Report

on

Biotech Innovation Ignition School (BIIS-2)

SRISTI- BIRAC Initiative

at

Ahmedabad

on

February 5-26, 2018

Biotech Inoovation Ignition School (BIIS)-2
Ahmedabad, February 5-26, 2018
Draft summary report

SRISTI (Society for Research and Initiatives for Sustainable Technologies and Institutions) in collaboration with BIRAC (Biotechnology Industry Research Assistance Council, Department of Biotechnology,Govt. of India) is organizing a three-week BIIS (Biotech Innovation Ignition School) for validating, value adding and product development around grassroots innovations. The BIIS will develop solutions for grassroots applications for human, animals, and agricultural applications including herbal technologies, medical devices and microbial application. The BIIS-2 will be held at Ahmedabad, February 5-26, 2018. It is likely that some other institutes like GSBTM, Gujarat University, PERD may also join the school. The selected students will be assigned individual projects in primarily four action-research areas drawing upon the Honey Bee Network Database:-

1. Pharmacognosy/Phytochemistry - SRISTI's Grassroots database contains many traditional knowledge practices as well contemporary innovations from across the country. These projects would involve validation/value addition to these practices. A few of these practices are presented here - http://www.sristi.org/cms/sristi-birac,http://www.sristi.org/hbnew/honeybee_database.php

2.Microbiology-SRISTI has a Microbial diversity bank containing 8000+ organisms (bacteria, fungi, and actinomycetes) isolated from the soil samples collected during Shodh Yatras in different parts of the country (http://www.sristi.org/cms/shodhyatra). An extensive study of screening these isolated microbes for novel human, animal, and agricultural application would be conducted.

3. Medical devices- Value addition/product development of any of the open source projects listed on our summer school website (http://summerschool.sristi.org/) regarding medical devices for human and animal health care or other medical devices for meeting unmet social needs.

4. Agriculture- Validation of grassroots practices by conducting field trials for the purpose of product development complemented by lab screening.

The abstracts along with the objective of the projects will be shared with the selected students one week before the start of the BIIS. The participants would be expected to develop a project proposal and a work plan. These students would receive an expert feedback on their proposals from the reviewers. These students will also receive hands-on training in various techniques of microbiology, phytochemical extraction procedures, and using various lab equipments (AAS, HPTLC, HPLC etc.) as per the need of the project in the first week of the event.

The students were selected from ten states across the country, with 52.5% of them being girl participants. The students from different regions of India worked together in one platform (BIIS) towards common goal of making India innovative, collaborative, and inclusive.

Attached below is the following list of programs that was part of BIIS-2

Inauguration Schedule

The inaugural session was held on February 5 at Gujarat University, Ahmedabad. Kindly find below the schedule for Inaugural day and a couple of following days.

BIIS (Biotech Innovation Ignition School) ***February 5-26,2018*** ***Venue****- Auditorium Hall,Department of Zoology,Gujarat University,Ahmedabad*	
February 5, 2018	
9:00-10:00	Overview about BIIS-1, goal and purpose for BIIS-2, Introduction about Honeybee Network and SRISTI by Dr. Chhavi Gupta & Dr. Debleena Bhattacharya
10:00-10:15	Introduction session by **Prof Anil K Gupta,** Founder-Honey Bee Network, Coordinator-SRISTI, GIAN, & EVC, NIF Visiting faculty-IIMA
10:15-10:25	**Dr.Rakesh Rawal,**H.O.D,Department of Biochemistry and Forensic Science,Gujarat University
10:25-10:30	**Dr. Manish Nivsarkar** ,Director, B.V Patel PERD
10:30-10:35	**Mr.Ramesh Patel**,Secretary,SRISTI
10:35-10:40	**Dr. Mamta Shah**, LM College of Pharmacy, Ahmedabad, India

10:40-10:45	**Dr.R.J Verma**,H.O.D,Department of Zoology,Gujarat University
10:45-10:50	**Prof.Sarat Kumar Dalai,** Director,Instiute of Science,Nirma University
10:50-11:10	Introduction of the **BIIS participants**
11:10-12:00	Overview about Honey Bee Network by **Prof.Anil Kumar Gupta**
12:00-12:05	Vote of thanks by Mr. Chetan Patel
12:10-1:00	Lunch

Work schedule and lectures

The students pursued their experiments work at SRISTI Sanshodhan Natural products lab and B. V. Patel Pharmaceutical Education and Research Development (PERD) Centre. The names and the title of projects of students are:

Sr. No.	**Name**	**Project Title**
1	Aavrati Saxena	Evaluation of Anti-Diarrhoeal activity of *Euphorbia hirta*
2	Aayushi D. Patel	Screening of phosphate solubilizing bacteria (PSB) from isolates of Maharashtra Shodh Yatra of Sristi
3	Abarna Balamurugan	Development of herbal aerosol formulation for Mastitis
4	Akashdeep Dey	Validation of herbal practice to cure infant dysentery
5	Akhil V. M.	Ergonomics and Design improvization for load-carrying device
6	Anita	Isolation of Chitin degrading microbes from waste of western coastal region of Gujarat
7	Antony Michael Kingston. A.	Isolation of Chitin degrading microbes from coastal sediment, water and crab's waste
8	Ayushi Joshi	Evaluation of water purification using *Syzygium cumini*
9	Chirag Vyas	Evaluation of raw milk for seed germination in Leguminaceae

10	Haritha Duraiswamy	Evaluation of anti-microbioal activity and phytochemistry of *Tridax procumbens* Linn. for Anti diarrhoea
11	Kavita Munjal	Development of standarized dietary supplement for the management of obesity and therapy
12	Laeba Haider	Evaluation of Anti-Diarrhoeal activity of *Euphorbia hirta*
13	Madathil Deepa Dileep Kumar	Development of chitin from shrimp shell - An eco-friendly approach using buttermilk
14	Mohan Kumar S.	1)Phytochemistry of medicinal plants of grassroots practices against Dysentry2)Pharmacology and Phytochemistry of *Randia dumentorum*
15	Mriganka Saha	Production and Evaluation of value-added chemicals from agricultural waste
16	Mudasir Ahmad Dar	Study on Phytochemistry of *Notholirion thomsonianumroot*
17	N. Krishnaveer	Evaluation of water purification using *Strychnos potatorum*
18	Neeta Jadhav	Prototyping of Animal Health Monitoring Device
19	Niharika Saini	Evaluation of Grassroots practice against skin infection
20	Nivetha A.	Study on bioactive compounds on therapeutic potential of *Bergenia Ciliataand Quercues incana* extracts for medicinal formulation
21	R. K. Nagarjun	Isolation and characterization of herbal extracts for the treatment of eczema
22	Rohit Satyam	Evaluation of anti-microbioal activity and phytochemistry of *Tridax procumbens* Linn. for Anti diarrhoea
23	Salil Kumar Arkvanshi	Evaluation of herbal formulation for Field Efficacy against whitefly
24	Saloni Rane	Prototyping of Animal Health Monitoring Device
25	Sarath R.	Evaluation of plants of grassroots practice against skin infection
26	Satyarthi Mishra	1. Ergonomics and Design improvization for load-carrying device 2. Evaluation of Water purification using fruit pulp of Sapindus trifoliatus
27	Sharmilaa D.	Anti-microbial, anti-oxidative and anti-inflammatory activities of *Heracleum candicans* against UTI
28	Shayma A. Shaikh	Study of anti-inflammatory and anti-microbial efficacy of *Arnebia benthamii* and *Saussurea costus* against eczema
29	Shriya Agarwal	Evaluation of *Solanum Xanthocarpum* extracts as a potential topical medication for Atopic Dermatitis

30	Shubhanshu Pandey	To evaluate potential cure for Eczema by using *Leptadenia retiulata* and *Cyamopsis tetragonoloba*
31	Suchita Lade	Evaluation of Grassroots practice for Crop protection
32	Sushri Subhasini Behera	Characterization of oil isolated from waste fish and its antimicrobial properties
33	Swapnil Kishor Nandre	Evaluation of Grassroots practice to control Aphid Cauliflower and Chilli
34	Tariq Ul Gani	Evaluation of Antimicrobial potential of roots of *Notholirion thomsonianum* against Diarrhea
35	Udit Yadav	Evaluation of Grassroots practice to control pest in crops
36	Vandana Anand	Evaluation of Grassroots practice to control pest in crops
37	Vinay Kumar	In-vivo & in-vitro evaluation of grassroot practice
38	Vrushali Bhashte	Prototyping of Animal Health Monitoring Device
39	Harad Vrushali vilas	Prototyping of Animal Health Monitoring Device
40	Saloni Sudhir Meher	Isolation of pigment producing microbes from soil samples of Goa Shodh Yatra
41	Prajakta Rajaram Walunj	Isolation of pigment producing microbes from soil samples of Goa Shodh Yatra

Additionally, following experts were invited from all over the country to deliver lectures during BIIS-2 from February 5-26, 2018.

Name and Designation	**Date**
Dr. Anil Koul, Director, Institute of Microbial Technology (IMTECH), Chandigarh	07/02/2018
Dr. Anirban Roy Choudhury, Principal Scientist, Institute of Microbial Technology (IMTECH), Chandigarh	07/02/2018
Dr. Manish Nivsarkar, Director, B.V Patel PERD, Ahmedabad	18/02/2018

Additionally, seven students working in field of Agricultural field trial visited Anand Agriculture University (AAU) on February 8, 2018 to learn from the agriculture facilities and get guidance from the nationally renowned experts.

Valedictory session and Award Ceremony

All the participating students presented their work in the front of evaluation committee on the final day of Biotech Innovation Ignition School (BIIS-2) from February 5-26, 2018.Further a presentation ceremony was conducted where a certification of participation was given by the chairperson of the valedictory session, Prof. Kiran Kalia, Director, NIPER, Ahmedabad. Also, the **15th best projects were awarded as Rs. 1 lac each appreciation research grant** to further continue their research work. The schedule for the final day was:-

BIIS-2 (Biotech Innovation Ignition School-2) ***February 5-26,2018*** ***Venue****- Blue room, KLMDC, Old Campus, IIM-Ahmedabad, Ahmedabad*

February 26, 2018	
9:15-9:30	Tea & Breakfast
9:30-9:40	**Prof. Anil K Gupta,** Founder-Honey Bee Network, Coordinator-SRISTI, GIAN & EVC, NIF, Visiting faculty-IIM-A & IIT-B
9:40-9:45	Introduction of the session Chairperson **Prof. Kiran Kalia**, Director, NIPER, Ahmedabad
9:45-9:50	**Dr. Shilpy Kochhar**, Manager, Entrepreneurship Development, BIRAC
9:50-9:55	**Dr. Manish Diwan,** Head, SPED, BIRAC
9:55-10:00	**Dr. Anshu Srivastava,** Scientist-B, B.V Patel PERD, Ahmedabad
10:00-10:05	**Mr.Rajnikant Patel,**Extension Officer in Aravali District & Innovator,NIF & SRISTI Awardee
10:05-10:05	**Dr. Rakesh Rawal**, H.O.D, Department of Biochemistry & Forensic Science, Gujarat University

10:05-11:35	**Presentation by BIIS Students**
11:35-11:45	**Tea break**
11:45-13:45	**Presentation by BIIS participants**
13:45-14:45	**Lunch**
14:45-15:35	**Interactive session with the jury**
15:35-16:05	Valedictory address by **Prof. Kiran Kalia,** Director, NIPER, Ahmedabad
16:05-16:15	Announcement of ten best projects
16:15-16:25	Certificate distribution to all the **BIIS participants**
16:25-16:35	Vote of thanks by **Mr. Ramesh Patel**, Secretary, SRISTI

Additionally **five Additional students will receive a research grant of Rs. 1 lakh each from National Innnovation Foundation (NIF),** on the basis of evaluation of synopsis where they will mention the future work that they will conduct in the same assigned project. Last date for sending the same is on or before 15th March, 2018.

The exhaustive work done for twenty-one days reflected on the outcome and key output is attached herewith where the ten best shortlisted projects of BIIS-2 are given:-

Sr. No.	Name	Project Title	Innovator's approach	Student's approach	Value addition	Future studies to be done	Technical Inputs from our side
1.	Aayushi D. Patel	Screening and Characterization of Phosphate-	Nil	• Grow bacteria specified media containing	Many heterotrophic bacteria and	Isolation of DNA and identification of	Selection of media and experiment

		Solublizing Bacteria from Shodh-Yatra (Maharashtra) Soil Sample		insoluble phosphate. • Incubate and observe the clearing zone around colonies. • Quantify the phosphorus dissolved by specified bacteria. • Select efficient culture based on above criteria.	fungi efficiently solubilize insoluble phosphate in the soil as well as the inert phosphorus sources. These organisms secrete organic acids that solubilize insoluble phosphorus which becomes then available for plant absorption.	phosphate solubliziers Indole Acetic Acid activity Bio-fertilizer Phosphatase activity Crop productivity Pot study	designing for identification and characterizatio n of phosphate solubilizing bacteria
2.	Abarna Balamurugan	Development of Herbal Aerosol Spray for Mastitis	Juice of leaves given to affected herds orally.	Validation of innovator's practice was tried with antimicrobial activity	Used different solvent extraction for analysis of phytochemical s, antimicrobial activity	Juice of *Salvadora persica* and *Morus alba* + IRON= AEROSOL SPRAY	Hot Extraction with different solvent as based on polarity. Determination of Antioxidant, Antiflavonoid

							& total phenolic content, scavenging activity of DPPH. Antibacterial Activity
3.	Akhil V. M.	Ergonomics and Design Improvisation for Load-Carrying Device	Nil	Develop device to reduce village women daily workload with the help of some external supporting device.	There is no issue in balancing No pain felt in the shoulder or back part Feeling more comfort	The current load-carrying device prototype has no issue with regards to balancing and user comfort. However, it can be further improved for effort reduction with the addition of linkages (exoskeleton system) to transmit the load to the ground.	He has himself designed and implemented its processing. We helped him with the idea.

						The design can be made customizable for user needs with the inclusion of the height adjustable system. The supporting device design needs to be compared with the actual load-carrying basket used by the Kashmiri women for improvements as required.	
4	Anita	Isolation of chitinase producing microbes from waste of western coastal region of gujarat	Problem found after survey of costal area of Gujarat	Isolation of chitinase producing bacteria from different samples of coastal areas of western Gujarat. Observation of bacterial growth	Isolation of chitinase producing bacteria from different samples of coastal areas of Gujarat.	• Identification of isolated microbes by 16s RNA sequencing • Biochemical tests conformation of chitinase	Chitinase producing bacteria isolation from different samples of coastal areas of Gujarat on different types

				by using different media; nutrient agar media with 1% colloidal chitin, nutrient agar media and crustacean waste powder media Maintain pure culture of isolated bacterial colonies Screening of bacterial colonies for enzyme extraction Enzyme assay form crude enzyme for chitinase activity.	Observation of microbial growth by using different media; Nutrient agar media with 1% colloidal chitin, Nutrient agar media and Crustacean waste powder media Screening of bacterial colonies for enzyme extraction Enzyme assay form crude enzyme for chitinase activity	producing bacterial • Characterization and purification of extracted crude enzyme use of chitinase (chitohexaos and chitoheptaose) in anti-tumour drug development • Develop a biopesticide for agricultural crops and fungal and insect infection in aquaculture from shrimp waste (pink gold). • Chitinase can be potent feed additive for shrimp culture for	of growth media. Preservation of bacteria and enzyme assay form crude enzyme for chitinase activity

						growth promotion. • Rapid degradation of crustacean waste by the application of chitinase enzyme	
5.	Laeba Haider	Evaluation of phytochemical constituents of *Euphorbia hirta* with respect to its anti-diarrheoal activity	*Euphorbia hirta* for the treatment of bloody diarrhoea in children	Scientifically validate the innovator's practice The phytochemical aspects of anti-diarrheal activity of *Euphorbia hirta*	Presence of beta-siosterol and lupeol could also be contributing to the anti-microbial activity of hot and cold extract from *Euphorbia hirta* HPTLC and TLC bio-autography of extracts for yhe characterizatio n of active	Finding a better mobile phase for the aqueous extract of Euphorbia hirta so that the innovator's practice can be validated. Finding out the combinations of bioactive compounds that are responsible for the anti-microbial activity of the plant. Once the combinations	Hot & cold Extraction with different solvent as based on polarity. Preliminary phytochemical screening, HPTLC and TLC bio-autography of extracts

					compound from extract	are known, the focus could be shifted to isolation of the bioactive compounds, either individually for further analysis or in combinations as predicted by the results of the present study.	
6.	Madathil Deepa Dileep Kumar	Development of chitin from shrimp shells an ecofriendly approach by using buttermilk fermentation	Problem found after survey of costal area of Gujarat	• Extraction of chitin from Shrimp shell waste through biological fermentation • Analysis and characterization of chitin • Isolation of protease producing bacteria from Shrimp shell waste	Extraction of chitin from Shrimp shell waste with butter milk fermentation Analysis and characterizatio n of chitin through FT-IR Isolation of protease producing bacteria from	Characterizatio n of chitin. Isolation of proteins and minerals can be done from the waste solution which is excarded after the preparation of chitin. Proteinconcentr ate can be prepared from	Extraction of chitin from Shrimp shell waste through butter milk fermentation Analysis and characterizatio n of chitin through FT-IR Isolation of protease producing bacteria from

					Shrimp shell waste	the shrimp shells.	Shrimp shell waste
7.	Mohan Kumar S	Phytochemistry of medicinal plants of grassroots practices against dysentery	Ajwain, pulp of Indian bael (is to be dried up & kept), Kurehi seeds (indrajapa). All the above ingredients are boiled with water. When the water become half and looks like little red tea. After boiling some white particles come out from the Kurehi seeds which are pressed with the tea to mix it well then the tea is given to child after cooling down thrice a day.	• Validation of the innovators practice, understanding of the chemical constituents of all the three plants as well as the mixture of the plants against infant dysentery. • Estimation of Thymol, Beta-sitosterol and Lupeol.	Preparation of extract using different solvents and their phytochemical screening using TLC and HPTLC.	Extraction of Beta-sitosterol and lupeol from all the three plants. To check antidiarrheal activity of all the plant extracts and mixture of plants against protozoans and viral particles this causes diarrhea. Isolation of Thymol from *T. ammi*	Preparation of extracts antimicrobial activity of the extracts against mastitis causing pathogens antibiofilm activity of the extracts Time-kill analysis of the extracts Phytochemical analysis
8.	Mriganka Saha	1. Plant Growth Promoter production from *Cestrum diurnum* by Fermentation	1 kg of Cestrum diurnum is soaked in 10 litres of water and is allowed to ferment for 10	1. Effect of *Cestrum diurnum in different fermentation medium* on plants	1. The Fermentation sample of Rajko in different	1. Long term effect of PGP on plants is to be observed. All the isolated microorganisms	Formulation development ,phytoconstituents study, FT-IR, LC-MS

		2. Production of Valuable Chemicals from agricultural waste	days. Then spray the fermentation product on plants.	for growth promotion 2. Production of lignin from crop waste.	mediums as well as plants extracts both worked as PGP and enhanced the adventious root formation and increased the number of leves significantly. This is because all the formulations contain Vitamin D3 as shown by LC-MS data. Vitamin D3 is proven to enhance the root formation. 2.Spraying of fermented *Cestrum diurnum* on plants for growth promotion and	are to be identified by 16sRNA. The biological compounds responsible for growth promotion in the formulations can be identified, separated and purified for product development. Identified microorganisms can be studied for their pathways 2. Quantitative studies to be done to know the exact yield of lignin & cellulose, hemicellulose. Purity of lignin & cellulose, hemicellulose is to be checked.	and isolation of microbes from formulation

					microbial effects	The extraction process is to be optimised. Production of commercially valuable chemicals is to be done	
9.	Nivetha A	Study on bioactive compounds and therapeutic potential of *Bergeniaciliata and Quercusincana*extracts for medicinal formulation	Anti-microbial, anti-oxidant and anti-inflammatory Of *Bergenia cilata* and *Quercus incana*	Extraction of bioactive compounds from *Bergenia cilata* and *Quercus incana* using different types of solvent extraction method for medicinal formulation.	Validation of innovators techniques using different solvent extracts.	Mimimum inhibitory concentration MIC To analyse the compound structure – NMR Anti-Cancer activity Anti-diabetic activity	Hot and cold extraction using different solvents for bioactive compounds and their antioxidants, anti-inflammatory, anti-microbial and TLC-HPTLC profiling.
10.	Rohit Satyam	Evaluation of antimicrobial activity and phyto-chemistry of *Tridax procumbens Linn*. for Anti-Diarrhoea	Use of Tridax paste with a spoon of sugar, twice a day	To validate innovator's practice and provide it scientific backbone.	Antimicrobial activity of Bisalyakarani (*Tridax procumbens*) different solvent	In-silico studies on Adenovirus, Norovirus can be performed to search therapeutic and prophylactic	Qualitative analysis of Phytochemicals. TLC Fingerprinting and

					extracts against E. Coli and antioxidant activity against Diarrhoea	candidates for Vaccine development against Viral Diarrhoea. This is advantageous since the preliminary studies for virus in wet lab would be sumptuous and would require higher BSL level and skills. The antimicrobial effects can be further studied in causative microorganisms with the high BSL facility, if desired. Clinical trials of controlled subjects are suggested and	Antimicrobial Activity of Phytoconstituents

						metabolic pathwaysa	
11.	Saloni Rane, Vrushali, Bhashte, Vrushali Harad & Neeta Jadhav	Prototyping of Animal Health Monitoring Device	Nil	Reducing the overhead of connecting the hardware to adapter and by using the concept of wireless power transmission instead of rechargeable batteries.	Waterproofing for safety. Wear ability for ease of use. More biometrics using simple sensors. Accurate illness diagnosis.Different animals and even human monitoring.	This device can be expanded for further safety and ease of use by adding waterproofing and wearability. Furthermore, other biometrics like respiration and more parameters can be added using simple sensors like the ones we have used. This expansion of measurement capability can help farmers identify with certainty many problems their livestock may have. Furthermore, we can add	Used ECG in replacement of Pulse sensor for more accuracy. Skin color affects Pulse Sensor output

						capabilities for measuring humans & other animals' biometrics as well.	
12.	Suchita Lade	Evaluation of Grassroots practice for Crop protection	Evaluation of the efficacy of botanical extracts (Neem fruits (Azadirachta indica), Aradusi leafs (Adhatoda Vasica), Jetropha leafs) against sucking pest (Whitefly & Aphids) on crops	Evaluate the efficacy of various botanical extract concentrations against sucking pest (Whitefly & Aphids) on Brinjal and Cauliflower and their phytochemical screening.	Validation of the efficacy of the innovator's formulation acts against the Whitefly and Aphids using different concentration of formulation and physico-chemical property	Further phytochemical analysis of formulations should be carried out to understand the different secondary metabolite compounds present in the formulation and identify the bioactive compounds responsible for the pesticidal activity. Study on isolation identification microbes	Phytochemical screening at different formulation concentration

						responsible for insecticidal activity.	
13.	Salil Kumar Arkvanshi	Evaluation of herbal formulation for Field Efficacy against whitefly	1. Crop protection against whitefly by *Lantana camara* extract 2. Crop protection aphids by Castor Husk	Used different concentration of herbal formulation for crop protection against whitefly and their screening of phytochemical constituents	Instead of using powder formulation for sucking pest control, the use of different concentration of extract is recommended by the present study	Efficacy of extract for controlling whitefly at different growth phase of crop plant viz. early, middle and late phase. In-vitro extraction and purification of the extract and identification of the chemical moiety responsible for targeted pest control From the above studies product development and its optimization will be easier.	Field study with different concentration of formulation and phytochemical analysis

14.	Shubhanshu Pandey	Validating potential cure for eczema using *L.reticulata* and *C.tetragonoloba* (Atopic Dermatitis)	1. Used plants (*Leptadenia reticulata* -Kadvi Dodi) secretion 2. Used crushed leaves of *Cyamopsistetragonoloba* (Guar) for potential cure for eczema	Hot extraction using different solvents like water and methanol. Phytochemical study and in-vitro antioxidant study. Antibacterial study and quantification by HPTLC	Validation of innovation practices was tried with different extraction for analysis of phytochemicals	About the protein filaggrin. Can any Phyto-constituent can play a major role inexpression of the gene coding this protein?	Hot extraction with different solvents as based on polarities. Determination of ant oxidation, anti-flavonoid & total phenolic content ,scavenging activity of DPPH & antimicrobial activity TLC and HPTLC analysis
15.	Vinay Kumar	In-vivo & in-vitro evaluation of grass root practice	Control the Termites in the Wheat Crop	In-vivo & In-vitro validate of the formulation acts against the Termites Isolation of the microbes from the Fermented formulation	Evaluate the Phyto & Physico chemical property of the both fermented formulation In-vivo & In-vitro validate of the formulation	Identification and validation of the microbes on the basis of biochemical and molecular characterization Standardization of mobile phase and extraction of the Key	The Phyto & Physico chemical property of the both fermented formulation. In-vivo & In-vitro validate of the formulation acts against the

					acts against the Termites Isolation of the microbes from the Fermented formulation Isolation of the microbes from the targeted area of the field	compound through TLC or HPTLC or LCMS Repeat the field experiments with the isolated microbes in permutation combination	Termites with different formulation concentration.

ANNOUNCEMENT

BIIS: Opportunity for Women biotechnology students to work on grassroots innovations and microbial diversity

Isolation, Characterization and Augmentation

SRISTI (Society for Research and Initiatives for Sustainable Technologies and Institutions) is organizing a four-week BIIS (Biotech Innovation Ignition School) for validating, value adding and product development around grassroots innovations. The BIIS will develop solutions for microbial application. The BIIS-3 will be held at Ahmedabad, April 30 to May 29, 2018. It is being launched on International Women's Day to unleash the talent of women students. It is likely that BIRAC (Biotechnology Industry Research Assistance Council, Department of Biotechnology, Govt.of India) might support this initiative. The selected students will be assigned individual projects in microbiology research areas drawing upon the Honey Bee Network Database and microbial diversity collection:-

SRISTI has a Microbial diversity bank containing 8000+ organisms (bacteria, fungi, and actinomycetes) isolated from the soil samples collected during Shodh Yatras in different parts of the country (http://www.sristi.org/cms/shodhyatra, http://www.sristi.org/cms/?q=en/sristi-

laboratory,http://www.sristi.org/cms/microbial-memories,http://www.sristi.org/cms/outcomes).An extensive study of screening, characterizing and augmenting these isolated microbes for novel human, animal, agricultural and industrial application would be conducted.

The abstracts along with the objective of the projects will be shared with the selected students one week before the start of the BIIS. The participants would be expected to develop a project proposal and a work plan. These students would receive an expert feedback on their proposals from the reviewers. These students will also receive hands-on training in various techniques of microbiology along with various lab equipments (AAS, HPTLC, HPLC, PCR, Gel Doc etc.) as per the need of the project in the first week of the event. The Faculty from the institutions of participants can also be associated with their projects as external supervisors.

It is hoped that each participant becomes a volunteer of the Honey Bee Network which has helped in scouting and disseminating rural creativity and innovation over the last three decades.

All the output will be credited to the knowledge providers and can be published thereafter with prior written concurrence and in some cases, as applicable, with the involvement of the BIIS team and knowledge providers.

Highest ethical code of Biotech research is expected to be followed. Team spirit and willingness to develop open source solutions will be highly encouraged. Peer learning will be strongly encouraged. The findings will be shared with knowledge providers and community conservators of soil ecosystem health and consequent microbial diversity in local language with the help of SRISTI and Honey Bee Network team.

Students are invited to participate in this SRISTI-BIRAC initiative by sending their resumes at BIIS@sristi.org. Students of microbiology/biotechnology, are specially invited to apply and preference will be given to women candidates. Those who are interested to work on SRISTI's microbial resources should write one page note on what kind of research they would like to do, why & how? All the students would get an invaluable opportunity to interact with both national and international experts as well as grassroots practitioners/innovators in their respective fields.

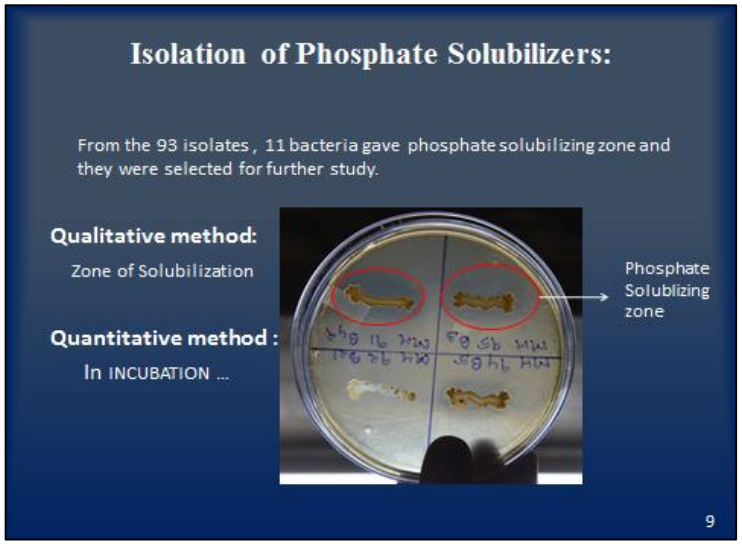
Last date for submission of application is April 5, 2018.

Kindly email at BIIS@sristi.org or call at 9227761140 for further queries.

Annexure I

The fifteen awarded projects of BIIS -2 (February 5th -26th, 2018)

1. **Project Title**:- Screening and Characterization of Phosphate-Solublizing Bacteria from Shodh-Yatra (Maharashtra) Soil Sample
   Participant's Name- Aayushi D. Patel



Results:

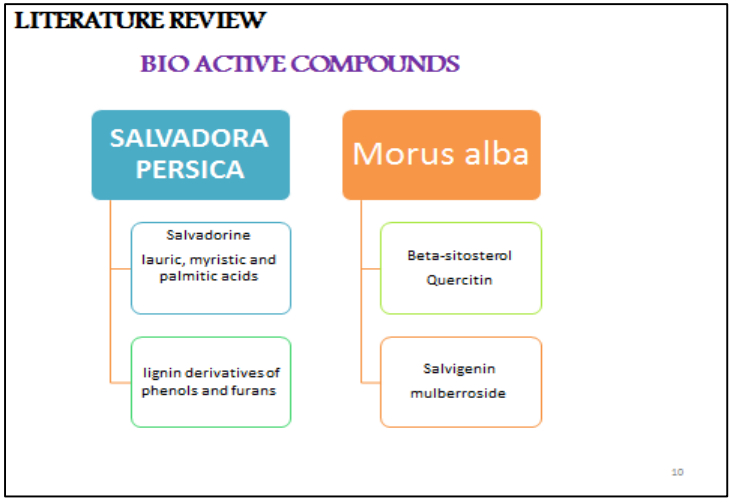
From the 93 isolates, 11 bacteria gave phosphate solubilizing zone

Future work to be done:

- Isolation of DNA and identification of phosphate solubliziers
- Indole Acetic Acid activity
- Bio-fertilizer

- Phosphatase activity
- Crop productivity
- Pot study

2. **Project Title:-** Development of Herbal Aerosol Spray for Mastitis
   Participant's name: - Abarna Balamurugan



DETAILS ABOUT EXTRACTION

SOLVENT	SOL QUANTITY (ml)	EXTRACTION TIME	HOT/COLD	PRE WT	POST WT	% EXTRACT VALUE
Mxd	100ml	2hrs	COLD	5g	1.6g	32%
S.per H2O	100ml	2hrs	HOT	5g	1.9g	38%
M.alba H20	100ml	2hrs	HOT	5g	1.5g	30%
S.Per Meth	100ml	3hrs	HOT	5g	1.7g(semi solid)	34%
M.alba Meth	100ml	3hrs	HOT	5g	1.3g(semi solid)	26%
Mxd	100ml	2hrs	HOT	5g	1.8g(semi solid)	36%

11

ANTI INFLAMMATORY RESULT

PLANT EXTRACT	5ul	10ul	25ul	50ul	100ul
mixed H2O	35.61 %	44.96%	72.08%	78.01%	**84.22%**
Hot S.persica methanol	10.38%	43.25%	69.77%	70.59%	77.08%
Mulberry hot methanol	21.51%	74.72%	53.81%	60.38%	70.01%
Hot mixed H2O	71.73%	75.87%	80.94%	84.22%	**90.93%**

Anti bacterial Activity Result

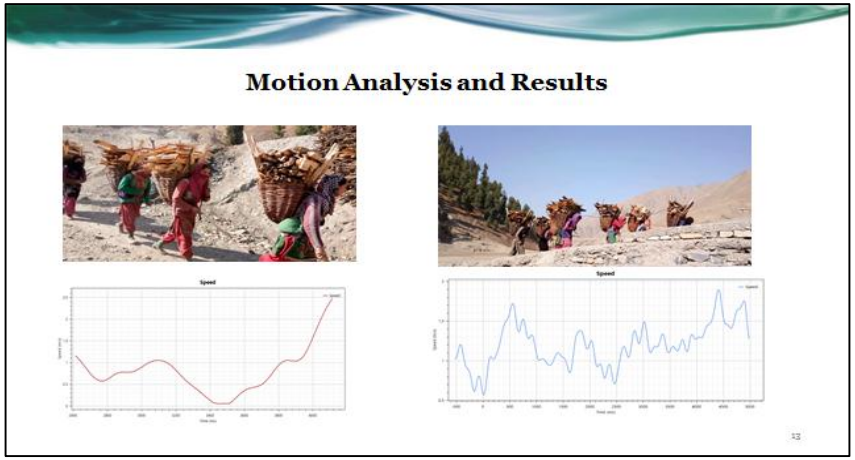
	Escherichia coli				Staphylococcus aureus			
EXTRACT	1	2	3	4	1	2	3	4
COLD MIXED H2O	-	1.6mm	2mm	2.2mm	-	1.2mm	1.3mm	2.5mm
HOT MIXED H2O	-	1.5mm	1.9mm	2.6mm	-	-	1.8mm	2.3mm
HOT MIXED METHAOL	-	1.6mm	2mm	2.3mm	-	-	1.9mm	2.2mm

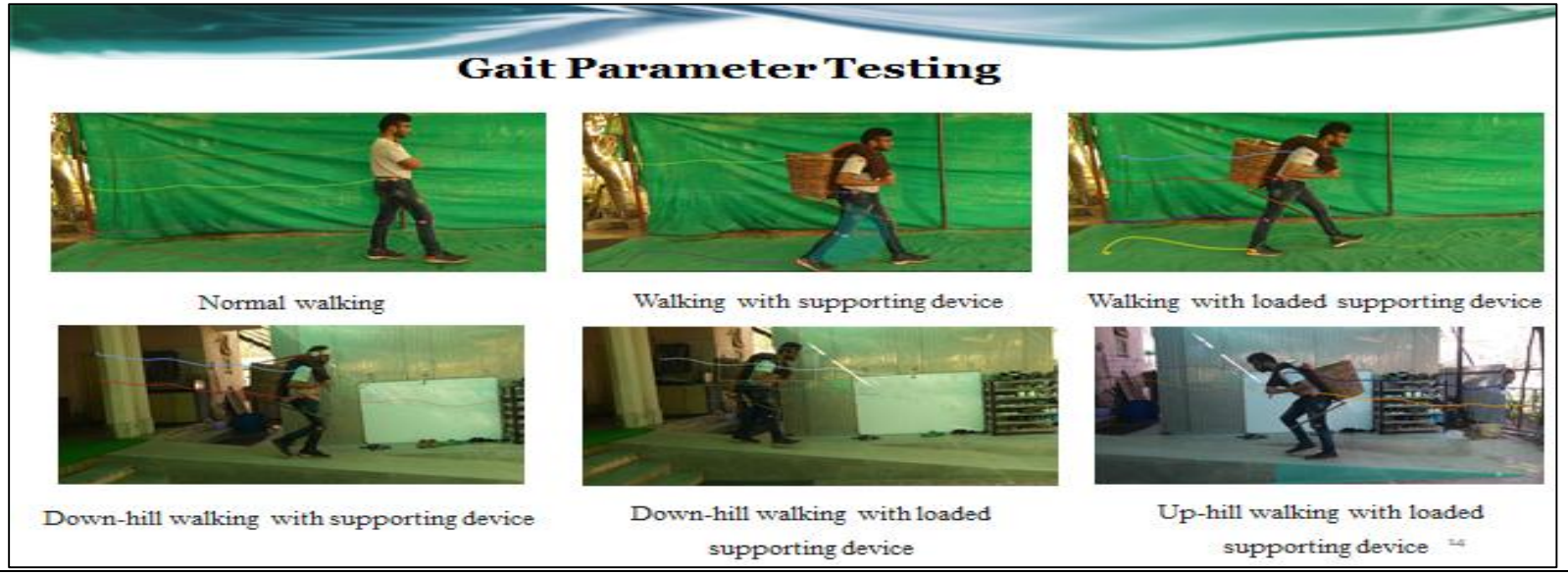
17

Results: - Hot extraction with different solvent as based on polarity. Determination of antioxidant, antiflavonoid & total phenolic content, scavenging activity of DPPH. Antibacterial anti-inflammatory activity

Future work to be done: - Juice of *Salvadora persica* and *Morus alba* with iron= AEROSOL SPRAY

3. **Project Title:-** Ergonomics and Design Improvisation for Load-Carrying Device
   Participant's name: - Akhil V M



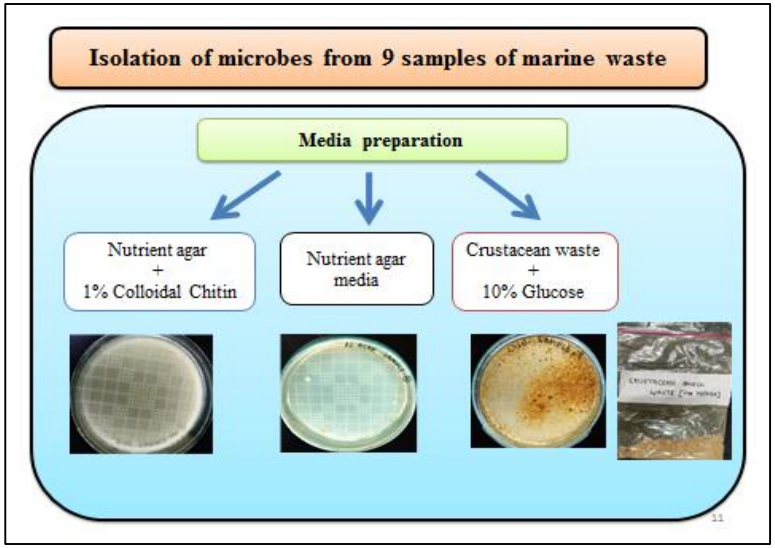


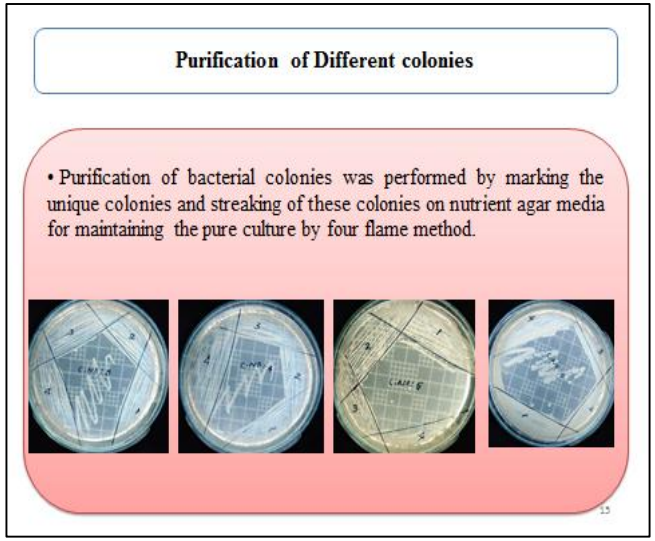
Results: - The design prototype for the load-carrying device was manufactured using cane.

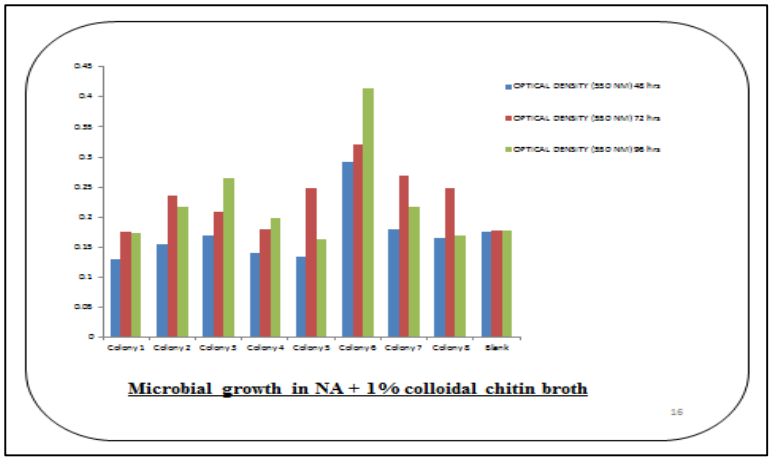
Future work to be done:-

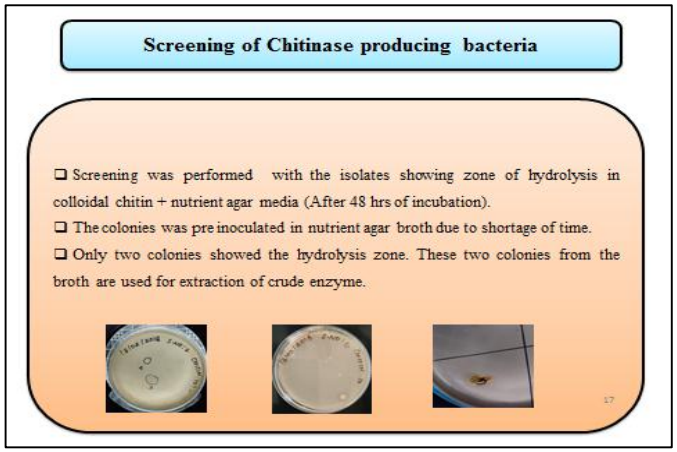
- It can be further improved for effort reduction with the addition of linkages (exoskeleton system) to transmit the load to the ground.
- The design can be made customizable for user needs with the inclusion of the height adjustable system.
- The supporting device design needs to be compared with the actual load-carrying basket used by the Kashmiri women for improvements as required.

4. **Project Title:-** Isolation of chitinase producing microbes from waste of Western coastal region of Gujarat
   Participant's name: - Anita









Results:-

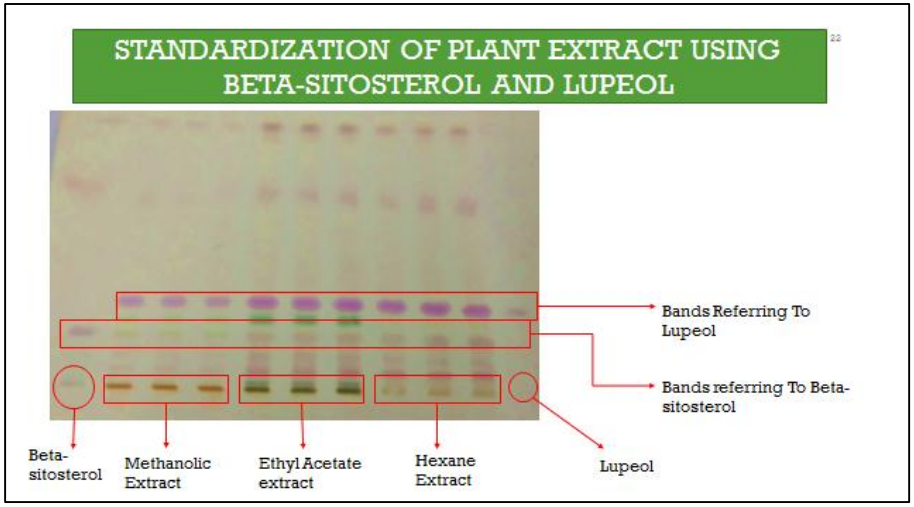
- Chitinase plays important role in the decomposition of chitin and potentially in the utilization of chitin as renewable source.
- Chitinase will also be useful for
- Several therapeutics, pesticides, food preservatives, water purification (chitin and chitosan) can be developed from the processing of pink gold (Shrimp waste).
- Such kind of studies promotes integrated management of Aqua Agri system with the principle of waste recycling.

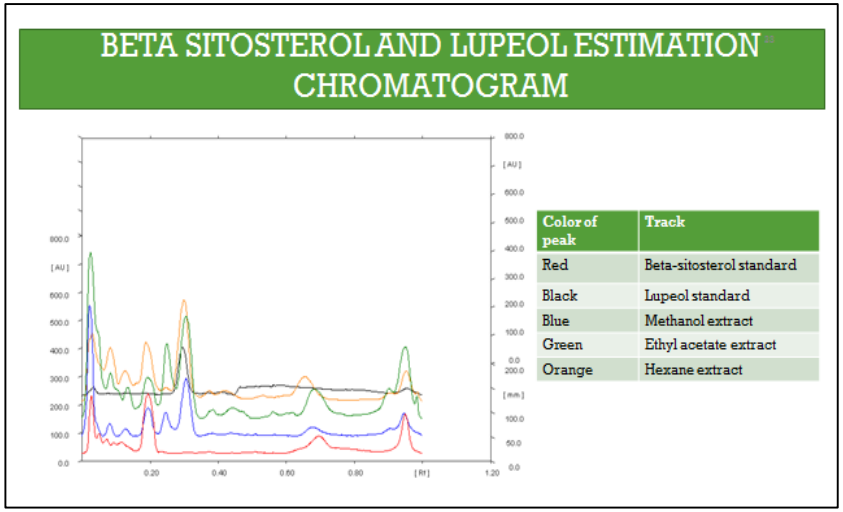
Future work to be done:-

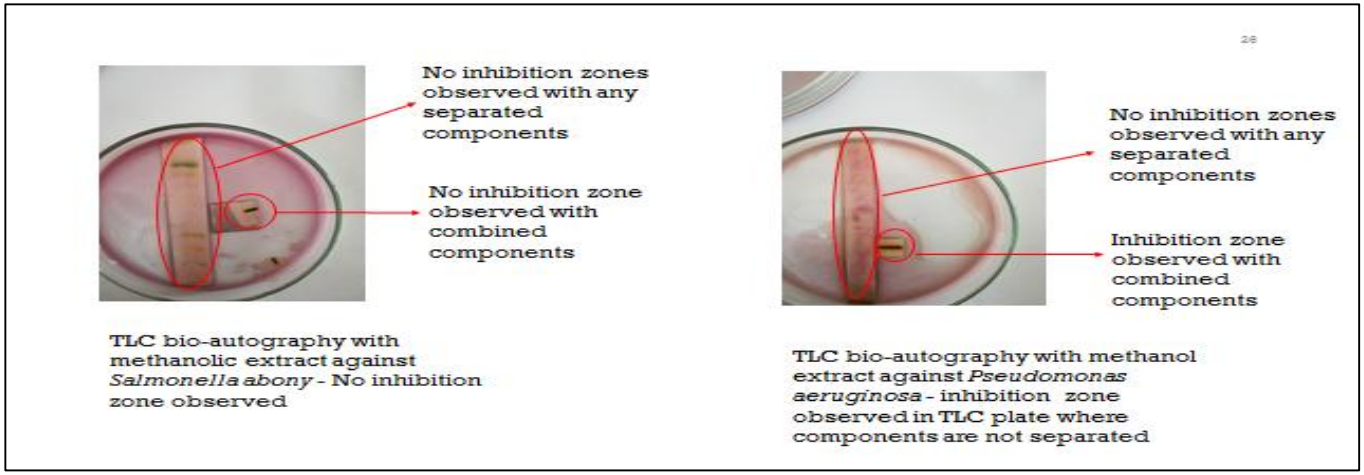
- Identification of isolated microbes by 16 S rRNA sequencing
- Biochemical tests conformation of chitinase producing microbes
- Characterization and purification of extracted crude enzyme
- Use of chitinase (chitohexaose and chitoheptaose) in anti tumor drug development
- Develop a biopesticide for agricultural crops and fungal and insect infection in aquaculture from shrimp waste (pink gold) .
- Chitinase can be potent feed additive for shrimp culture for growth promotion.
- Rapid degradation of crustacean waste by the application of chitinase enzyme

5. **Project Title:-** Evaluation of phytochemical constituents of *Euphorbia hirta* with respect to its anti-diarrheal activity

Participant's name: - Laeba Haider







Results:-

- The practice of the innovator was to treat bloody diarrhea in children using *Euphorbia hirta*. However, based on our phytochemical studies we found out that aqueous medium isn't that good a solvent for the extraction of anti-microbial bioactive compounds from *Euphorbia hirta*

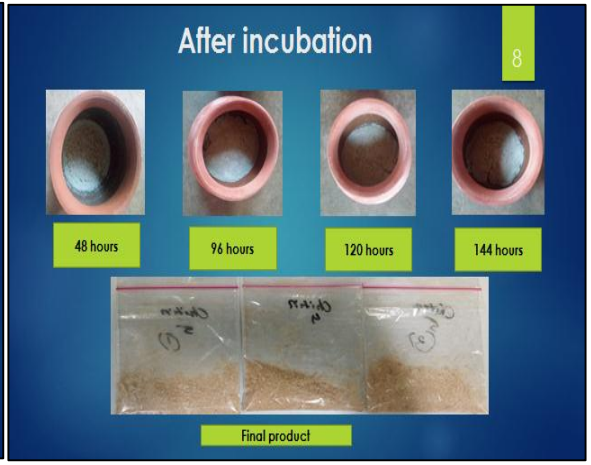
(using the mobile phases we did). That's why we opted for methanol, ethyl acetate and hexane as the suitable solvents for further phytochemical screening of *Euphorbia hirta.*

- Also on checking the methanol, ethyl acetate and hexane extracts for the presence of beta-sitosterol and lupeol we found out that all three of these extracts contain beta-sitosterol and lupeol. Presence of beta-siosterol and lupeol could also be contributing to the anti-microbial activity of *Euphorbia hirta*
- Also, form TLC bio-autography we found out that only the bioactive compounds present in the methanolic extract of *Euphorbia hirta* had some synergistic anti-microbial action against Pseudomonas aeruginosa.

Future work to be done:-

- Finding a better mobile phase for the aqueous extract of *Euphorbia hirta* so that the innovator's practice can be validated.
- Finding out the combinations of bioactive compounds that are responsible for the anti-microbial activity of the plant.
- Once the combinations are known, the focus could be shifted to isolation of the bioactive compounds, either individually for further analysis or in combinations as predicted by the results of the present study.

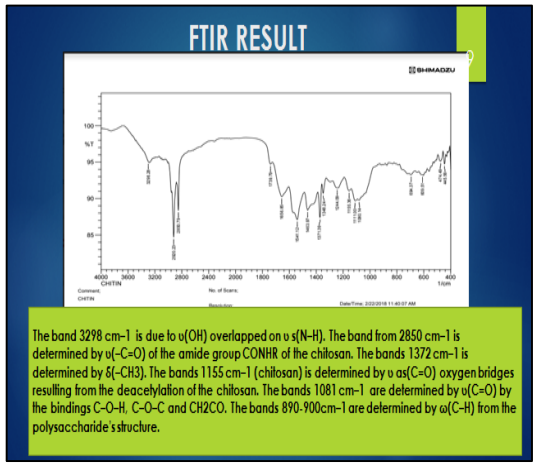
6. **Project Title:-** Development of chitin from shrimp shells an eco-friendly approach by using buttermilk fermentation
   Participant's name: - Deepa D Madathil



Results:-

- Chitin is one of the most abundant biopolymers in nature and is a major component in the supporting tissues of organisms such as crustaceans, fungi, and insects. It has wide application in various fields.
- Biological and chemical methods are mainly employed for the production of chitin.
- The quality of chitosan produce by chemical methods is not homogeneous as compared to biological method. In biological method, chitin is produced by using lactic acid bacteria and produces a good quality product.

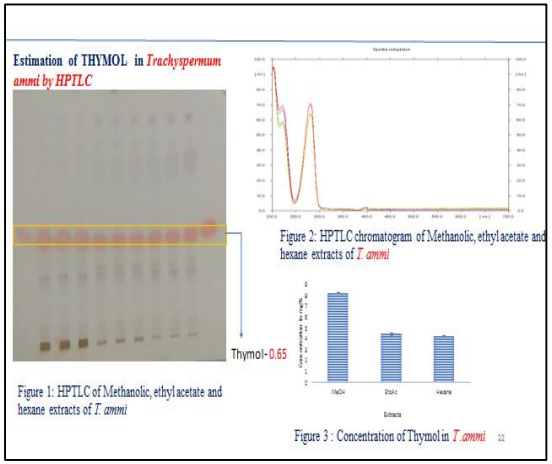
It also leads to a protein rich liquid fraction which can be used as human and animal feed.

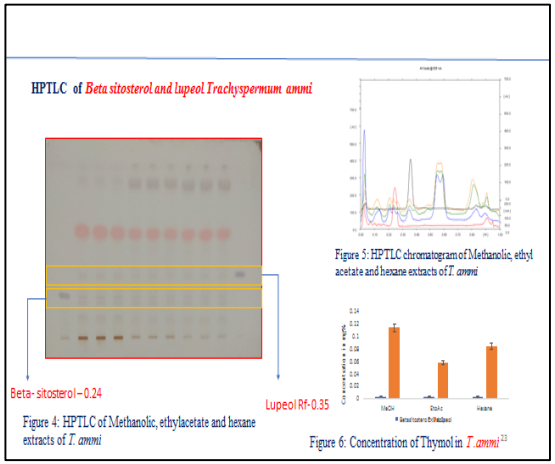


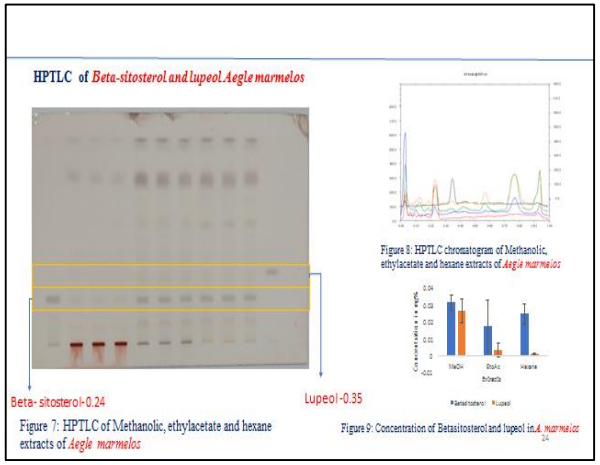
Future work to be done:-

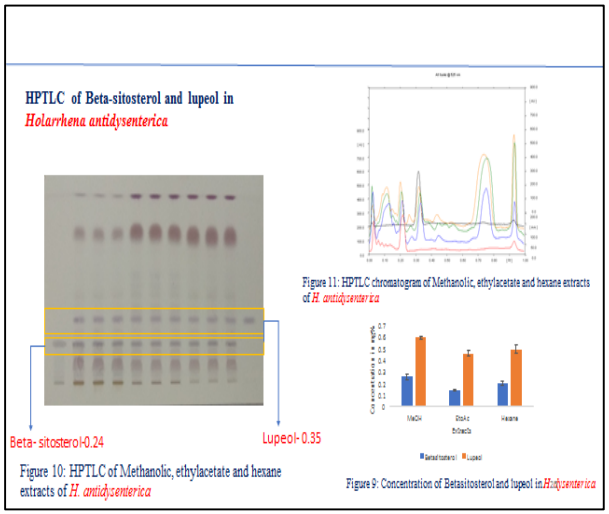
- Characterization of chitin.
- Isolation of proteins and minerals can be done from the waste solution which is exceeded after the preparation of chitin.
- Protein concentrate can be prepared from the shrimp shells.

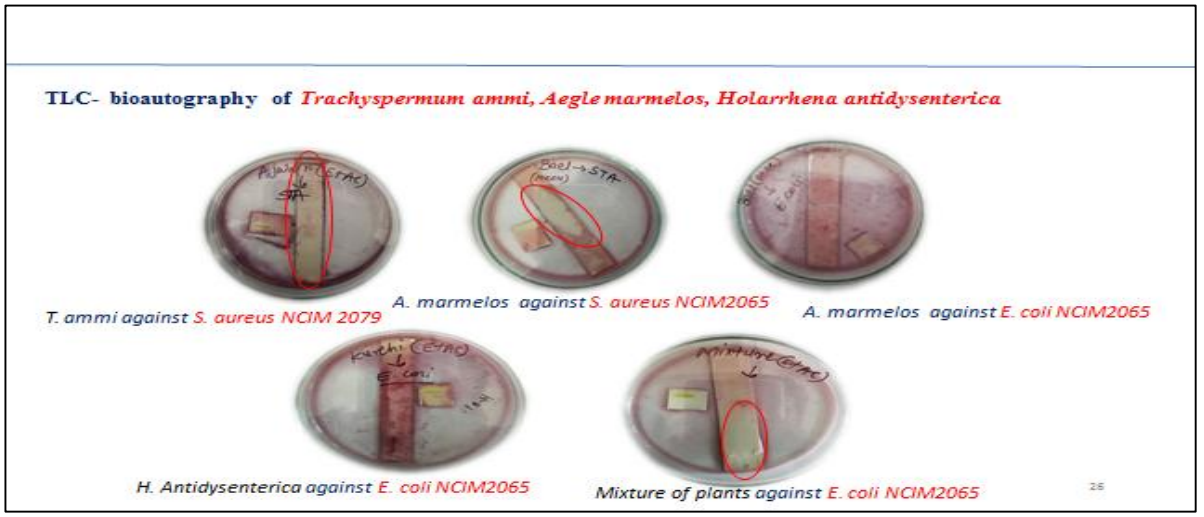
7. **Project Title:-** Photochemistry of medicinal plants of grassroots practices against dysentery
   Participant's name: - Mohan Kumar S











Results:-

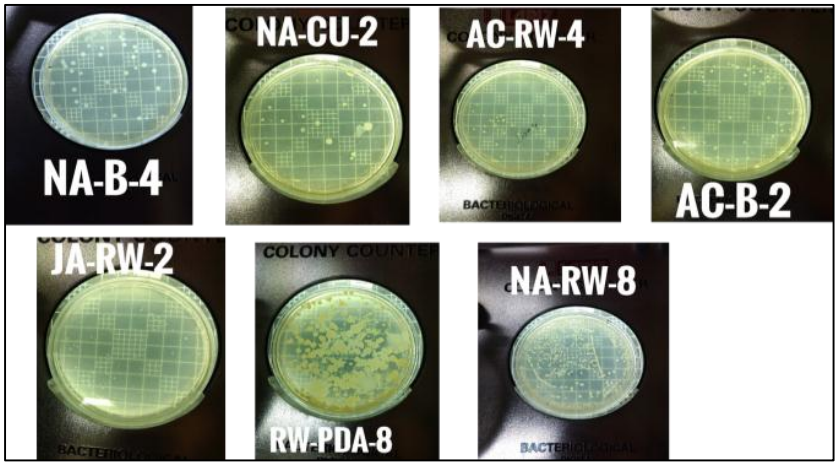
This study showed that all the three plants were able to produce a sterol compounds such as beta-sitosterol and lupeol. Which are found to have potential against several diarrhea causing pathogens

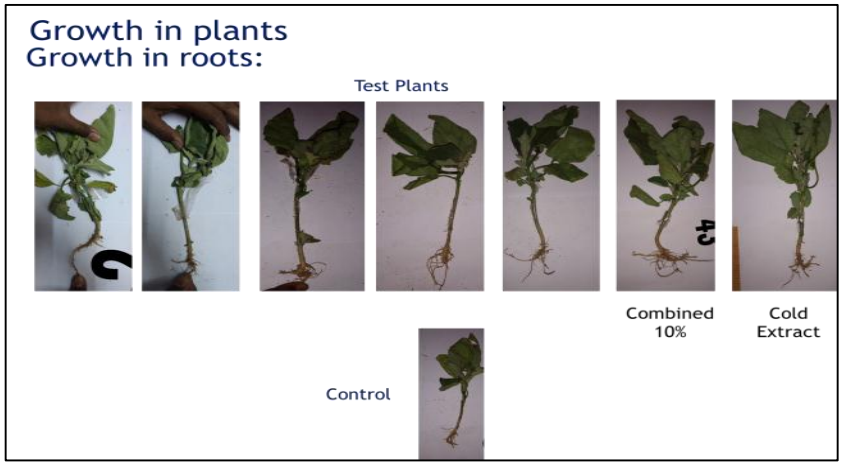
Future work to be done:-

- Extraction of Beta-sitosterol and lupeol from all the three plants
- To check antidiarrheal activity of all the plant extracts and mixture of plants against protozoans and viral particles which causes diarrhea
- Isolation of Thymol from *T. ammi*

8. **Project Title: -** Plant Growth Promoter production from *Cestrum diurnum* by Fermentation & Production of Valuable Chemicals from agricultural waste.

Participant's Name- Mriganka Saha





Growth In shoot

Treatment	Total No. Of Leaves Before Spray	After Spray	Increase in no. of leaves
10% Water Fermentation	11.0	14.3	3.3
30% Water Fermentation	14.7	21.5	6.8
10% Buttermilk Fermentation	7.7	11.0	3.3
30% Buttermilk Fermentation	11.7	18.7	7
10% Cow urine Fermentation	11.0	18.7	7.7
30% Cow urine Fermentation	7.3	11.7	4.4
Combined 10%	**10.0**	**19.3**	**9.3**
Sristi Prahar	7.5	11.5	4
Phosphene 35(Market)	7.3	12.0	4.7
10 % Boiled Extract	10.0	18.0	8
30 % Boiled Extract	9.7	13.7	4
10% Cold Extract	9.0	16.0	7
30% Cold Extract	**11.5**	**25.0**	**13.5**
Water	11.7	17.7	6
Control	9.7	16.0	6.3

Results:

- 1.5 grams of lignin and 2.7 grams of cellulose and hemicellulose was obtained from 10 gram of biomass. Here lot of lignin precipitate and biomass was lost while washing because of inefficient instruments, so this data cannot be used for quantitative analysis.
- Lignin obtained was analysed by FT-IR and functional groups of lignin was detected.

Future work to be done:

- Quantitative studies to be done to know the exact yield of lignin & cellulose, hemicellulose.
- Purity of lignin & cellulose, hemicellulose is to be checked.
- The extraction process is to be optimised.
- Production of commercially valuable chemicals is to be done.

9. **Project Title:-** Study on bioactive compounds and therapeutic potential of *Bergenia ciliata and Quercus incana* extracts for medicinal formulation

Participant's name: - Nivetha A

Result and discussion – Anti-Microbial activity

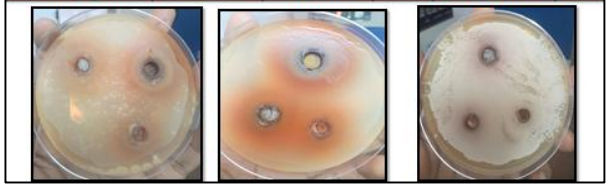
Bergenia cilata

Organism	Zone of inhibition (mm)				
	EA	MET	PE	COLD	HOT
E.coli	-	-	-	-	-
Staphylococcus aureus	25-1, 50-3, 100-5	25- 1.5, 50- 2, 100- 3	-	-	-
Klebsiella	25-1, 0-2.5, 100-5	-	-	-	-
Salmonella typhi	25-1, 50-2, 100-3	-	-	-	-
Listeria monocytogen	-	-	-	-	-

Result and discussion – Anti-Microbial activity

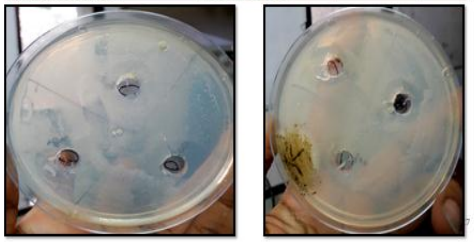
Quercus incana

Organism	Zone of inhibition (mm)				
	EA	MET	PE	COLD	HOT
E.coli	-	-	-	-	-
Staphylococcus aureus	25-2, 50-4, 100-4	100- 1.5	-	25-2, 50-3, 100-3.5	-
Klebsiella Pneumoniae	-	-	-	-	-
Salmonella typhi	-	-	-	-	-
Listeria monocytogenes	-	50-2, 100-4	-	25-1, 50-3, 100-4	-

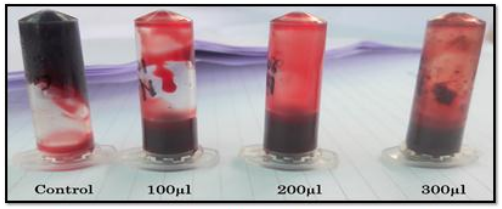


Result and discussion – Anti-Fungalactivity

Organism	*Candida Sp.*, - Zone of inhibition (mm)				
	EA	MET	PE	COLD	HOT
Bergenia cilata	50-3, 100-4.2	--	--	--	--
Quercu incana	--	50-3, 100-4	--	--	--



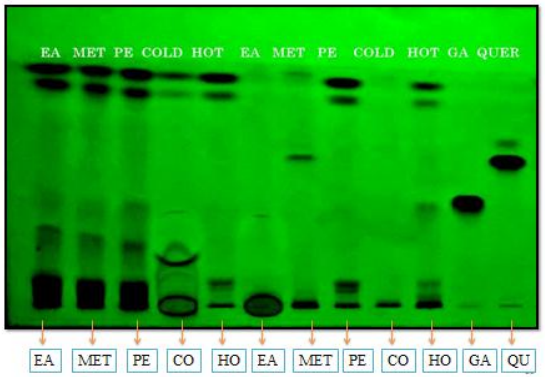
Result and discussion



$$\text{Percentage Lysis} = \frac{\text{Weight of the clot after lysis}}{\text{Weight of the clot before lysis}} \times 100$$

Percentage Lysis = 100µl = 55%; 200µl = 65%; 300µl = 70%

Quantitative analysis of compounds by TLC and HPTLC (Gurav, 2014)



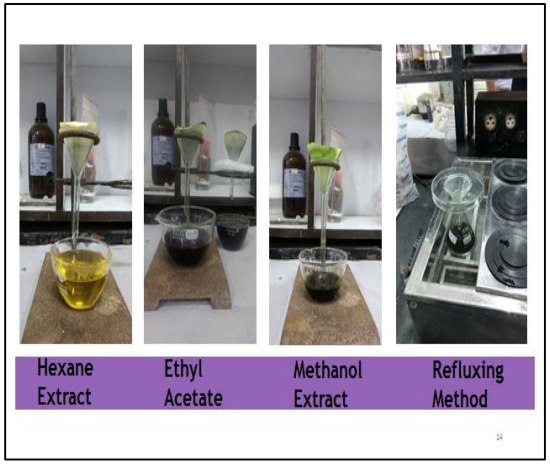
Conclusion

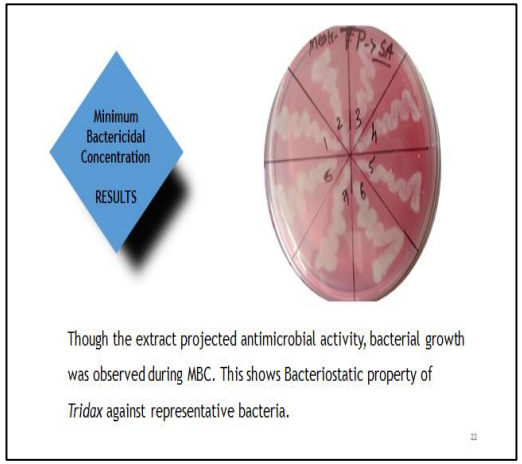
Methods	*Bergenia ciliata*	*Quercus incana*
Yield Percentage	Ethyl Acetate -10	Methanol-8
Phenol	Ethyl Acetate- 5.3	Methanol - 5.7
Flavonoid	Ethyl Acetate - 59.97	Methanol - 60.97
Anti-Oxidant	Ethyl Acetate - 28.41	Pet ether - 55.26
DPPH	Ethyl Acetate - 99.46%	Cold water - 93%
Anti-Microbial	Ethyl Acetate and Met	Ehtyl Acetate, Met, Cold
Anti-Fungal	Ethyl Acetate	Methanol
Anti-Inflammatory	Cold water - 79.51%	Ethyl Acetate - 93.92
Blood clot lysis	Ethyl acetate - 70%	---
HPTLC	Bergenin, GA	Quercitin

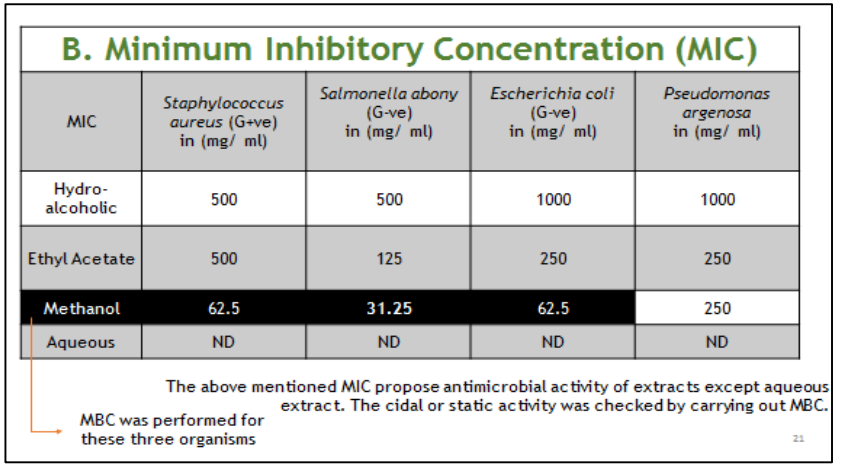
Future work to be done:

- Minimum Inhibitory Concentration – MIC
- To analyze the compound structure – NMR.
- Anti-Cancer activity
- Anti-Diabetic activity

10. Project Title: - Evaluation of antimicrobial activity and phyto-chemistry of *Tridax procumbens Linn*. for anti-Diarrhoea
Participant's name: - Rohit Satyam







Results: -

The plant is preferable to treat Non-Infectious Diarrhoea that is caused by Oxidative stress occurring inside subject's body due to over production of Reactive Oxygen Species (ROS) *Tridax* showed considerable antioxidant activity. % Inhibition did not change drastically with concentration.

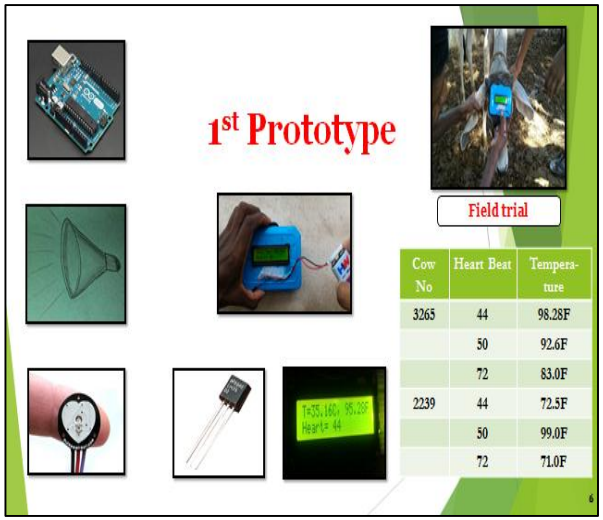
Future work to be done:-

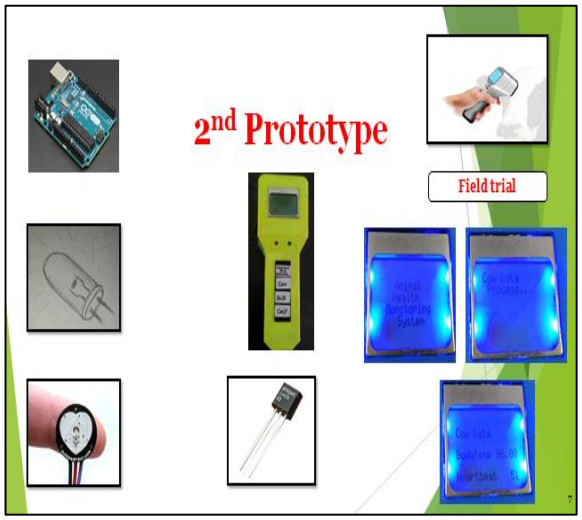
- The extractive value for bioactive components could be enhanced by using *Tridax* of different region besides that of Orissa. With commercialization point of view, the plant should be procured locally since it is easily available weed.

- The extractive value are expected to be high at the time of flowering period. Therefore time of procurement should be considered for better yield.
- The propagation of plant inside a separate facility will aid in maintaining standards and quality.
- In-silico studies on Adenovirus, Norovirus can be performed to search therapeutic and prophylactic candidates for Vaccine development against Viral Diarrhoea. This is advantageous since the preliminary studies for virus in wet lab would be sumptuous and would require higher BSL level and skills.
- The antimicrobial effects can be further studied in causative microorganisms with the high BSL facility, if desired. Clinical trials of controlled subjects are suggested.

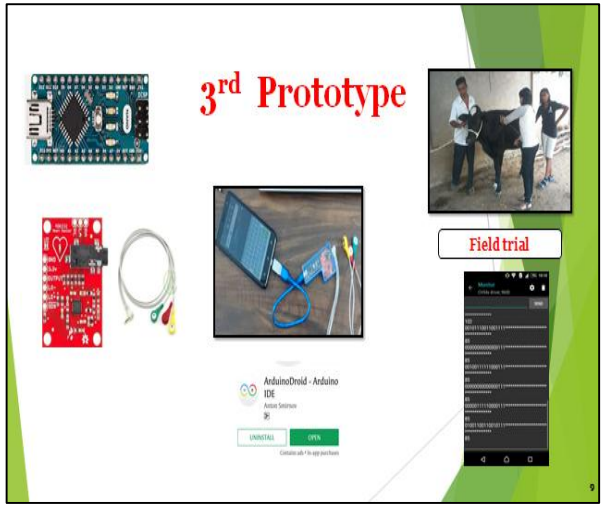
11. Project Title:- Prototyping of Animal Health Monitoring Device

Participant's name: - Vrushali Bhashte, Vrushali Harad, Neeta Jadhav & Saloni Rane





Results:



- Guided by our literature search, we have iterated through two prototypes to settle on our third and current one. These prototypes were designed and fabricated with simple tools and low-cost materials. In addition to a simple and inexpensive fabrication, our device affords unparalleled ease of use among animal health screening devices.
- After the first prototype, we added capability to measure three animals' biometrics, not only cows. The first two prototypes used a Pulse Sensor Arduino module. We increased heartrate sensing precision by replacing the Pulse Sensor module with an electrocardiogram (ECG) sensor commonly used in medical applications.
- Our results indicated precise readings and great ease of use. The temperature readings are divided into three ranges: 30ºC to 32ºC, 33ºC to 35.2ºC and 38.2ºC to 40.2ºC.
- Our device is a powerful tool for first-line health screening to ensure timely detection and treatment of sick animals. It is simplicity prevents educational attainment from barring certain users, while its inexpensive fabrication prevents costs from being prohibitive. With an easy operation and low cost, this device can help farmers keep their cattle healthy and prevent loss of livestock assets.

Future work to be done:

- Waterproofing for safety.
- Wearability for ease of use.
- More biometrics using simple sensors.
- Accurate illness diagnosis.
- Different animals and even human monitoring.

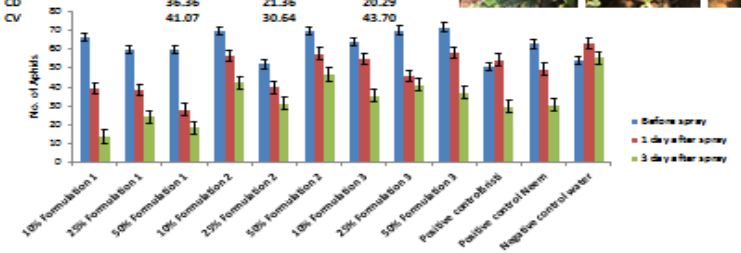
12. Project Title:- Evaluation of Grassroots practice for Crop protection

Participant's Name- Suchita Lade

RESULTS

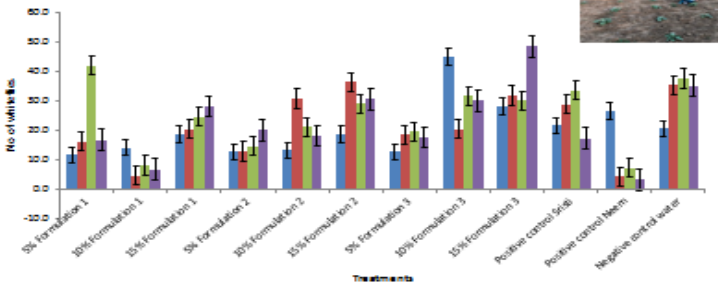
No of Aphids in Cauliflower

Treatments	Before spray	1 day after spray	3 day after spray
10% Formulation 1	66	39	13.67
25% Formulation 1	59.67	38.33	24
50% Formulation 1	59.67	28	18.33
10% Formulation 2	69.67	56.33	42.33
25% Formulation 2	52	39.67	31.33
50% Formulation 2	69.67	57.67	46.67
10% Formulation 3	63.67	54.67	35.33
25% Formulation 3	70	46	41
50% Formulation 3	71.67	58.33	37
Positive controlSristi	51	54.33	29.67
Positive control Neem	62.67	49.33	30.33
Negative control water	54	63	55.33
SEM	12.64	7.42	7.05
CD	36.36	21.36	20.29
CV	41.07	30.64	43.70

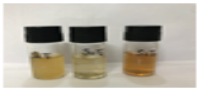


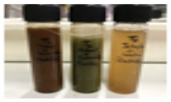
No of whiteflies in Brinjal

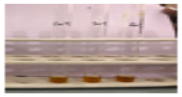
Treatments	Before spray	1 day after spray	3 day after spray	5 day after spray
5% Formulation 1	11.5	16.0	42.0	16.5
10% Formulation 1	14.0	4.5	8.0	6.5
15% Formulation 1	18.5	20.5	24.5	28.0
5% Formulation 2	12.5	12.7	14.5	20.0
10% Formulation 2	15.0	30.7	21.0	18.0
15% Formulation 2	18.5	36.5	29.0	30.5
5% Formulation 3	12.5	18.5	19.5	17.5
10% Formulation 3	45.0	20.5	31.5	30.0
15% Formulation 3	28.0	31.7	30.0	48.5
Positive control Sristi	21.5	28.7	33.5	17.0
Positive control Neem	26.5	4.0	7.0	5.0
Negative control water	20.5	35.5	37.5	33.0
SEM	8.6	7.67	16.85	10.69
CD	25.5	22.49	49.45	31.36
CV	64.0	61.62	92.02	71.55



Parameters	formulation 1	formulation 2	formulation 3
Solubility	Aqueous	Aqueous	Aqueous
Colour	Brown	Green	Pale yellow
pH	4.0	6.0	8.0
TDS	743 ppm	633 ppm	237 ppm

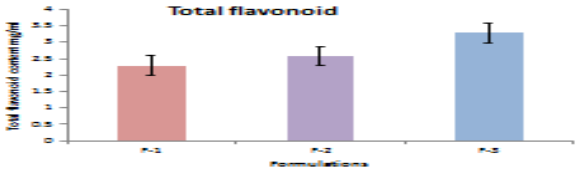


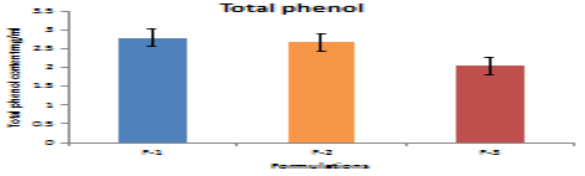




Phytochemical screening

Test Performedal	Formulation 1	Formulation 2	Formulation 3
Terpenoids	–	–	–
Saponin	–	–	–
Alkaloid	+	+	+
Tannin	–	–	–
Flavonoid	+	+	+
Steroid	+	+	+
Phenols	–	+	+





Results:

- The results suggested that the grassroot innovator's herbal formulation F1 (10%) is effective against sucking pest Whitefly in Brinjal
- Further phytochemical analysis of formulations should be carried out to understand the different secondary metabolite compounds present in the formulation and identify the bioactive compounds responsible for the pesticidal activity
- Further we should carried out study on Isolation and identification microbes responsible for pesticidal activity
- Extract of *Azardirachta indica* (Neem) fruit & cow urine will be promising bio-pesticide in economically, eco-friendly manner and sustainable agriculture

Future work to be done:

- Further phytochemical analysis of formulations should be carried out to understand the different secondary metabolite compounds present in the formulation and identify the bioactive compounds responsible for the pesticidal activity.
- Study on isolation identification microbes responsible for insecticidal activity.

13. Project Title:- Evaluation of herbal formulation for Field Efficacy against whitefly

Participant's Name- Salil Kumar Arkvanshi

Results (Compiled)

	Total whitefly count					
Treatments	Before Spray	Day-1	Day-3	Day-5	Day-7	Day-10
CONTROL	12.8	13.0	11.9	12.7	11.8	11.9
WATER	11.8	11.8	11.6	11.7	10.4	10.2
NEEM	10.4	2.4	2.3	2.0	1.6	1.9
SRISTI	10.4	9.1	8.7	8.0	7.2	3.8
LANTANA (Lantana camara) Powder	12.8	12.8	12.6	11.8	11.1	10.4
CASTOR (Ricinuc communis) Powder	13.8	13.8	18.4	17.3	15.8	7.0
SUWA (Avethum graveolens) Powder	10.1	8.6	8.2	7.5	7.0	2.8
SITAFAL (Annona squamosa) Powder	15.0	15.0	14.2	13.4	13.7	8.6
MIX (Lantana+Castor+Suwa+Sitafal) Powder	11.7	6.2	5.5	5.1	4.4	7.6
LCD (Lantana camara)-0.8%	10.4	10.4	9.6	8.8	7.8	7.7
LC200(Lantana camara)-1.6%	10.7	10.7	10.1	11.2	11.9	5.9
LC50(Lantana camara)-5%	12.4	8.1	7.6	7.1	6.6	1.3
LC25(Lantana camara)-2.5%	13.1	8.9	8.5	7.8	7.4	3.6
SED (Avethum graveolens)-7.5%	11.6	2.9	2.3	1.7	1.3	2.7
SE50 (Avethum graveolens)-3.75%	11.7	6.0	5.7	5.1	4.6	4.7
SE25 (Avethum graveolens)-1.875%	10.4	7.7	7.3	6.6	5.8	6.8
SITAD (Annona squamosa)-1.0%	15.0	4.9	4.4	3.7	2.3	1.7
SITA50 (Annona squamosa)-0.5%	10.3	10.3	9.9	8.8	8.4	6.6
SITA25 (Annona squamosa)-0.33%	16.6	13.7	13.2	12.0	10.7	7.0
CED (Ricinuc communis)-7.5%	13.3	4.2	3.9	3.3	2.7	1.4
CE50 (Ricinuc communis)-3.75%	10.0	9.8	9.1	8.2	7.0	4.6
CED25 (Ricinuc communis)-1.875%	10.8	10.8	10.3	9.8	9.6	9.2
MIXED Extract (Castor+Suwa+Sitafal)	9.5	6.1	5.6	4.9	3.8	3.1
MIX50 Extract (Castor+Suwa+Sitafal)	13.0	8.1	7.5	6.7	6.2	5.7
MIX25 Extract (Castor+Suwa+Sitafal)	11.7	5.7	4.9	4.4	4.2	4.2
SEM	3.71	2.90	3.37	3.18	3.14	2.02
CD (0.5)	10.55	8.25	9.57	9.03	8.92	5.74
CV %	53.66	56.81	68.34	68.88	74.35	60.71

Phytochemical analysis of extracts						
Qualitative analysis						
Extract sample	Saponins	Steroids	Flavonoids	Terpenoids	Tannins	Alkaloids
Annona Squamosa	-	+++	-	-	+++	+++
Lantana camara	-	+++	-	-	+++	++
Avethum graveolens	-	++	-	-	-	++
Ricinus communis	-	+	+	-	-	++

Results:

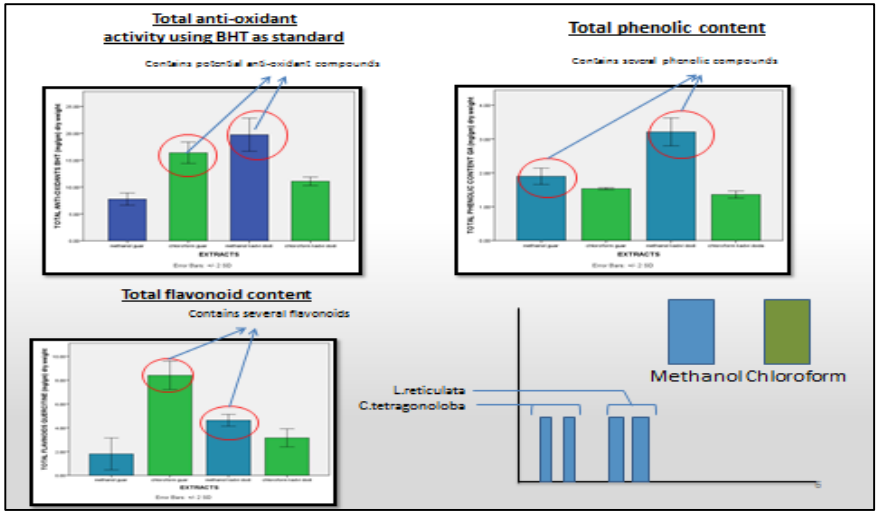
- *Lantana camara* after application provided good control of whitefly at 5%, 2.5%, 1.6% concentration.
- *Avethum graveolens, Annona squamosal* and *Ricinus communis* also have good repellent property and controlling the whitefly population considerably.
- Neem oil, a well known insecticide against sucking pest reported that it is effective from 2-3 ml/L on brinjal, And our treatment shows results in conformity of the same.
- Instead of using powder formulation for sucking pest control, the use of extract is recommended by the present study.

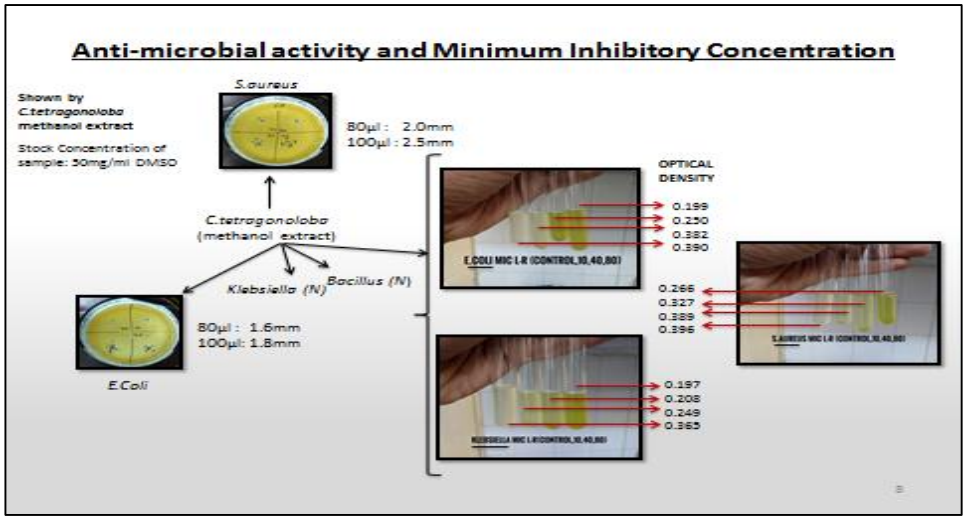
Future work to be done:

- Efficacy of extract for controlling whitefly at different growth phase of crop plant viz. early, middle and late phase.
- In-vitro extraction and purification of the extract and identification of the chemical moiety responsible for targeted pest control.
- From the above studies product development and its optimization will be more easier

14. Project Title:- Validating potential cure for eczema using *L .reticulata* and *C. tetragonoloba* (Atopic Dermatitis)

Participant's name: - Shubhanshu Pandey





- USEFUL RESULT 1 (TOTAL ANTI-OXIDANT) :

1. *L.Reticulata (M)*
2. *C.Tetragonoloba (C)*

- USEFUL RESULT 2(TOTAL PHENOLIC):

1. *L.Reticulata (M)*
2. *C.Tetragonoloba (M)*

- USEFUL RESULT 3(TOTAL FLAVONOIDS):

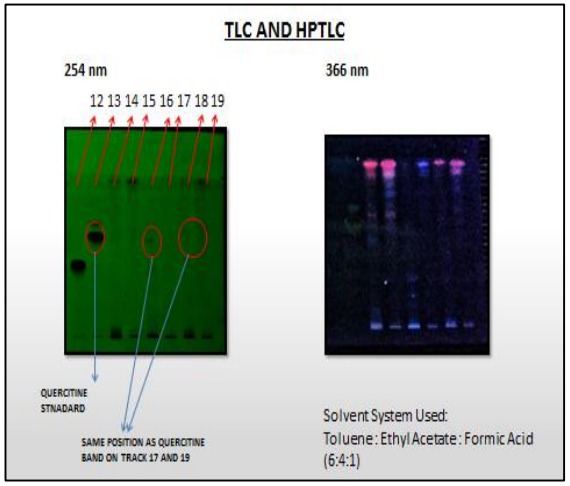
1. *L.Reticulata (M)*
2. *C.Tetragonoloba (C)*

- USEFUL RESULT 4 (DPPH SCAVENGING):

1. *L.Reticulata (M)*
2. *L.Reticulata (C) (High concentration)*
3. *C.Tetragonoloba (M) (High concentration)*
4. *C.Tetragonoloba (C) (High concentration)*

DPPH free radical scavenging activity

PLANT	%ACTIVITY	PLANT	%ACTIVITY
L. RETICULATA (M) 5	68.09%	C. TETRAGONOLOBA(M) 5	65.26%
L. RETICULATA (M) 10	71.79%	C. TETRAGONOLOBA(M) 10	65.64%
L. RETICULATA (M) 25	79.52%	C. TETRAGONOLOBA(M) 25	66.2%
L. RETICULATA (M) 50	85.55%	C. TETRAGONOLOBA(M) 50	67%
L. RETICULATA (M) 100	91.04%	C. TETRAGONOLOBA (M)100	72.46%
L. RETICULATA (C) 5	66.15%	C. TETRAGONOLOBA(C)5	61.67%
L. RETICULATA (C) 10	67.97%	C. TETRAGONOLOBA(C)10	66.54%
L. RETICULATA (C) 25	67.78%	C. TETRAGONOLOBA(C)25	68.29%
L. RETICULATA (C) 50	71.06%	C. TETRAGONOLOBA(C)50	69.46%
L. RETICULATA (C) 100	75.67%	C. TETRAGONOLOBA(C)100	72.54%



ARRANGING THE BEST OUTCOME

PLANT WITH EXTRACT	Anti-oxidant activity	Total phenolics	Total flavonoids	Dpph scavenging	Anti-microbial	MIC study	TLC and HPTLC
C.Tetragonoloba (m)		+		+	+	+	
C.Tetragonoloba (C)	+		+	+			+
L.Reticulata (m)	+	+	+	+			+
L.Reticulata (c)				+			+

Results:-

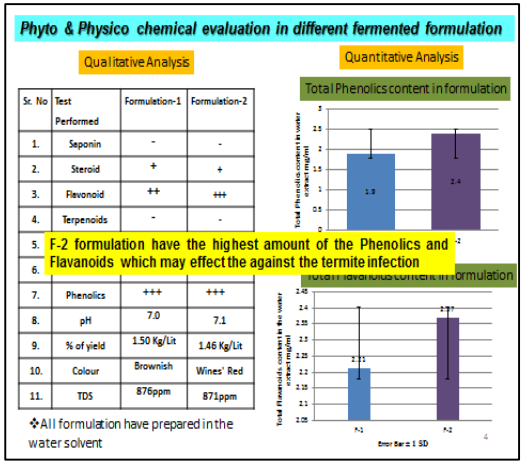
- *Most basic composition of the plant Phyto-constituents.*
- *Specific parts of plant.*

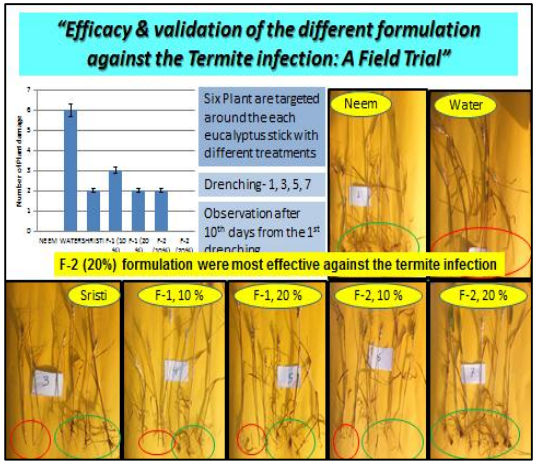
Future work to be done:-

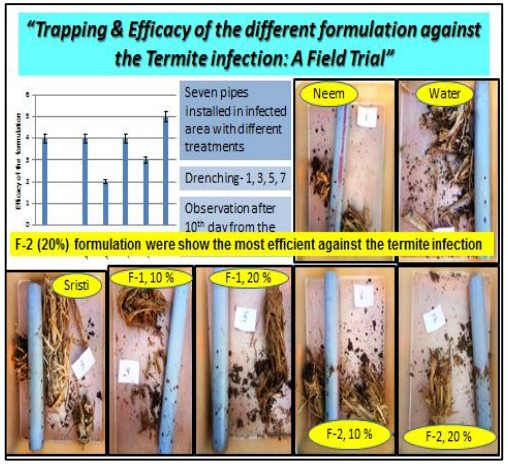
- About the protein filaggrin.
- Can any Phyto-constituent can play a major role in expression of the gene coding this protein?

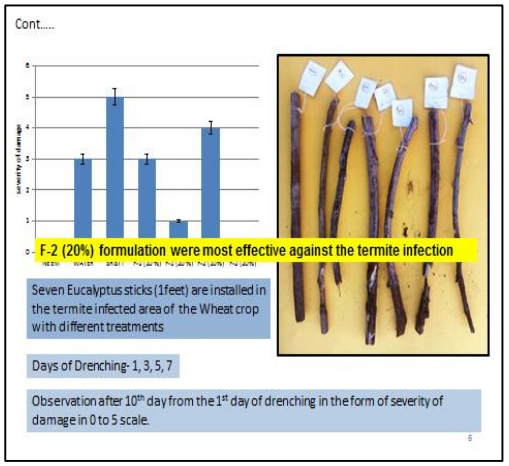
15. Project Title:- In-vivo & in-vitro evaluation of grassroot practice

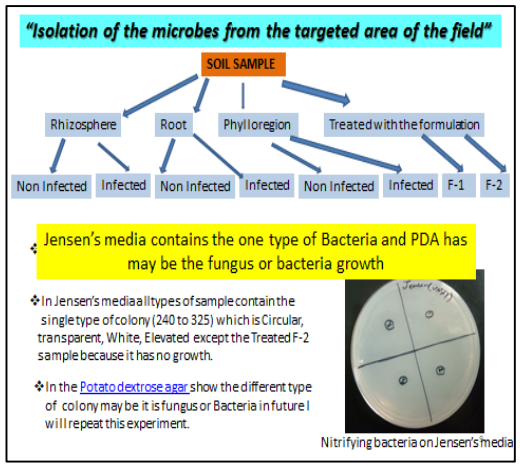
Participant's Name: - Vinay Kumar

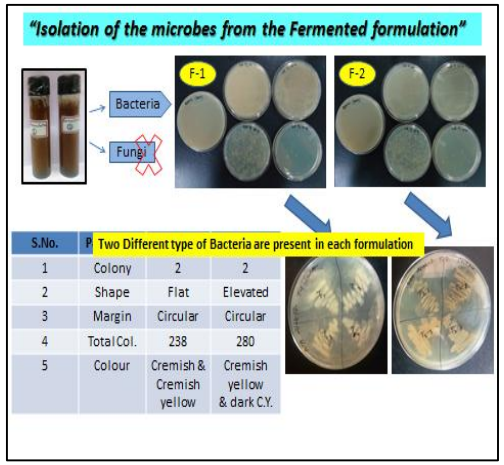












Results:

- F-2 (20%) formulation were most effective against the termite
- F-2 formulation have the highest amount of the Phenolic and Flavonoids which may affect the against the termite infection

Future work to be done:

- Identification and validation of the microbes on the basis of biochemical and molecular
- characterization
- Standardization of mobile phase and extraction of the Key compound through TLC
- or HPTLC or LCMS
- Repeat the field experiments with the isolated microbes in permutation combination