021
7	Dr. S. Sowmyayami	Smart Business Using Embedded Age Gender Estimation Sensor at Security Gate	26/08/2022
8	Dr. C. Zozimus Divya Lobo	Chemical Structure Based Smart Investigation of Adverse Drug Reactions	30/12/2021

9	Dr. C. Zozimus Divya Lobo	Combination Treatments for Bacterial Infections Using Photochemical and Antibiotic Combinations	0402/2022
10	Dr. J. Antony Rajam	Design of Chitosan Nanoparticle Coated Mini-Implants for Dental **issues** and Analysis of Their Properties	30/12/2022
11	Dr. J. Antony Rajam	Designing A Nanostructured Photovoltaics on Solar Panels to Increase the Efficiency of Solar Energy Utilization	11/07/2022
12	Dr. T. Priyanka	Frame work for Sales Force Competence Model	05/11/2021
13	Ms. A. Amora	Frame work for Sales Force Competence Model	05/11/2021
14	Dr. G. Amala Jothi Garce	Tellurium Nanoparticles Using Conus Betulinus and it's applications	16/11/2022
15	Dr. A. Arockia Jenecius Alphonse	Tellurium Nanoparticles Using Conus Betulinus and it's applications	16/11/2022
16	Dr. P. Subavathy	Tellurium Nanoparticles Using Conus Betulinus and its applications	16/11/2022
17	Dr. A. Nirmala Shirley	Implementation of Techniques for Analysis of Photodetectors Embedded with Chemical Vapor Deposited Lead-Free Bismuth Mixed Halide Perovskite Films	07/04/2023
18	Dr. J. Antony Rajam	Implementation of Techniques for Analysis of Photodetectors Embedded with Chemical Vapor Deposited Lead-Free Bismuth Mixed Halide Perovskite Films	07/04/2023

Principal
St. Mary's College (Autonomous)
Thoothukudi-628 001.

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :13/08/2019

(21) Application No.201941032622 A
(43) Publication Date : 30/08/2019

(54) Title of the invention : SYNTHESIS OF VALUE ADDED MATERIALS BY BIOGENIC ROUTE FROM INDUSTRIAL POLLUTANTS

(51) International classification :C02F1/00
(31) Priority Document No :NA
(32) Priority Date :NA
(33) Name of priority country :NA
(86) International Application No :NA
Filing Date :NA
(87) International Publication No : NA
(61) Patent of Addition to Application Number :NA
Filing Date :NA
(62) Divisional to Application Number :NA
Filing Date :NA

(71)**Name of Applicant :**
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Address of Applicant :PG and Research Department of Chemistry, V.O Chidambaram College, Tuticorin, Tamilnadu, India-628008. Tamil Nadu India
2)Dr. C. Vedhi
3)Dr. Jessica Fernando
4)Dr. G. Amala Jothi Grace
5)Mr. G. Karthikeyan
(72)**Name of Inventor :**
1)Mr. P. Karpagavinayagam
2)Dr. C. Vedhi
3)Dr. Jessica Fernando
4)Dr. G. Amala Jothi Grace
5)Mr. G. Karthikeyan

(57) Abstract :
This invention accounts green route and an eco-friendly Iron oxide synthesis for environmental benefits. In the existing era, move with modern equipments and technology it adverse effects create environmental annoyance to society. Industries are producing materials, faster and cheaper however they struggle to facilitate waste materials at end. This invention assists to reduce harmfulness, impacts, etc. White Ti02 producing sectors produced more hazardous chemical sludge after treatment of wastewater. Industrial effluents contain iron enriched raw ore and sulphuric acid mixture. As connected with statutory body, sectors obey the rules and regulation for treatment system. But the sludge produced from the industries were not used for any applications. This biogenic route product provide a path for sludge treatment and it have many applications. FTIR spectroscopic studies confirms the presence of metal oxide in the product. FESEM figure representation reveals that materials are in micro to nano region range and have wide applications due to its low surface area. EDAX pattern confirms the presence of metal in the synthesized product. The proposed method also has an advantage in various areas like medicine, electric, electronic, paints etc. So this technique was strongly recommended for the betterment of society.

No. of Pages : 8 No. of Claims : 3

PATENT OFFICE
INTELLECTUAL PROPERTY BUILDING
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CHALLAN : TR-5
DOCKET NO:85699

Date/Time : 12/09/2022

To,
A. AROCKIA JENECIUS ALPHONSE
DEPARTMENT OF BOTANY, ST. MARY"S COLLEGE (AUTONOMOUS), THOOTHUKUDI-628001, TAMIL NADU, INDIA. smcjasbooks@gmail.com

Agent Number:

Sr. No.	CBR No.	Reference Number /Application Type	Application Number	Title/Remarks	Amount Paid
1	36466	ORDINARY APPLICATION	202241051885	HERBAL COSMETICS FOR SKIN CARE FORMULATION	1750
2		E-2/3966/2022-CHE	202241051885	Form2	0
3		E-3/28388/2022-CHE	202241051885	Form3	0
4		E-5/3634/2022-CHE	202241051885	Form5	0
Total :					1750

Received a sum of Rs. 1750 (Rupees One Thousand Seven Hundred & Fifty only) through

Payment Mode	Bank Name	Cheque/Draft Number	Cheque/Draft Date	Amount in Rs
Draft	The South Indian Bank Ltd	545375	01/09/2022	1750

Note: This is electronically generated receipt hence no signature required.

FORM 1 THE PATENTS ACT 1970 (39 of 1970) and THE PATENTS RULES, 2003 **APPLICATION FOR GRANT OF PATENT** (See section 7, 54 and 135 and sub-rule (1) of rule 20)			(FOR OFFICE USE ONLY)		
		Application No.			
		Filing date:			
		Amount of Fee paid:			
		CBR No:			
		Signature:			
1. APPLICANT'S REFERENCE/ IDENTIFICATION NO. (AS ALLOTTED BY OFFICE)					
2. TYPE OF APPLICATION [Please tick (✓) at the appropriate category]					
Ordinary (✓)		Convention ( )		PCT-NP ( )	
Divisional ( )	Patent of Addition ( )	Divisional ( )	Patent of Addition ( )	Divisional ( )	Patent of Addition ( )
3A. APPLICANT(S)					
Name in Full		Nationality	Country of Residence	Address of the Applicant	
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				Street	St.Mary's College
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				Country	India
				Pin code	638401
G.AMALA JOTHI GRACE		Indian	India	House No.	Department of Botany

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			City	Thoothukudi
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			Street	MUTHUPATTY
			City	Sivagangai
			State	Tamil Nadu
			Country	India
			Pin code	630561

3B. CATEGORY OF APPLICANT [Please tick (✓) at the appropriate category]

Natural Person (✓)	Other than Natural Person		
	Small Entity ( )	Startup( )	Others ( )

4. INVENTOR(S) [Please tick (✓) at the appropriate category]

Are all the inventor(s) same as the applicant(s) named above	Yes (✓)	No ( )

If "No", furnish the details of the inventor(s)

Name in Full	Nationality	Country of Residence	Address of the Inventor	
			House No.	
			Street	
			City	
			State	
			Country	

			Pin code	

5. TITLE OF THE INVENTION		
HERBAL COSMETICS FOR SKIN CARE FORMULATION		
6. ~~AUTHORISED REGISTERED PATENT AGENT(S)~~	~~IN/PA No.~~	
	~~Name~~	
	~~Mobile No.~~	
7. ADDRESS FOR SERVICE OF APPLICANT IN INDIA	Name	A. AROCKIA JENECIUS ALPHONSE
	Postal Address	Department of Botany, St.Mary's College (Autonomous), Thoothukudi - 628001, Tamil Nadu, India
	Telephone No.	04612320946
	Mobile No.	+917395897146
	Fax No.	04612320947
	E-mail ID	smcjasbooks@gmail.com

8. ~~IN CASE OF APPLICATION CLAIMING PRIORITY OF APPLICATION FILED IN CONVENTION COUNTRY, PARTICULARS OF CONVENTION APPLICATION~~

Country	Application Number	Filing date	Name of the applicant	Title of the invention	IPC (as classified in the convention country)

9. ~~IN CASE OF PCT NATIONAL PHASE APPLICATION, PARTICULARS OF INTERNATIONAL APPLICATION FILED UNDER PATENT CO-OPERATION TREATY (PCT)~~

International application number	International filing date

10. ~~IN CASE OF DIVISIONAL APPLICATION FILED UNDER SECTION 16, PARTICULARS OF ORIGINAL (FIRST) APPLICATION~~

Original (first) application No.	Date of filing of original (first) application

11. ~~IN CASE OF PATENT OF ADDITION FILED UNDER SECTION 54, PARTICULARS OF MAIN APPLICATION OR PATENT~~

Main application/patent No.	Date of filing of main application

12. DECLARATIONS

(i) Declaration by the inventor(s)

We, the above named inventor(s) are the true & first inventor(s) for this Invention and declare that the applicant(s) herein is/are my/our assignee or legal representative.

Date : 01.09.2022

Signature(s) : 

Name(s) A. AROCKIA JENECIUS ALPHONSE

Date : 01.09.2022

Signature(s) : 

Name(s) V. SATHISH

Date : 01.09.2022

Signature(s) : 

Name(s) G. AMALA JOTHI GRACE

Date : 01.09.2022

Signature(s) :

Name(s) P.SUBAVATHY

Date : 01.09.2022

Signature(s) :

Name(s) : LADISCA ROSELIN

(ii) Declaration by the applicant(s) in the convention country

I/We, the applicant(s) in the convention country declare that the applicant(s) herein is/are my/our assignee or legal representative.

Date : 01.09.2022

Signature(s) :

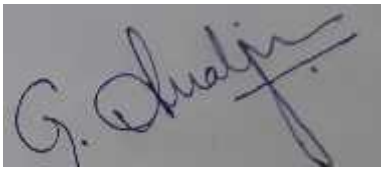
Name(s) A. AROCKIA JENECIUS ALPHONSE

Date : 01.09.2022

Signature(s) :

Name(s) V. SATHISH

Date : 01.09.2022



Signature(s) :

Name(s) G. AMALA JOTHI GRACE

Date : 01.09.2022

Signature(s) :

Name(s) P.SUBAVATHY

Date : 01.09.2022

Signature(s) : 

Name(s) : LADISCA ROSELIN

(iii) **Declaration by the applicant(s)**

We the applicant(s) hereby declare(s) that: -

We are in possession of the above-mentioned invention.

The provisional/complete specification relating to the invention is filed with this application.

The invention as disclosed in the specification uses the biological material from India and the necessary permission from the competent authority shall be submitted by me/us before the grant of patent to me/us.

There is no lawful ground of objection(s) to the grant of the Patent to me/us.

I am/we are the true & first inventor(s).

I am/we are the assignee or legal representative of true & first inventor(s).

The application or each of the applications, particulars of which are given in Paragraph-8, was the first application in convention country/countries in respect of my/our invention(s).

I/We claim the priority from the above mentioned application(s) filed in convention country/countries and state that no application for protection in respect of the invention had been made in a convention country before that date by me/us or by any person from which I/We derive the title.

My/our application in India is based on international application under Patent Cooperation Treaty (PCT) as mentioned in Paragraph-9.

The application is divided out of my /our application particulars of which is given in Paragraph-10 and pray that this application may be treated as deemed to have been filed on DD/MM/YYYY under section 16 of the Act.

The said invention is an improvement in or modification of the invention particulars of which are given in Paragraph-11.

13. FOLLOWING ARE THE ATTACHMENTS WITH THE APPLICATION

(a) Form 2

Item	Details	Fee	Remarks
Complete/ ~~provisional~~ specification)#	No. of pages: 12	Rs.1750/-	
No. of Claim(s)	No. of claims : 3 No. of pages : 1		
Abstract	No. of pages : 1		
No. of Drawing(s)	No. of drawings : 0 No. of pages : 0		

In case of a complete specification, if the applicant desires to adopt the drawings filed with his provisional specification as the drawings or part of the drawings for the complete specification under rule 13(4), the number of such pages filed with the provisional specification are required to be mentioned here.

(b) Complete specification (2 copies).

~~(c) Sequence listing in electronic form~~

(d) Drawings (in conformation with the international application)/as amended before the International Preliminary Examination Authority (IPEA), as applicable (2 copies).

~~(e) Priority document(s) or a request to retrieve the priority document(s) from DAS (Digital Access Service) if the applicant had already requested the office of first filing to make the priority document(s) available to DAS.~~

~~(f) Translation of priority document/Specification/International Search Report/International Preliminary Report on Patentability.~~

(g) Statement and Undertaking on Form 3 (2Copies)

(h) Declaration of Inventorship on Form 5

(i) ~~Power of Authority~~

(j) Request for Publication on Form 9 (2 Copies)

(k)Request for Examination on Form 18 (2 Copies)

Total fee **Rs. 1,750/-** in Bank Draft bearing No 545375 Date on 01.09.2022 in South Indian Bank, Tuticorin branch.

We hereby declare that to the best of my/our knowledge, information and belief the fact and matters slated herein are correct and I/We request that a patent may be granted to me/us for the said invention.

Dated this 1st day of September month 2022

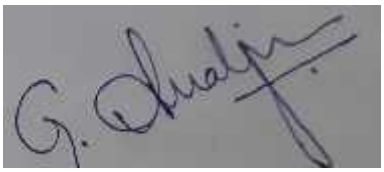
Arockia Jenecius Alphonse

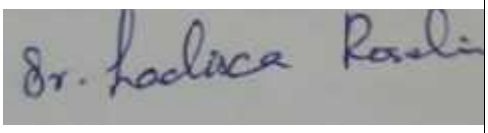
A. AROCKIA JENECIUS ALPHONSE

(Applicant)

V. SATHISH

(Applicant)





G. AMALA JOTHI GRACE	P.SUBAVATHY	LADISCA ROSELIN
(Applicant)	(Applicant)	(Applicant)

To,

The Controller of Patents

The Patent Office, at Chennai.

Note: -

* Repeat boxes in case of more than one entry.
* To be signed by the applicant(s) or by authorized registered patent agent otherwise where mentioned.
* Tick (✓)/cross (x) whichever is applicable/not applicable in declaration in paragraph-12.
* Name of the inventor and applicant should be given in full, family name in the beginning.
* Strike out the portion which is/are not applicable.
* For fee: See First Schedule";

FORM 2

THE PATENT ACT, 1970

(39 of 1970)

&

The Patents Rules, 2003

COMPLETE SPECIFICATION

(See Section 10; rule 13)

1. **TITLE OF THE INVENTION** : HERBAL COSMETICS FOR SKIN CARE FORMULATION

2. **APPLICANT (S)**
   a. NAME:
      1. A. AROCKIA JENECIUS ALPHONSE
      2. V. SATHISH
      3. G. AMALA JOTHI GRACE
      4. P.SUBAVATHY
      5. LADISCA ROSELIN
   b. NATIONALITY : Indian
   c. ADDRESS :

3. **PREAMBLE TO THE DESCRIPTION**

PROVISIONAL	**COMPLETE**
The following specification describes the invention.	The following specification particularly describes the invention and the manner in which is to be performed.

4. DESCRIPTION (Description shall start from next page.)

ANNUXURE I

5. CLAIMS (not applicable for provisional specification. Claims should start with the preamble – **"We claim"** on separate page)

ANNUXURE II

6. DATE AND SIGNATURE (To be given at the end of last page of specification)
7. ABSTRACT OF THE INVENTION (to be given along with complete specification on separate page) **ANNUXURE III**

ANNUXURE I

4. DESCRIPTION

Field of invention

The present invention involved preparation and evaluation of herbal cosmetics for skin care formulation.

Objective of the invention

This objective of the invention contains

(i) Preparation of herbal cosmetics

(ii) The herbal formulation was evaluated by different parameters like organoleptic properties, physico-chemical parameters and stability along with irritancy test, microbial load, *in vitro* and *in vivo* studies.

(iii) Antibacterial, antioxidant, anti-allergic and anti-inflammatory properties with applications in the treatment of skin allergic reactions has been studied with herbal cosmetics

(iv) Efficient glowing effect on skin has been verified

Background of the invention

Cosmetics are used worldwide and are available in various formulations such as shampoo, creams, lotions etc to make a human being more attractive. Herbal cosmetics contains phytochemicals which are harmless. The nutrients present in the composition help us to enrich our skin glow. Herbal cosmetics are eco-friendly cosmetics and are less expensive. WHO is filtering out medicinal services projects to benefit such items at lower costs with more esteem and safety. Herbal cosmetics provide us important biological function and give us healthy skin. Herbal composition contains vitamins, antioxidants, essential oils, proteins etc. Herbal composition increases the fairness and smoothness of skin. Herbal cosmetics are the formulations, which are associated with bioactive ingredients. Herbal formulations are used to

purify and beautify the skin. The main advantage of using herbal products is that it is pure and does not have any side effects on the human body. According to Ayurveda, skin problems are occurring due to the presence of impurities in the blood. Normally, the herbal formulations are applied to treat acne, pimple, scars, marks and pigments are known as "Mukha lepa" in Ayurveda. This beauty therapy is now popularly termed as facial [3].

Herbal packs usually control the rate of sebum discharge from sebaceous glands and fight the harmful bacteria present inside acne lesion. Herbal packs are being used on large scale, because of the various benefits when compared with the chemical-based packs. They are non-toxic, non-allergic and there are no adverse side effects. They are natural in every aspect, having large shelf lives. There are no added preservatives and they can be easily formulated and stored over a larger span of time [2]. Natural and home remedies are widely acceptable in the belief that they are safer with fewer side effects than the synthetic materials. Herbal cosmetics are used to stimulate blood circulation, rejuvenate the muscle and help to maintain the elasticity of the skin and remove dirt from skin pores. The benefits of using herbal cosmetics are ecofriendly.

Materials and Methods:

The natural ingredients such as Green gram, Bengal gram, Wild turmeric, Zedoary, Fenugreek, Calamus, Lemon and Rose Flower. The samples required for this work are taken from the garden in Servite Convent, Annai Nalavazhvu Illam Siddha Hospital, Muthupatty, Sivagangai, Tamil Nadu, India.

All powdered natural ingredients were sieved using #120 mesh, weighed accurately and mixed geometrically for uniform formulation and then evaluated for parameters including organoleptic, physicochemical, physical, phytochemical, irritancy along with stability examination. The dried powder of combined form had passable flow property.

The materials required for determining the properties are given below.

Turmeric

Turmeric has been used in the formulation due to antiseptic action. It cures skin diseases occurring due to blood impurities. It is a very good anti-inflammatory and antiallergic agent. The phytoconstituents, mainly terpenoids present in it, helps to lighten the skin tone. Turmeric delays

the signs of aging like wrinkles and improves skin elasticity. It cures pigmentation, uneven skin tone and dull skin.

Green gram

Green gram rejuvenates the skin by nourishing and exfoliating it. It removes the dead cells of skin and brightens up the texture of the skin. It is rich in vitamin A and C that helps in giving a healthy glow to the skin.

Bengal gram

The high content of Zinc in gram flour will help to fight infections that cause acne. It removes dead skin and is protective. Gram flour is widely used as house remedies for facial and marriage haldi functions also .

Rose petals powder

Rose petals powder is rich with antibacterial properties, all with the positive effects of vitamin K, C and B. It also has a good amount of antioxidants [(6)].

Lemon peel powder

It works as a natural skin whitening agent that helps to do away with marks, blemishes, and spots pigmentation. lemon peels are high on vitamin C and comes with exfoliating properties that in addition, helps a degree of fairness to the skin in the most natural manner [(7)].

Zedoary

White Turmeric popularly called Poolankilangu, Kachur and Zedoary has wonderful medicinal uses and health benefits. It is used extensively for face and skin care for treating acne and pigmentation and it also removes unwanted hair. Poolankilangu is used extensively for skin care for babies. It prevents all skin infections and it also makes the bath powder smell very nice.

Fenugreek

Fenugreek powder can be used for a number of skin-related concerns, from cleaning and moisturising to treating pimples. They contain a rich source of fibre, fat, iron, manganese, copper, magnesium, phosphorus, and vitamin B6. The vitamin C helps to enhance complexion and fight premature aging. It has a natural nutritional combination that controls oil production,

protects the skin from free radicals and adds a natural radiance to the skin. It hydrates the skin and protects against fungal infections. Fenugreek seeds have been shown to possess significant amount of anti-inflammatory and antibacterial properties.

Calamus

It helps to prevent skin infections. It is also effective in treating pain and swelling. It has good insecticidal and anti-microbial properties.

Composition of Skin Care Powder:

Table 1

Constituents	**Scientific Name**	**Family Name**	**Composition**
Turmeric	***Curuma longa***	**Zingiberaceae**	**100g**
Green gram	***Phaseolus radiatus***	**Fabaceae**	**1kg**
Bengal gram	***Cicer arietinum***	**Fabaceae**	**250g**
Rose petals	***Rosa indica***	**Rosaceae**	**50g**
Lemon peel	***Citrus limon***	**Rutaceae**	**50g**
Zedoary	***Curcuma zedoaria***	**Zingiberaceae**	**100g**
Fenugreek	***Trigonella foenum-graecum***	**Fabaceae**	**100g**
Calamus	***Acorus calamus***	**Acoraceae**	**10g**

The above ingredients are dried under sunlight. The ingredients are then grounded to make a fine powder.

Organoleptic Evaluation

It refers to the evaluation of the herbal pack by its color, odor, appearance, texture etc. The external characters of the formulation were examined.

Physicochemical evaluation

Physicochemical properties such as ash value, pH and moisture content were determined.

Ash Content: Ash content of the sample was determined by taking 2 gm of sample into the crucible and the weight was noted. Place crucible in muffle furnace oven at 5500c for 24 hrs. Turn off the muffle furnace and allow it to cool (might take a few hours) Remove crucible from the muffle furnace and placed into a desiccator to cool. Weigh the ashed sample and record weight of crucible plus ashed sample.

% Ash = (Weight of Ash / Original Sample Weight) × 100

pH Value: pH of the sample was determined by dissolving 1g of the sample in 100 mL water. After one hour, pH was determined by taking aqueous solution of the sample. pH at 7 indicates the neutral condition of the sample.

Moisture Content: Determination of moisture content is important for the plant drugs because insufficient drying may lead to possible enzymatic deterioration of active principles. Weigh accurately about 3 gms of powder and it was taken in Petridish and placed in hot air oven and measure the weight after 30 min upto standard weight.

% Moisture = (Wet Weight - Dry Weight / Wet Weight) × 100

Hygroscopic nature of the powder is confirmed by it's moisture content value.

Physical evaluation

The particle size was tested by microscopy method. The flow property of the dried powder of combined form was evaluated by performing Angle of Repose by Funnel Method, Bulk Density, Tapped Density by Tapping Method, Hausner's Ratio and Carr's Index [(8)].

Angle of repose: The friction forces in a loose powder can be measured by the angle of repose. It is an indicative of the flow properties of the powder. It is defined as maximum angle possible between the surface of the pile of powder and the horizontal plane. The powder mixture was allowed to flow through the funnel fixed to a stand at definite height (h).The angle of response was then calculated by measuring the height and radius of the heap of powder formed. Care was

taken to see that the powder particles slip and roll over each other through the sides of the funnel. Relationship between angle of repose and powder flow property.

$$\text{Tan } \theta = h/r$$

Where, θ = angle of repose, h = height of the cone, r = radius of the base

Bulk Density (Db): It is the ratio of total mass of powder to the bulk volume of powder. It was measured by pouring the weight powder (Passed through standard sieve #20) into a measuring cylinder and initial weight was noted. This initial volume is called the bulk volume. From this the bulk density is calculated according to the formula mentioned below it is expressed in g/ml and is given by,

$$Db = M/Vb$$

where, M= the mass of powder Vb = the bulk Volume of the powder

Tapped Density (Dt): It is the ratio of total mass of the powder to the tapped volume of the powder. Volume was measured by tapping for 750 times and the tapped volume was noted if the difference between these two volumes is less than 20%. If it is more than 2%, tapping is continued 1250 times and tapped volume is noted. Tapping was continued until the differences between successive volumes is less than 2% (in a bulk density apparatus)it is expressed in g/ml and is given by

$$Dt = M/ Vt$$

where, M= the mass of the powder Vt = the tapped volume of powder

Carr's index or % Compressibility: It indicates powder flow properties. It is expressed in percentage and is given by,

$$I = Dt - Db / Dt \times 100$$

where, Dt = the tapped density of the powder, Db = the bulk density of the powder

Hausner's ratio: Hausner ratio is an indirect index of ease of powder flow. It is calculated by the following formula

$$\text{Hausner's ratio} = Dt/Db$$

Phytochemical evaluation

The aqueous extract of the herbal face pack was evaluated for the presence of different phytoconstituents as per the standard procedures [(9)].

Irritancy test

Mark an area (1sq.cm) on the left-hand dorsal surface. Definite quantities of prepared face packs were applied to the specified area and time was noted. Irritancy, erythematic, edema was checked if any for regular intervals up to 24 hrs and reported [10].

Stability studies

Stability testing of prepared formulation was conducted by storing at different temperature conditions for the period of one month. The packed glass vials of formulation stored and were evaluated for physical parameters like color, odour, pH, consistency and feel at 40°C.

Antibacterial Property

Herbal skin pack formulation was tested for antibacterial activity against test organisms namely *Staphylococcus aureus*, *Streptococcus pyogenes*, Coryneform bacteria. In this method, nutrient agar plates and reinforced clostridial agar (RCA) were seeded with 100 micro liter standardized bacterial suspension. After optimization of dose, 200 mg of formulation was mixed with distilled water and poured into the wells. Standard conditions and antibacterial activity was evaluated by measuring the diameter of Zones of inhibition (mm) including cupsize. The experiments were repeated thrice [12, 13].

Antioxidant Capacity

DPPH radical scavenging assay

Free radical scavenging ability of the extracts was tested by DPPH radical scavenging assay as described by Blois [14] and Desmarchelier *et al*. [15]. The hydrogen atom donating ability of the plant extractives was determined by the decolorization of methanol solution of 2,2-diphenyl-1-picrylhydrazyl (DPPH). DPPH produces violet/purple color in methanol solution and fades to shades of yellow color in the presence of antioxidants. A solution of 0.1 mM DPPH in methanol was prepared, and 2.4 mL of this solution was mixed with 1.6 mL of extract in methanol at different concentrations (12.5–150 μg/mL). The reaction mixture was vortexed thoroughly and left in the dark at RT for 30 min. The absorbance of the mixture was measured spectrophotometrically at 517 nm. BHT was used as reference. Percentage DPPH radical scavenging activity was calculated by the following equation:

% DPPH radical scavenging activity=$\{(A_0 - A_1)/A_0\} \times 100$

where A_0 is the absorbance of the control, and A_1 is the absorbance of the extractives/standard. Then % of inhibition was plotted against concentration, and from the graph IC_{50} was calculated. The experiment was repeated three times at each concentration.

Results and Discussion

Evaluation of herbal pack

Organoleptic Evaluation

Herbal pack was evaluated for organoleptic parameters shown in the Table 2. The colour of formulation was yellow. The odour of prepared formulations was pleasant and good acceptable which is desirable to cosmetic formulations. Texture and smoothness was acceptable as per requirement of cosmetic formulations.Yellowish sample with pleasant smell and fine texture shows good flow property.

Table 2: Organoleptic Evaluation

Parameter	Observation
Colour	Yellow
Odour	Pleasant
Appearance	Fine
Texture	Fine
Smoothness	Smooth

Physicochemical evaluation

Herbal pack was evaluated for physicochemical parameters shown in the Table 3. The pH of formulation was found to be neutral. The ash content and moisture content were within limit. The percentage of ash content was found to be 3.3 and moisture content was observed as 4.1.

Table 3: Physicochemical Evaluation

Parameter	Observation
pH	7

Ash Content	3.3%
Moisture Content	4.1%

Physical evaluation (Property of powder)

Herbal pack was evaluated for physical parameters (powder property) shown in the Table 4. Rheological findings justified the flow (powder) properties of the herbal pack. It was found to be free-flowing and non-sticky in nature.

Table 4:Physical Evaluation

Parameter	Observation
Angle of Repose	23.96
Bulk Density	1.99
Tapped density	2.07
Hausner’s ratio	1.04
Carr’s index	3.86

Phytochemical evaluation

Herbal face pack was evaluated for phytochemical parameters shown in the Table 5. It was found to be a presence of phytoconstituents such as carbohydrates, alkaloids, glycosides, phenolics, flavonoids, tannin, volatile oil.

Table 5:Phytochemical Evaluation

Phytoconstituents	Observation
Carbohydrates	+
Alkaloids	+
Glycosides	+
Phenolics	+
Flavonoids	+

Tannin	+
Volatile oil	+

Irritancy test

The results of irritancy test were shown in Table 6. The formulation showed absence of irritation, erythema and edema during irritancy studies. This formulation is safe to use on skin.

Table 6: Irritancy Evaluation

Parameter	Observation
Irritation	NIL
Erythema	NIL
Edema	NIL

Stability studies

The results of stability were shown in Table 7. No change in color, odour, texture and smoothness was observed at mentioned conditions of stability except pH. The stability studies showed a slight change in pH.

Table 7: Stability Evaluation

Parameter	**Observation Room Temperature**	**Observation** 40°C
Color	No change	No change
Odour	No Change	No Change
pH	7.1	7.2
Texture	Fine	Fine
Smoothness	Smooth	Smooth

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Brief Description of the Drawing

Nil

Detailed Description of the Invention

Natural and home made remedies are more acceptable because they are cheaper and safe without adverse side effects. Herbal skin packs are considered as a sustaining and productive way to advance the appearance of skin. Thus in the present work, herbal formulations have been prepared which are obtaining demand in the global market. It is our good attempt to formulate the herbal skin pack containing natural ingredients such as Green gram (*Phaseolus radiatus*), Bengal gram (*Cicer arietinum*), Wild turmeric (*Curcuma aromatica*), Zedoary (*Curcuma zedoaria*), Fenugreek (*Trigonella-foenum graecum*), Calamus (*Acorus calamus*), Lemon (*Citrus*) and Rose Flower (*Rosa indica*). After organoleptic, physical and phytochemical evaluation the herbal pack showed good consistency, stability and glowing effect on the skin. The herbal pack also exhibits pronounced antibacterial, antioxidant, anti-allergic and anti-inflammatory properties with applications in the treatment of skin allergic reactions. Results of this study scientifically verified that herbal packs proved enough potential to give an efficient glowing effect on skin. We can use herbal formulation for most complicated diseases and save humans from the effect of synthetic preparations

ANNUXURE II

5. We Claims

1. Herbal cosmetics is more effective than other individual natural ingredients mentioned.
2. It exhibits antibacterial, antioxidant, anti-allergic and anti-inflammatory properties with applications in the treatment of skin allergic reactions.
3. The potential of glowing effect on skin is high.

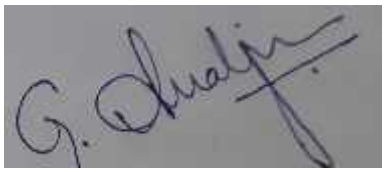
Dated this 01.09.2022

Signature: 

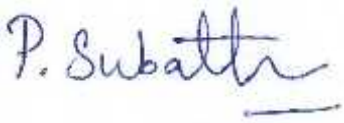
A. AROCKIA JENECIUS ALPHONSE

Signature: 

V. SATHISH

Signature: 

G. AMALA JOTHI GRACE

Signature: 

P.SUBAVATHY

Signature: 

LADISCA ROSELIN

ANNUXURE III

7. ABSTRACT OF THE INVENTION

Herbal cosmetics are safe to use as compared to chemical-based cosmetics. Herbal formulations are healthy formulations as they are non-toxic to the skin. The bioactive agents from plants include antioxidants, vitamins, essential oils, tannins, alkaloids, dyes, carbohydrates and terpenoids, which are used as cosmetics for care of skin, body and its other parts. The main objective of this work is to prepare and evaluate the herbal skin care formulation from the herbal ingredients. Green gram (*Phaseolus radiatus*), Bengal gram (*Cicer arietinum*), Wild turmeric (*Curcuma aromatica*), Zedoary (*Curcuma zedoaria*), Fenugreek (*Trigonella-foenum graecum*), Calamus (*Acorus calamus*), Lemon (*Citrus*) and Rose Flower (*Rosa indica*) were sun dried and grounded in fixed proportion. All powdered herbal ingredients were sieved using 120 mesh, weighed accurately and mixed geometrically for uniform formulation and then evaluated. The herbal formulation was evaluated by different parameters like organoleptic properties, physico-chemical parameters and stability along with irritancy test, microbial load, *in vitro* and *in vivo* studies. So, in the present study we formulate herbal packs by using easily available ingredients. After evaluation, we found good flow properties, free from skin irritation and maintained proper stability storage conditions..

FORM 3

THE PATENTS ACT, 1970

(39 of 1970)

and

THE PATENTS RULES, 2003

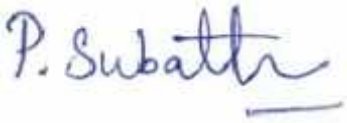
STATEMENT AND UNDERTAKING UNDER SECTION 8

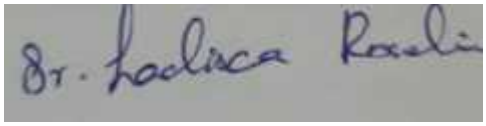
(See section 8; Rule 12)

1. Name of the applicant(s).	**We A. AROCKIA JENECIUS ALPHONSE, V. SATHISH, G. AMALA JOTHI GRACE, P.SUBAVATHY, LADISCA ROSELIN** hereby declare:
2. Name, address and nationality of the joint applicant.	(i) that We have not made any application for the same/substantially the same invention outside India ~~Or~~ ~~(ii) that I/We who have made this application No……dated~~ ……..alone/jointly ~~with ……., made for the same/ substantially same invention, application(s) for patent in the other countries, the particulars of which are given below:~~

Name of the country	Date of application	Application No.	Status of the application	Date of publication	Date of grant
NONE					

3. Name and address of the assignee	(iii) that the rights in the application(s) has/have been assigned to NONE

	(iv)that We undertake that upto the date of grant of the patent by the Controller, We would keep him informed in writing the details regarding corresponding applications for patents filed outside India within six months from the date of filing of such application. Dated this 01st September 2022
4. To be signed by the applicant or his authorized registered patent agent.	Signature. ……  A. AROCKIA JENECIUS ALPHONSE (Applicant)  V. SATHISH (Applicant)  G. AMALA JOTHI GRACE (Applicant)  P.SUBAVATHY (Applicant)

	 LADISCA ROSELIN (Applicant)
5. Name of the natural person who has signed.	(……).
	To The Controller of Patents, The Patent Office, At Channai
Note.- Strike out whichever is not applicable;	

FORM 5
THE PATENT ACT, 1970
(39 OF 1970)
&
The Patent Rules, 2003
DECLARATION AS TO INVENTORSHIP
[See section 10(6) and rule 13(6)]

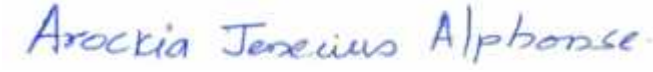
1.NAME OF APPLICANT (S)	**1. A. AROCKIA JENECIUS ALPHONSE** **2. V. SATHISH** **3. G. AMALA JOTHI GRACE** **4. P.SUBAVATHY** **5. LADISCA ROSELIN**

Hereby declare that true and first inventor(s) of the invention disclosed in the complete specification filed in pursuance of my / our application numbered…… filed on 01 September 2022 are

2. INVENTOR(S)

Sl.No	Inventor Name	Address	Nationality
1	**A. AROCKIA JENECIUS ALPHONSE**	Department of Botany, St.Mary's College (Autonomous), Thoothukudi - 628001, Tamil Nadu, India.	Indian
2	**V. SATHISH**	Department of Chemistry, Bannari Amman Institute of Technology, Sathyamangalam - 638401,Tamil Nadu, India.	
3	**G. AMALA JOTHI GRACE**	Department of Chemistry, St.Mary's College (Autonomous), Thoothukudi - 628001,Tamil Nadu, India.	
4	**P.SUBAVATHY**	Department of Zoology, St.Mary's College (Autonomous), Thoothukudi– 628001,Tamil Nadu, India.	
5	**LADISCA ROSELIN**	Servite Convent, Annai Nalavazhvu Illam Siddha Hospital, Muthupatty, Sivagangai, Tamil Nadu, India.	

Dated this 01 September 2022

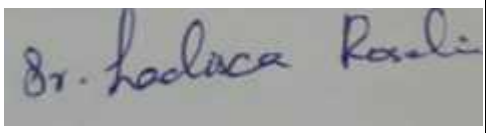


A. AROCKIA JENECIUS ALPHONSE

(Applicant)

V. SATHISH

(Applicant)



G. AMALA JOTHI GRACE ROSELIN	P.SUBAVATHY	LADISCA
(Applicant)	(Applicant)	(Applicant)

Signature:-

3. Declaration to be given when the application in India filed by the applicant in the convention country:
We, the applicant(s) in the convention country hereby declare that our right to apply for a patent in India is by way of assignment from and first inventor(s).
Dated this 1st September 2022

Signature:-

4. Statement :
I/We assent to the invention referred to in the above declaration, being included in the complete specification filled in pursuance of the stated application.
Dated this 31 day of December 2019

Signature of the additional inventor(S):-

To,
The Controller of Patents,
The Patent Office,
at Chennai

Note: -

* Repeat boxes in case of more than one entry.
* To be signed by the applicant(s) or by authorized registered patent agent otherwise where mentioned.
* Tick ( )/cross(x) whichever is applicable/not applicable in declaration in paragraph-12.
* Name of the inventor and applicant should be given in full, family name in the beginning.
* Strike out the portion which is/are not applicable.

For fee: See First Schedule

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :14/07/2021

(21) Application No.202141031521 A
(43) Publication Date : 16/07/2021

(54) Title of the invention : IOT BASED NEW DEVICE FOR DAIRY COW BODY CONDITION SCORING SYSTEM

(51) International classification	:A23K0050100000, A01K0029000000, A61D0017000000, G06Q0050020000, G06Q0050100000
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(32) Priority Date	:NA
(33) Name of priority country	:NA
(86) International Application No Filing Date	:NA :NA
(87) International Publication No	: NA
(61) Patent of Addition to Application Number Filing Date	:NA :NA
(62) Divisional to Application Number Filing Date	:NA :NA

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2)Dr. P. Arockia Jansi Rani
(72)**Name of Inventor :**
1)Dr. S. Sowmyayani
2)Dr. P. Arockia Jansi Rani

(57) Abstract :
ABSTRACT Healthcare of dairy cows is more important as all people will consume milk daily. Proper caring and feeding should be given to the cows that are very thin and very obese. Special care should be given during breeding, weaning and lactating time. The producer should increase the energy reserves of the cows before 90 days of calving. Capturing various parts of the cows and estimating BCS manually or digitally using a digital cameras is a time-consuming task. Also, this manual estimation of BCS is difficult and may lead to error. There is a drastic development in this digital world. Everything is automated using Internet of Things. There are number of sensors for various applications which are connected with some electronic devices. We use IoT technology for estimating BCS measure for dairy cows to help producers to easily estimate the BCS measure. The sensor reduces the manual estimation of BCS and helps to increase accuracy. BCS sensors can be placed at different parts of the cow™s body. The sensor replaces the manual image capturing using 3D digital camera. The score that is calculated by the IoT based BCS sensor helps the producers to identify the energy reserves of the dairy cows, to maximize milk production and reproduction efficiency; also, it is used to reduce the incidence of disease affection.

No. of Pages : 12 No. of Claims : 6

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :10/08/2022

(21) Application No.202241045571 A
(43) Publication Date : 26/08/2022

(54) Title of the invention : SMART BUSINESS USING EMBEDDED AGE AND GENDER ESTIMATION SENSOR AT SECURITY GATES

(51) International classification	:G06Q0030020000, G06K0009000000, G01N0033574000, G06Q0030000000, G06Q0010100000
(86) International Application No Filing Date	:PCT// :01/01/1900
(87) International Publication No	: NA
(61) Patent of Addition to Application Number Filing Date	:NA :NA
(62) Divisional to Application Number Filing Date	:NA :NA

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2)Dr. P. Arockia Jansi Rani
Address of Applicant :Associate Professor, Department of Computer Science and Engineering, Manonmaniam Sundaranar University, Tirunelveli, Tamilnadu. ---------- ----------

(57) Abstract :
ABSTRACT Smart business using Embedded Age and Gender Estimation Sensor at Security Gates The present disclosure relates to smart business using embedded age and gender estimation sensor at security gates. The application of an Embedded Age and Gender Estimation Sensor at the security gate of supermarkets and shopping centers to advance smart business is the field of invention. A smart device determines a person's age and gender installed outside a store or mall to obtain age and gender information of customers. Understanding traits and interests of the consumer is the key to a business's success. It leads to a smart business practice. The firm will grow if the purchasing habits of a specific customer age group can be predicted while also different gender choices are understood. The suggested embedded sensor-based computing device can also be used to identify the type of disease for different age groups of people in hospitals and to identify offenders of a certain age group at airports and train stations.

No. of Pages : 17 No. of Claims : 6

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PATENTS | DESIGNS | TRADE MARKS
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GOVERNMENT OF INDIA

Controller General of Patents,Designs and Trademarks
Department of Industrial Policy and Promotion
Ministry of Commerce and Industry

Application Details

APPLICATION NUMBER	201941043621
APPLICATION TYPE	ORDINARY APPLICATION
DATE OF FILING	26/10/2019
APPLICANT NAME	1 . Dr. Debabrata Samanta 2 . Dr. Nismon Rio R 3 . Dr. Ramkumar K 4 . Dr. Viswambari M 5 . Dr. Vithya Vijayalakshmi A 6 . Dr. Delman A
TITLE OF INVENTION	BIOMETRICALLY ACTIVATED SELF DEFENSE DEVICE FOR WOMEN SAFETY
FIELD OF INVENTION	COMMUNICATION
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ADDITIONAL-EMAIL (As Per Record)	debabrata.samanta369@gmail.com
E-MAIL (UPDATED Online)	
PRIORITY DATE	NA
REQUEST FOR EXAMINATION DATE	--
PUBLICATION DATE (U/S 11A)	01/11/2019

Application Status

APPLICATION STATUS	Application Published

View Documents

पेटेंट कार्यालय
शासकीय जर्नल

OFFICIAL JOURNAL
OF
THE PATENT OFFICE

निर्गमन सं. 49/2021	शुक्रवार	दिनांक: 03/12/2021
ISSUE NO. 49/2021	FRIDAY	DATE: 03/12/2021

पेटेंट कार्यालय का एक प्रकाशन
PUBLICATION OF THE PATENT OFFICE

INTRODUCTION

In view of the recent amendment made in the Patents Act, 1970 by the Patents (Amendment) Act, 2005 effective from 01st January 2005, the Official Journal of The Patent Office is required to be published under the Statute. This Journal is being published on weekly basis on every Friday covering the various proceedings on Patents as required according to the provision of Section 145 of the Patents Act 1970. All the enquiries on this Official Journal and other information as required by the public should be addressed to the Controller General of Patents, Designs & Trade Marks. Suggestions and comments are requested from all quarters so that the content can be enriched.

(Shri Rajendra Ratnoo)
CONTROLLER GENERAL OF PATENTS, DESIGNS & TRADE MARKS

3rd DECEMBER, 2021

CONTENTS

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KOLKATA, 03/12/2021
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The following are addresses of all the Patent Offices located at different places having their Territorial Jurisdiction on a Zonal basis as shown below:-

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2	The Patent Office, Government of India, Boudhik Sampada Bhavan, Near Antop Hill Post Office,S.M.Road,Antop Hill, Mumbai – 400 037 Phone: (91)(22) 24137701 Fax: (91)(22) 24130387 E-mail: mumbai-patent@nic.in ❖ The States of Gujarat, Maharashtra, Madhya Pradesh, Goa and Chhattisgarh and the Union Territories of Daman and Diu & Dadra and Nagar Haveli	5	The Patent Office (Head Office), Government of India, Boudhik Sampada Bhavan, CP-2, Sector –V, Salt Lake City, Kolkata- 700 091 Phone: (91)(33) 2367 1943/44/45/46/87 Fax: (91)(33) 2367 1988 E-Mail: kolkata-patent@nic.in ❖ Rest of India
3	The Patent Office, Government of India, Boudhik Sampada Bhavan, Plot No. 32., Sector-14, Dwarka, New Delhi – 110075 Phone: (91)(11) 25300200 & 28032253 Fax: (91)(11) 28034301 & 28034302 E.mail: delhi-patent@nic.in ❖ The States of Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab, Rajasthan, Uttar Pradesh, Uttaranchal, Delhi and the Union Territory of Chandigarh.		

Website: www.ipindia.nic.in

All applications, notices, statements or other documents or any fees required by the Patents Act, 1970 and The Patents (Amendment) Act, 2005 or by the Patents (Amendment) Rules, 2006 will be received only at the appropriate offices of the Patent Office.

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पेटेंट कार्यालय

कोलकाता, दिनांक 03/12/2021

• कार्यालयों के क्षेत्राधिकार के पते

विभिन्न जगहों पर स्थित पेटेंट कार्यालय के पते आंचलिक आधार पर दर्शित उनके प्रादेशिक अधिकार क्षेत्र के साथ नीचे दिए गए है:-

1	कार्यालय : महानियंत्रक, एकस्व, अभिकल्प तथा व्यापार चिहन, एंटोप हिल डाकघर के समीप, एस. एम. रोड, एंटोप हिल, मुम्बई- 400 037, भारत, फोन: (91) (22) 24123311 फ़ैक्स: (91) (22) 24123322 ई. मेल: cgpdtm@nic.in	4	पेटेंट कार्यालय, भारत सरकार इंटेलेक्चुअल प्रॉपर्टी राइट्स बिल्डिंग, इंडस्ट्रियल इस्टेट एसआईडीसीओ आरएमडी गोडाउन एरिया एडजसेन्ट टु ईगल फ्लास्क, जी. एस. टी. रोड, गायन्डी चेन्नई - 600 032. फोन: (91)(44) 2250 2081-84 फ़ैक्स: (91)(44) 2250-2066 ई. मेल: chennai-patent@nic.in ❖ आन्ध्र प्रदेश, तेलंगाना, कर्नाटक, केरल, तमिलनाडु तथा पुडुचेरी राज्य क्षेत्र एवं संघ शासित क्षेत्र, लक्षदीप
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वेबसाइट: http://www.ipindia.nic.in

पेटेंट अधिनियम, 1970 तथा पेटेंट (संशोधन) अधिनियम, 2005 अथवा पेटेंट (संशोधन) नियम, 2006 द्वारा वांछित सभी आवेदन, सूचनाए, विवरण या अन्य दस्तावेज़ या कोई शुल्क पेटेंट कार्यालय के केवल उपयुक्त कार्यालय में स्वीकृत होंगे।
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18 Months publication as required under Section 11A of the Patents Act, 1970 as amended by the Patents (Amendment) Act, 2005.

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(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :18/11/2021

(21) Application No.202141053173 A
(43) Publication Date : 03/12/2021

(54) Title of the invention : CHEMICAL STRUCTURE BASED SMART INVESTIGATION OF ADVERSE DRUG REACTIONS

(51) International classification :G06K0009620000, G16C0020300000, G06N0020000000, G16B0040000000, G16B0020000000
(86) International Application No :NA
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(61) Patent of Addition to Application Number :NA
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(57) Abstract :
In the development of drug design, identification of side effects of the drug is the significant step as success of a drug developed, depends not only medication provided by it but also on the minimal side effects of the drug. In this invention, we investigate the potential side effects of a newly developed drug based on their chemical structure based machine learning. Prediction of drug side effects by the preliminary model of Regularized Regression provides promising features such as existence of closed form solution and high efficiency of model training. This model performs better than conventional method in terms of accuracy but to investigate the drug side effects still deeper, we propose a weighted Generalized T-Student Kernel Support Vector Machine (SVM) model in the perspective to minimize structural risk of the drug. In the process of developing a drug, the proposed SVM model is able to understand the side effects of the drug in a better way. Centralized database availing side effects of the drugs in usage can be updated directly from the results obtained from the proposed model as it shed light over unidentifiable side effects by other models and also provides suggestions for removal of distinguished chemical structures.

No. of Pages : 12 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :24/01/2022

(21) Application No.202241004044 A
(43) Publication Date : 04/02/2022

(54) Title of the invention : Combination treatments for bacterial infections using photochemical and antibiotic combination

(51) International classification :A61L0002000000, A61M0001360000, A61B0017000000, A61L0027580000, C12N0007000000
(86) International Application No Filing Date :PCT// :01/01/1900
(87) International Publication No : NA
(61) Patent of Addition to Application Number ,Filing Date :NA :NA
(62) Divisional to Application Number Filing Date :NA :NA

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(57) Abstract :
The treatment of biological compositions with psoralen derivatives under irradiation conditions, during which the proteins retain their original physiological activities and any polynucleotide present is rendered inactive, results in the removal of functional polynucleotides from the biological composition.

No. of Pages : 14 No. of Claims : 5

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शासकीय जर्नल

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(19) INDIA

(22) Date of filing of Application :09/12/2022

(21) Application No.202241071287 A

(43) Publication Date : 30/12/2022

(54) Title of the invention : DESIGN OF CHITOSAN NANOPARTICLE COATED MINI-IMPLANTS FOR DENTAL ISSUES AND ANALYSIS OF THEIR PROPERTIES

(51) International classification :A61K0009510000, B82Y0005000000, A61B0005000000, B01J0035000000, A61K0047690000

(86) International Application No :PCT//
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(87) International Publication No : NA

(61) Patent of Addition to Application Number :NA
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(62) Divisional to Application Number :NA
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(57) Abstract :
Design of Chitosan Nanoparticle Coated Mini-Implants for Dental Issues and analysis of their properties is the proposed invention. The invention focuses on predicting the pros and cons associated with treating dental issues with chitosan nanoparticles coated with mini-implants. The properties of chitosan nanoparticles are also analysed.

No. of Pages : 13 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :11/07/2022

(21) Application No.202241039620 A
(43) Publication Date : 22/07/2022

(54) Title of the invention : DESIGNING A NANOSTRUCTURED PHOTOVOLTAICS ON SOLAR PANELS TO INCREASE THE EFFICIENCY OF SOLAR ENERGY UTILIZATION

(51) International classification	:H01L0031021600, H01L0031054000, H02J0007350000, E21B0043160000, G06F0030000000
(86) International Application No Filing Date	:PCT// :01/01/1900
(87) International Publication No	: NA
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(57) Abstract :
Designing a nanostructured photovoltaics on solar panels to increase the efficiency of solar energy utilization is the proposed invention. The invention focuses on designing a new Nano structured solar panel. The proposed invention focuses on designing a framework where the efficiency of solar energy is increased by increasing the absorption capacity of solar panels.

No. of Pages : 13 No. of Claims : 5

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Government of India

(http://ipindia.nic.in/index.htm)

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Application Details	
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APPLICATION TYPE	ORDINARY APPLICATION
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FIELD OF INVENTION	COMPUTER SCIENCE
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Agent Number:

Sr. No.	CBR No.	Reference Number /Application Type	Application Number	Title/Remarks	Amount Paid
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2		E-2/4850/2022-CHE	202241065623	Form2	0
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Payment Mode	Bank Name	Cheque/Draft Number	Cheque/Draft Date	Amount in Rs
Draft	South Indian Bank Ltd	545409	19/10/2022	1750

Note: This is electronically generated receipt hence no signature required.

FORM 1 THE PATENTS ACT 1970 (39 of 1970) and THE PATENTS RULES, 2003 **APPLICATION FOR GRANT OF PATENT** (See section 7, 54 and 135 and sub-rule (1) of rule 20)			(FOR OFFICE USE ONLY)		
		Application No.			
		Filing date:			
		Amount of Fee paid:			
		CBR No:			
		Signature:			
1. APPLICANT' S REFERENCE / IDENTIFICATION NO. (AS ALLOTTED BY OFFICE)					
2. TYPE OF APPLICATION [Please tick (✓) at the appropriate category]					
Ordinary (✓)		Convention ( )		PCT-NP ( )	
Divisional ( )	Patent of Addition ( )	Divisional ( )	Patent of Addition ( )	Divisional ( )	Patent of Addition ( )
3A. APPLICANT (S)					
Name in Full		Nationality	Country of Residence	Address of the Applicant	
G.AMALA JOTHI GRACE		Indian	India	House No.	Department of Chemistry
				Street	St.Mary's College
				City	Thoothukudi
				State	Tamil Nadu
				Country	India
				Pin code	628001
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				Street	Bannari Amman Institute of Technology
				City	Sathyamangalam
				State	Tamil Nadu
				Country	India
				Pin code	638401
A. AROCKIA JENECIUS		Indian	India	House No.	Department of Botany

ALPHONSE				
			Street	St.Mary's College
			City	Thoothukudi
			State	Tamil Nadu
			Country	India
			Pin code	628001
P.SUBAVATHY	Indian	India	House No.	Department of Zoology
			Street	St.Mary's College
			City	Thoothukudi
			State	Tamil Nadu
			Country	India
			Pin code	628001

3B. CATEGORY OF APPLICANT [Please tick (✓) at the appropriate category]

Natural Person (✓)	Other than Natural Person		
	Small Entity ( )	Startup( )	Others ( )

4. INVENTOR(S) [Please tick (✓) at the appropriate category]

Are all the inventor(s) same as the applicant(s) named above	Yes (✓)	No ( )

If "No", furnish the details of the inventor(s)

Name in Full	Nationality	Country of Residence	Address of the Inventor	
			House No.	
			Street	
			City	
			State	
			Country	
			Pin code	

5. TITLE OF THE INVENTION

TELLURIUM NANOPARTICLES USING CONUS BETULINUS AND IT'S APPLICATIONS

6. ~~AUTHORISED REGISTERED PATENT AGENT (S)~~	~~IN/PA No.~~	
	~~Name~~	
	~~Mobile No.~~	
7. ADDRESS FOR SERVICE OF APPLICANT IN INDIA	Name	G.AMALA JOTHI GRACE
	Postal Address	Department of Chemistry St.Mary's College (Autonomous), Thoothukudi - 628001, Tamil Nadu, India
	Telephone No.	04612320946
	Mobile No.	+91-7010271539; +91-9944162838
	Fax No.	04612320947
	E-mail ID	arsahana2010@gmail.com

8. IN CASE OF APPLICATION CLAIMING PRIORITY OF APPLICATION FILED IN CONVENTION COUNTRY, PARTICULARS OF CONVENTION APPLICATION

Country	Application Number	Filing date	Name of the applicant	Title of the invention	IPC (as classified in the convention country)

9. IN CASE OF PCT NATIONAL PHASE APPLICATION, PARTICULARS OF INTERNATIONAL APPLICATION FILED UNDER PATENT CO-OPERATION TREATY (PCT)

International application number	International filing date

10. IN CASE OF DIVISIONAL APPLICATION FILED UNDER SECTION 16, PARTICULARS OF ORIGINAL (FIRST) APPLICATION

Original (first) application No.	Date of filing of original (first) application

11. IN CASE OF PATENT OF ADDITION FILED UNDER SECTION 54, PARTICULARS OF MAIN APPLICATION OR PATENT

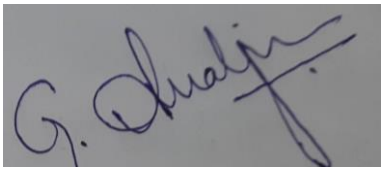
Main application/patent No.	Date of filing of main application

12. DECLARATIONS

(i) Declaration by the inventor(s)

We, the above named inventor(s) are the true & first inventor(s) for this Invention and declare that the applicant(s) herein is/are my/our assignee or legal representative.

Date : 11.11.2022

Signature(s) : 

Name(s) G. AMALA JOTHI GRACE

Date : 11.11.2022

Signature(s) : 

Name(s) V. SATHISH

Date : 11.11.2022

Signature(s) : Arockia Jenecius Alphonse

Name(s) A. AROCKIA JENECIUS ALPHONSE

Date : 11.11.2022

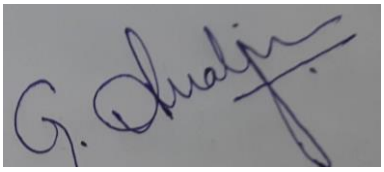
Signature(s) :

Name(s) P.SUBAVATHY

(ii) Declaration by the applicant(s) in the convention country

I/We, the applicant(s) in the convention country declare that the applicant(s) herein is/are my/our assignee or legal representative.

Date : 11.11.2022

Signature(s) : 

Name(s) G. AMALA JOTHI GRACE

Date : 11.11.2022

Signature(s) :

Name(s) V. SATHISH

Date : 11.11.2022

Signature(s) :

Name(s) A. AROCKIA JENECIUS ALPHONSE

Date : 11.11.2022

Signature(s) :

Name(s) P.SUBAVATHY

(iii) **Declaration by the applicant(s)**

We the applicant(s) hereby declare(s) that: -

- We are in possession of the above-mentioned invention.
- The provisional/complete specification relating to the invention is filed with this application.
- The invention as disclosed in the specification uses the biological material from India and the necessary permission from the competent authority shall be submitted by me/us before the grant of patent to me/us.
- There is no lawful ground of objection(s) to the grant of the Patent to me/us.
- I am/we are the true & first inventor(s).
- I am/we are the assignee or legal representative of true & first inventor(s).
- The application or each of the applications, particulars of which are given in Paragraph-8, was the first application in convention country/countries in respect of my/our invention(s).
- I/We claim the priority from the above mentioned application(s) filed in convention country/countries and state that no application for protection in respect of the invention had been made in a convention country before that date by me/us or by any person from which I/We derive the title.
- My/our application in India is based on international application under Patent Cooperation Treaty (PCT) as mentioned in Paragraph-9.
- The application is divided out of my /our application particulars of which is given in Paragraph-10 and pray that this application may be treated as deemed to have been filed on DD/MM/YYYY under section 16 of the Act.
- The said invention is an improvement in or modification of the invention particulars of which are given in Paragraph-11.

13. FOLLOWING ARE THE ATTACHMENTS WITH THE APPLICATION

(a) Form 2

Item	Details	Fee	Remarks
Complete/ ~~provisional~~ specification)#	No. of pages: 12	Rs.1750/-	
No. of Claim(s)	No. of claims : 3 No. of pages : 1		
Abstract	No. of pages : 1		
No. of Drawing(s)	No. of drawings : 10 No. of pages : 4		

In case of a complete specification, if the applicant desires to adopt the drawings filed with his provisional specification as the drawings or part of the drawings for the complete specification under rule 13(4), the number of such pages filed with the provisional specification are required to be mentioned here.

(b) Complete specification (2 copies).

~~(c) Sequence listing in electronic form~~

(d) Drawings (in conformation with the international application)/as amended before the International Preliminary Examination Authority (IPEA), as applicable (2 copies).

~~(e) Priority document(s) or a request to retrieve the priority document(s) from DAS (Digital Access Service) if the applicant had already requested the office of first filing to make the priority document(s) available to DAS.~~

~~(f) Translation of priority document/Specification/International Search Report/International Preliminary Report on Patentability.~~

(g) Statement and Undertaking on Form 3 (2Copies)

(h) Declaration of Inventorship on Form 5

(i) ~~Power of Authority~~

(j) Request for Publication on Form 9 (2 Copies)

(k)Request for Examination on Form 18 (2 Copies)

Total fee **Rs. 1,750/-** in Bank Draft bearing No 545409 Date on 19.10.2022 in South Indian Bank, Tuticorin branch.

We hereby declare that to the best of my/our knowledge, information and belief the fact and matters slated herein are correct and I/We request that a patent may be granted to me/us for the said invention.

Dated this 11th November 2022

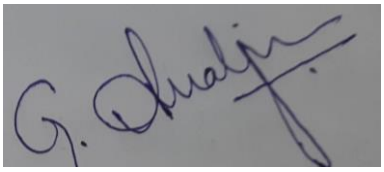
Arockia Jenecius Alphonse

A. AROCKIA JENECIUS ALPHONSE

(Applicant)

V. SATHISH

(Applicant)



G. AMALA JOTHI GRACE
(Applicant)

P.SUBAVATHY
(Applicant)

To,
The Controller of Patents
The Patent Office, at Chennai.

Note: -

* Repeat boxes in case of more than one entry.
* To be signed by the applicant(s) or by authorized registered patent agent otherwise where mentioned.
* Tick (✓)/cross (x) whichever is applicable/not applicable in declaration in paragraph-12.
* Name of the inventor and applicant should be given in full, family name in the beginning.
* Strike out the portion which is/are not applicable.
* For fee: See First Schedule";

FORM 2

THE PATENT ACT, 1970

(39 of 1970)

&

The Patents Rules, 2003

COMPLETE SPECIFICATION

(See Section 10; rule 13)

1. **TITLE OF THE INVENTION** : TELLURIUM NANOPARTICLES USING CONUS BETULINUS AND IT'S APPLICATIONS

2. **APPLICANT (S)**
   a. NAME:

1 G. AMALA JOTHI GRACE.
2. V. SATHISH
3. A. AROCKIA JENECIUS ALPHONSE
4. P.SUBAVATHY

   b. NATIONALITY : Indian
   c. ADDRESS :

3. **PREAMBLE TO THE DESCRIPTION**

PROVISIONAL	**COMPLETE**
The following specification describes the invention.	The following specification particularly describes the invention and the manner in which is to be performed.

4. **DESCRIPTION** (Description shall start from next page.)

ANNUXURE I

5. **CLAIMS** (not applicable for provisional specification. Claims should start with the preamble – **"We claim"** on separate page)

ANNUXURE II

6. **DATE AND SIGNATURE** (To be given at the end of last page of specification)

7. ABSTRACT OF THE INVENTION (to be given along with complete specification on separate page)

ANNUXURE III

ANNUXURE I

4. DESCRIPTION

Field of invention

The present invention involved an user friendly synthesis of Tellurium Nanoparticles using Conus betulinus and it's applications

Objective of the invention

This objective of the invention contains

(i) Preparation of Tellurium nanoparticles

(ii) It has been prepared by species of sea snail Conus betulinus

(iii) Applications towards Antibacterial, antioxidant and anti-fungal has been studied

Background of the invention

Nanoparticles with its small size have significant effect in various applications. Tellurium Nanoparticle contributes wide range of medicinal applications. Nanoparticles play an important role in medicine especially in antibacterial and anti cancer activity [1-4]. Green method of synthesis is widely accepted to reduce the cost of producing nanomaterials and to reduce the hazardous effects [5]. Alloying of tellurium improves its properties towards the applications of optical and electronic devices, solar cells and rechargeable batteries [6]. Tellurium Nanoparticles is also widely used in medicinal field [7-9].

Eco-friendly method of synthesis [10] is currently used in the research than the physico-chemical methods due to its cost effective and reduced toxic evolution. For the current investigation, *Conus betulinus* a species of sea snail is used to synthesize Tellurium nanoparticles. The element Tellurium was chosen for this study since the elements in sixth group was reported less. Due to its excellent properties, various researchers have taken Te into account [11-18].

Materials and Methods:

An User friendly *approach to synthesize Tellurium Nanoparticles*

Synthesis of Tellurium nanoparticles is carried out using 0.01M Tellurium chloride in double-distilled water using *Conus betulinus*. Tellurium chloride and *Conus betulinus* were mixed together in a ratio of (9:1, 8:2, 7:3, 6:4, and 5:5). In this different ratio concentration, 5:5 ratio concentration was selected for the bulk preparation because it shows a higher production than other ratios stirred at 800 rpm using a magnetic stirrer. After 1 hour the solution turns into a milky-white colour The process was carried out under dark condition.. The mixture was centrifuged for 15 minutes at 15,000 rpm. Inorder to remove impurities Tellurium pellet was washed with deionized water. The nanoparticles formed were stored in a cool, dry and dark place. The synthesized particles were characterized using UV- Visible spectrometer (Shimadzu UV-2700), FTIR spectroscopy (Bio-read FTIR 8400S models, USA), Atomic Force Microscopy analysis Nanosurf easy2 scan BT02218 profilometer, Scanning electron Microscopy Hitachi S-4500 and X-ray diffraction Philips-X'PertPro.

Anti Bacterial Activity

The anti-bacterial activity of prepared samples were determined using agar-well diffusion method. Petri plates containing 20 ml nutrient agar medium were seeded with 24hr culture of *P. acnes and S. oralis.* Te nanoparticles of 500 μg/mL, 250 μg/mL,100 μg/mL and 50 μg/mL were added into the wells.Then incubation was carried out for 24 hours at 37°C. The diameter of the inhibition zone was measured around the wells. Gentamicin antibiotic was used as a positive control. The antibacterial activity of the synthesized nanoparticles were determined and the values were calculated using Graph Pad Prism 6.0 software (USA) [19,20].

Anti Fungal Activity

The anti-fungal activity of the prepared nanoparticles were tested using potato dextrose agar medium. Petri plates containing 20ml potato dextrose agar medium was seeded with 72 hr culture of *Cryptococcus neoformans and Aspergillus fumigatus.* Tellurium nanoparticles of concentration 500 μg/mL, 250 μg/mL, 100 μg/mL and 50 μg/mL was added to the wells. For 72 hours, the plates containing various concentration of nanoparticles were then incubated at 28°C. Then note down the diameter of the inhibition zone. The positive control used for this anti fungal activity was Amphotericin B [19,20]. The Graph Pad Prism 6.0 software (USA) is used to find the values of inhibition.

DPPH Assay

0.1mM of DPPH solution (2,2-diphenyl-1-picryl-hydrazyl-hydrate) in methanol (100 μl) was added to various concentration of 300 μl Te nanoparticles. Te nanoparticles were prepared at various

concentration such as concentration 500 µg/mL, 250 µg/mL, 100 µg/mL, 50 µg/mL and 10 µg/mL. Then the solutions are shaken vigorously. It is then kept at room temperature for 30 minutes. Then the absorbance is measured at 517 nm using a UV-VIS spectrophotometer. Ascorbic acid was used as the reference [21].

HYDROGEN PEROXIDE SCAVENGING ASSAY

0.6 mL of 43 mM hydrogen peroxide is mixed with the synthesized Tellurium nanoparticles containing different concentration such as 500 µg/mL, 250 µg/mL, 100 µg/mL, 50 µg/mL and 10 µg/mL . After 10 minutes, the absorbance of hydrogen peroxide at 230 nm was determined. Phosphate buffer without hydrogen peroxide was used as blank solution and ascorbic acid was used as standard. The free radical scavenging activity was determined [22].

Results & Discussion

The optical absorbance properties of the synthesized Tellurium Nanoparticles were investigated using extract of *Conus betulinus* in the wavelength range 200-1100 nm at ambient temperature. Figure 1 indicates the UV –Visible diffuse reflectance spectra of Tellurium Nanoparticles using extract of *Conus betulinus* . There is a strong absorption peak around 300nm which confirms the presence of Te nanoparticles.

FTIR analysis of Tellurium nanoparticles shows a strong absorption peak around 3324cm^{-1} which shows the presence of N-H stretching frequencies, 1638 cm^{-1} due to CO stretching frequency and peak around 700cm^{-1} to 1100 cm^{1}due to C-O stretching frequency in Figure 2. IR Spectra shows the presence of biogenic reducing agents.

An Atomic Force Microscopy topographical image of Te nanoparticles is shown in Figure 3 which shows the agglomerated rock like structure. The average length of the rock structure is in 21.7 nm. It may be due to the Metal bindings.

SEM characterization of Tellurium nanoparticles showed a homogeneous image around 200nm in Figure 4.

XRD was carried out to determine the purity and the particle size of the synthesized nanoparticles. From the Figure 5, the particle was calculated. The size of the particle was found to be 54.28nm.

The size of nanoparticle was determined using Scherrer formula

$$D= 0.9\lambda/\Delta \cos\theta$$

The antibacterial activity of the Tellurium nanoparticles against *Streptococcus oralis* and *Propionibacterium acnes* determined using agarwell diffusion method shows a good inhibiting effect at higher concentration in Figures.. From the graph, it was clear that the inhibiting level increases as the concentration increases. Inhibitory concentration at 50 percentage was found to be 55.22 μg/ml. Dose dependent increase in the antibacterial activity was observed. At higher concentration (500 μg/ml), 92% excellent inhibition activity was observed.Antifungal activity of Tellurium Nanoparticles were determined against *Cryptococcus neoformans and Aspergillus fumigates*. The inhibitory effect of Tellurium nano particles was studied against *Cryptococcus neoformans* and *Aspergillus fumigates at various concentrations using Potato dextrose agar medium proved a good inhibition activity. The results showed that at* 500 μg/ml, a high inhibitory activity was observed. Pathogens growth can be inhibited. Hence it can be used as excellent antifungal agent [19].

The percentage inhibition of synthesized nanoparticles was calculated for DPPH radical scavenging activity of Tellurium nanoparticle using standard ascorbic acid solution. Figure 7 demonstrates the photograoh of DPPH Radical Scavenging activity for Tellurium nanoparticles. At 517nm, a good inhibition effect was observed around 67.32% for 500 μg/ml. The plot of concentration versus percentage of inhibition in Figure8 exhibits a good percentage of inhibition in triplicates. This shows that the free radicals exist in our body will get scavenge using this Te nanoparticles. Hence it finds its application in anti-aging property. At higher concentration, excellent inhibition property is observed. The inhibitory concentration at 50% is found to be 97.55 μg/ml

Inhibitory concentration for Hydrogen peroxide scavenging activity at 230nm at 50 percentage was found to be 55.22 μg/ml. Photographs of Hydrogen Peroxide activity was illustrated in Figure 9. Dose dependent increase was observed in Figure 10. At higher concentration (500 μg/ml), 92% excellent inhibition activity was observed.

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Brief Description of the Drawing

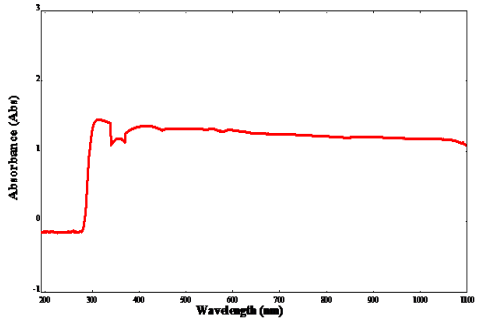

Figure 1. UV-VISBLE Spectra of Tellurium nanoparticles using *Conus betulinus*

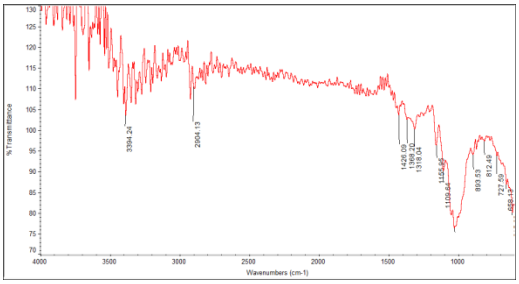

Figure 2. Infrared Spectra of Tellurium nanoparticles using *Conus betulinus*

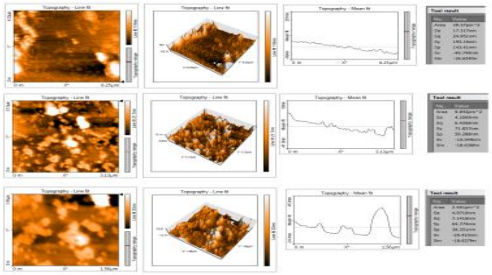

Figure 3. AFM images of Te nanoparticles using *Conus betulinus*

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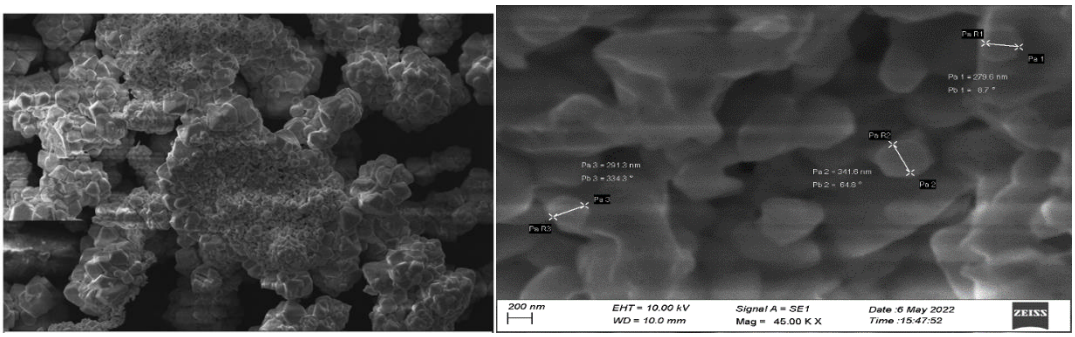


Figure 4. SEM images of Te nanoparticles using *Conus betulinus*

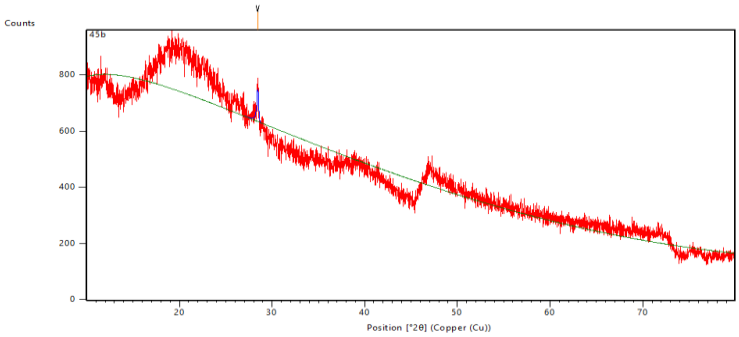


Figure 5. XRD of Te nanoparticles using *Conus betulinus*

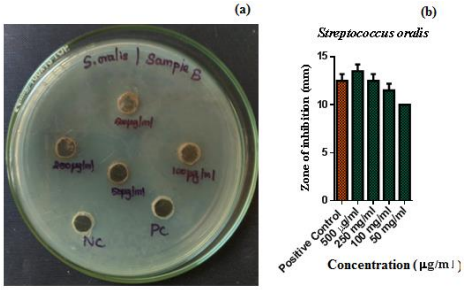


Figure 6. a.Photographs of Zone Inhibition b. Concentration Versus Zone of inhibition for the antibacterial Activity of Te nanoparticles against *Streptococcus oralis*

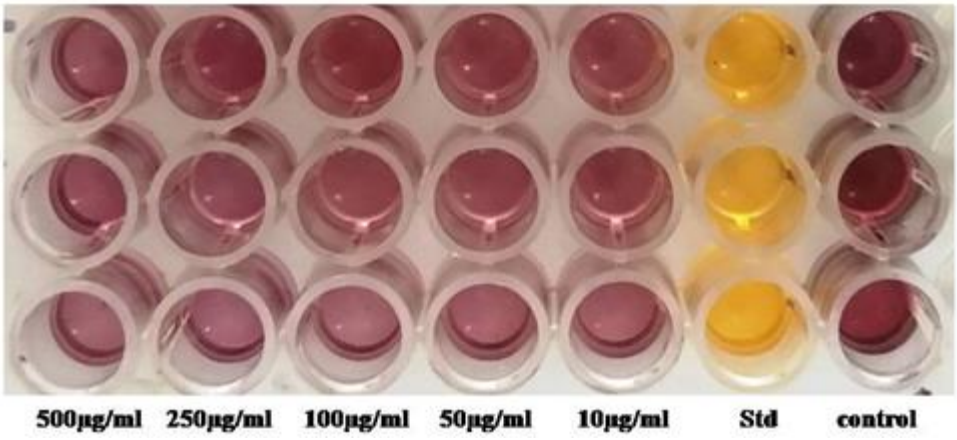


Figure 7. Photographs of DPPH radical scavenging activity of Tellurium nanoparticles.

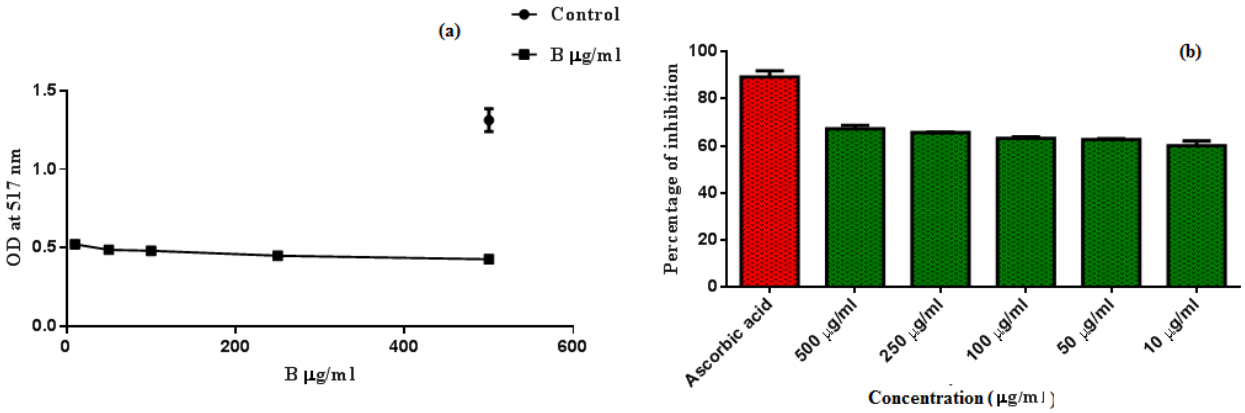


Figure 8. Effect of Te Nanoparticles for DPPH Radical Scavenging activity.

a. Concentration Vs OD at 517nm. B. Concentration Versus Percentage of Inhibition

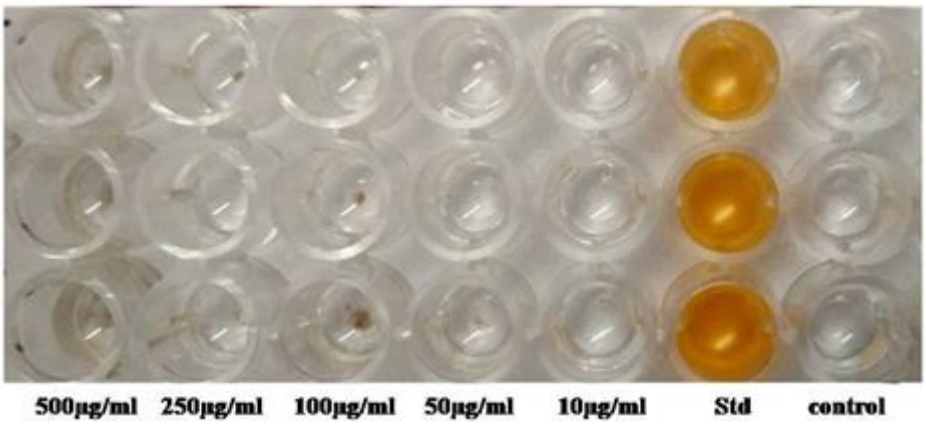


Figure 9. Photographs of Hydrogen Peroxide scavenging activity of Tellurium nanoparticles.

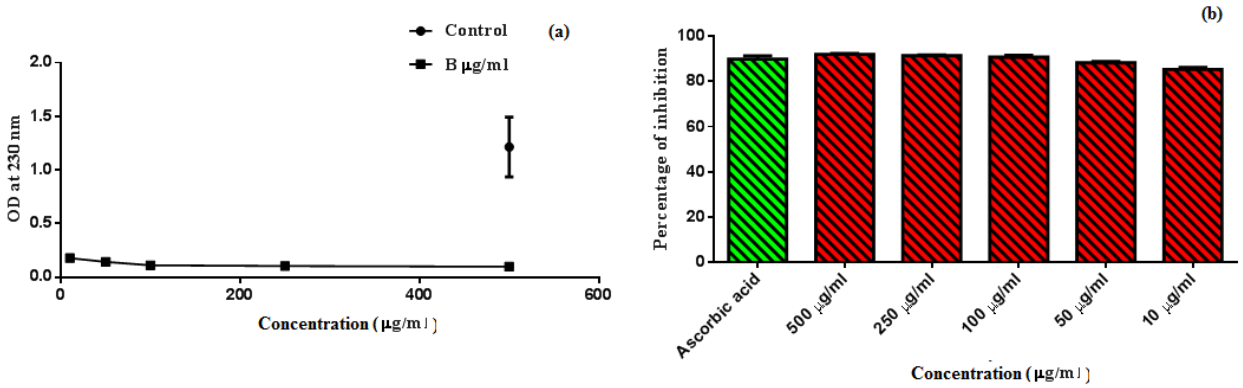


Figure 10. Effect of Te Nanoparticles for Hydrogen Peroxide Scavenging activity.
a. Concentration Vs OD at 230nm. B. Concentration Versus Percentage of Inhibition

Detailed Description of the Invention

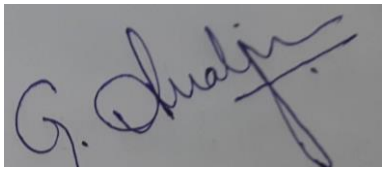
Various methods such as physical, chemical and biological methods are available to synthesis Nanoparticles. Green synthesis of Nanoparticles is an important method to synthesis, Since it is highly efficient for the fabrication of Nanoparticles at Nanoscale without affecting our Environment. By Eco-Friendly Method, using *Conus betulinus* Te nanoparticles can be synthesized. This method of biogenically synthesized Te nanoparticles is characterized using UV-visible Spectra, IR Spectra. Also, the surface morphology of the nanoparticles is confirmed by SEM and AFM techniques. The extract of *Conus betulinus* is successfully employed for the preparation of Te nanoparticles. The nanoparticles synthesized shows good absorbance around 300 nm. The presence of Bio-active agents in the extract was confirmed from FTIR studies. The results of Atomic Absorption spectra showed the formation of nanoparticles. Also, SEM images confirms the Flaky nanoparticles. Anti-Bacterial and Anti-Fungal applications showed on excellent percentage of inhibition at higher concentration. Hence this Te nanoparticles is used for Anti-Bacterial and Anti-Fungal application. The scavenging effect of DPPH and Hydrogen Peroxide showed that the synthesized nanoparticles can be employed for Anti-Aging application.

ANNUXURE II

5. We Claims

1. Tellurium nanoparticle prepared from the sea snail CONUS BETULINUS
2. It exhibits Anti-Bacterial and Anti-Fungal properties.
3. The scavenging effect of DPPH and Hydrogen Peroxide showed that the synthesized nanoparticles can be employed for Anti-Aging application.

Dated this 11.11.2022

Signature: 

G. AMALA JOTHI GRACE

Signature: 

V. SATHISH

Signature: Arockia Jenecius Alphonse.

A. AROCKIA JENECIUS ALPHONSE

Signature: P. Subatth

P.SUBAVATHY

ANNUXURE III

7. ABSTRACT OF THE INVENTION

Tellurium Nanoparticles using *Conus betulinus* was synthesized by Eco-friendly method. UV- Visible spectroscopy analysis confirmed the formation of Nanoparticles. Fourier Transform Infrared Spectroscopy indicates the presence of reducing agents. Atomic Force Microscopy analysis showed the nanoparticles formed are of agglomerated rocky shape. The Scanning electron microscopy images also confirmed the presence of the flaky nanostructures. The inhibitory activity of nanoparticles were studied and an excellent inhibition activity was observed against the bacteria and fungus confirms the antibiotic property. DPPH scavenging and Hydrogen peroxide scavenging results shows excellent property towards anti-aging applications.

FORM 3

THE PATENTS ACT, 1970

(39 of 1970)

and

THE PATENTS RULES, 2003

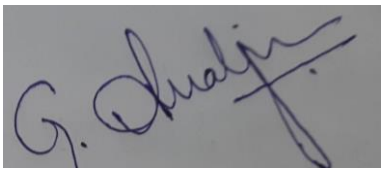
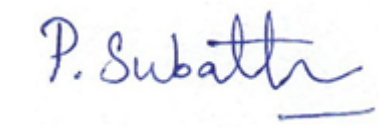
STATEMENT AND UNDERTAKING UNDER SECTION 8

(See section 8; Rule 12)

1. Name of the applicant(s).	**We G. AMALA JOTHI GRACE,** **A. AROCKIA JENECIUS ALPHONSE,** **V. SATHISH,** **P.SUBAVATHY,** hereby declare:
2. Name, address and nationality of the joint applicant.	(i) that We have not made any application for the same/substantially the same invention outside India ~~Or~~ ~~(ii) that I/We who have made this application No……dated~~ ……..alone/jointly ~~with ……., made for the same/ substantially same invention, application(s) for patent in the other countries, the particulars of which are given below:~~

Name of the country	Date of application	Application No.	Status of the application	Date of publication	Date of grant
NONE					

3. Name and address of the assignee	(iii) that the rights in the application(s) has/have been assigned to NONE

	(iv)that We undertake that upto the date of grant of the patent by the Controller, We would keep him informed in writing the details regarding corresponding applications for patents filed outside India within six months from the date of filing of such application. Dated this 11 November 2022
4. To be signed by the applicant or his authorized registered patent agent.	Signature. ……  G. AMALA JOTHI GRACE (Applicant)  V. SATHISH  A. AROCKIA JENECIUS ALPHONSE (Applicant)  P.SUBAVATHY

	(Applicant)
5. Name of the natural person who has signed.	(……..……).
	To The Controller of Patents, The Patent Office, At Channai
Note.- Strike out whichever is not applicable;	

FORM 5
THE PATENT ACT, 1970
(39 OF 1970)
&
The Patent Rules, 2003
DECLARATION AS TO INVENTORSHIP
[See section 10(6) and rule 13(6)]

1.NAME OF APPLICANT (S)	**1. G. AMALA JOTHI GRACE** **2. V. SATHISH** **3. A. AROCKIA JENECIUS ALPHONSE** **4. P.SUBAVATHY**

Hereby declare that true and first inventor(s) of the invention disclosed in the complete specification filed in pursuance of my / our application numbered…… filed on 11 November 2022 are

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Dated this 11 November 2022

Arockia Jenecius Alphonse

A. AROCKIA JENECIUS ALPHONSE

(Applicant)

V. SATHISH

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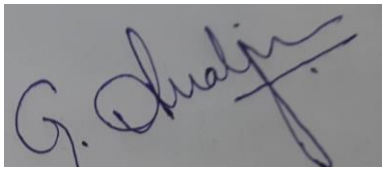

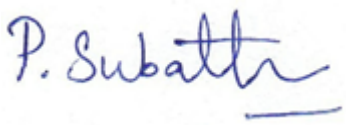

G. AMALA JOTHI GRACE
(Applicant)

P.SUBAVATHY
(Applicant)

Signature:-

3. Declaration to be given when the application in India filed by the applicant in the convention country:
We, the applicant(s) in the convention country hereby declare that our right to apply for a patent in India is by way of assignment from and first inventor(s).
Dated this 11 November 2022

Signature:-

4. Statement :
I/We assent to the invention referred to in the above declaration, being included in the complete specification filled in pursuance of the stated application.
Dated this 11 November 2022

Signature of the additional inventor(S):-

To,
The Controller of Patents,
The Patent Office,
at Chennai

Note: -

* Repeat boxes in case of more than one entry.
* To be signed by the applicant(s) or by authorized registered patent agent otherwise where mentioned.
* Tick (□)/cross (x) whichever is applicable/not applicable in declaration in paragraph-12.
* Name of the inventor and applicant should be given in full, family name in the beginning.
* Strike out the portion which is/are not applicable.

For fee: See First Schedule

पेटेंट कार्यालय
शासकीय जर्नल

OFFICIAL JOURNAL
OF
THE PATENT OFFICE

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PUBLICATION OF THE PATENT OFFICE

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(51) International classification	:B01J 230000, C04B 354750, C23C 161400, C23C 163200, H01L 514200
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(57) Abstract :
IMPLEMENTATION OF TECHNIQUES FOR ANALYSIS OF PHOTODETECTORS EMBEDDED WITH CHEMICAL VAPOR DEPOSITED LEAD-FREE BISMUTH MIXED HALIDE PEROVSKITE FILMS 5 Implementation of techniques for analysis of photodetectors embedded with chemical vapor deposited lead-free bismuth mixed halide perovskite films. The crystal film of the halide perovskite composition has at least one with an average grain size of at least thirty microns, a significant crystallographic orientation demonstrated in the order parameter. A single crystal substrate is covered with an epitaxial layer that contains a halide perovskite made from the at 10 least one precursor after at least one precursor has been evaporated. Also offered are semiconductor structures produced using the approach. Frit and cream mixtures are suitable for casting and bonding with different substrates - glass, metal, silicon at high temperature. This alloy is particularly useful for castings that require welding and cutting while being produced using a low pressure die, such as castings for faucet bodies in a water supply system. 15 A microcavity exists between the first semiconductor layer and the substrate between the microcavity and the subsequent first semiconductor layer.

No. of Pages : 18 No. of Claims : 1