

Mangiferin Prodcuts and Black Gold: An end-to-end Project

Mumbai, IndiaMumbai, India



Vrushali Kulkarni



Year Founded:
2013

Organization type:

government

Project Stage:

Start-Up

Budget:

\$1,000 - \$10,000



- [Global Warming](#)
- [Climate change](#)
- [Green consumerism](#)
- [Sustainable agriculture](#)

Project Summary

Elevator Pitch

Concise Summary: Help us pitch this solution! Provide an explanation within 3-4 short sentences.

The project is an end-to-end venture, where we have extracted essential biomolecules like mangiferin from waste leaves and also utilized the waste byproduct as biochar, a carbon sink. Our study showed that mangiferin has comparable anti-oxidant and anti-bacterial activity to some market products.

WHAT IF - Inspiration: Write one sentence that describes a way that your project dares to ask, "WHAT IF?"

What if biochar produced from waste leaves or agricultural waste could reduce the carbon levels in the atmosphere and help in reducing global warming that is threatening to destroy the world?

About Project

Problem: What problem is this project trying to address?

1. India has a large number of mango trees generating huge amount of dried mango leaves as a solid waste. 2. The consumer market is flooded with anti-aging creams that are created from synthetic chemicals that are harmful. 3. There is lot of scope for making better anti-diabetic products than those prevalent in market 4. Carbon levels have increased at an alarming level in the past few decade posing a grave threat to mankind

Solution: What is the proposed solution? Please be specific!

1. Waste mango leaves can be utilized to extract useful biomolecules like mangiferin and create biochar out of the byproduct 2. There is a huge potential of anti-aging,whitening cream made from mangiferin as mangiferin has comparable anti-oxidant and anti-bacterial activity to market products 3. Formulation of mangiferin anti-diabetic medicines can create a potent alternative to the solutions already available 4. If biochar is used globally, CO2 levels could drop by at least 8 parts per million. Also biochar will increase soil productivity thereby providing increased local and national food security, commerce and export. It can help governments meet local, national and international, greenhouse gas emission targets

Awards

Won 1st prize in Chemcon 2014, conference by IChE, Consolation prize in Outstanding Young Chemical Engineers competition and Finalist in IChemE Singapore event

Impact: How does it Work

Example: Walk us through a specific example(s) of how this solution makes a difference; include its primary activities.

The project provides multiple solutions to various issues 1. Waste mango leaves are usually burnt or cause unplanned land filling. They will now be utilized effectively. 2. Anti-aging and whitening products made from herbal ingredients 3. Better anti-diabetic product 4. Biochar formed from waste leaves after extraction of mangiferin has potential to create a large biochar industry in rural India. It increases soil productivity as can be seen from field experiments in University garden. Also it reduces the carbon dioxide levels and thereby proving an effective remedy to reduce global warming.

Impact: What is the impact of the work to date? Also describe the projected future impact for the coming years.

I have already published 4 papers in the project in journals like Green Chemistry and Synthesis, Industrial Crops and Products etc. and 3 others are in the pipeline. The project is funded by Government through Rajiv Gandhi Science and Technology Commission, Government of Maharashtra. Through this funding, experiments in large scale have already started. The project is expected to touch the rural India with farmers becoming more secure with respect to food crops. Also if biochar replaces chemical fertilizers at a wide level, it will have a huge impact. Soil productivity will increase that will help the farmers. The food security situation in India will improve significantly. Also biochar will not be toxic like chemical fertilizers. Moreover biochar is carbon negative and will act like a carbon sink. This will help in reducing the carbon dioxide levels by at least 8 parts per million

Spread Strategies: Moving forward, what are the main strategies for scaling impact?

To successfully take the project from lab scale to large scale, we intend to open a factory for extraction of mangiferin from waste leaves. Product development for cosmetics and medicines can be outsourced in labs of companies like Unilever. The residual leaves will be converted to biochar in the factory. Wide spread campaign across rural India will be employed to spread the awareness among farmers of the benefits of biochar compared to chemical fertilizers. If biochar is used across rural India, it is likely to have huge positive impact on the environment.

Sustainability

Financial Sustainability Plan: What is this solution's plan to ensure financial sustainability?

The project is funded by Rajiv Gandhi Science and Technology Commission, Government of Maharashtra for PhD. I also received financial Travel aid from Department of Biotechnology, India and Abhyankar Award, India. The cost requirements for this project are minimal as it utilizes waste product like waste mango leaves. The requirement of chemicals and equipment is basic. The wide application of project itself makes it financially sustainable.

Marketplace: Who else is addressing the problem outlined here? How does the proposed project differ from these approaches?

The project differs from others in the sense that this is an end-to-end project. This project tackles multiple issues together like waste management, global warming, formulation of medicines and cosmetic products from natural products. While there would be competition in each of them individually, but I have not come across a project which can form a solution for so many issues together.

Team

Founding Story

I was inspired at making my PhD project not just something that will discover new things but also something that will have a deep impact in the society. Waste mangement is still not looked at very seriously. Also climate change has become an integral part of modern lifestyle. My project combines solutions for both and also produces a product that has potential to be better than the current products.

Team

This is a PhD project of Vrushali Kulkarni in Institute of Chemical Technology, Mumbai, India

File attachments:



[biochar field studies.png](#)



[conclusion of the project.jpg](#)



[our herbal antibacterial gel formulation from aqueous leaves extract of mango leaves.jpg](#)



[extraction of mangiferin and utilization of waste leaves as black gold -brief summary-.pdf](#)

Background

Please confirm how you heard about the Unilever Awards:

Internet

Please confirm your role in the initiative (eg Founder/co-Founder) and your organisational title:

PhD Project in Institute of Chemical Technology, Matunga, Mumbai

Which of the 8 UN Global Goals (Sustainable Development Goals) pre-selected for this competition does your solution relate most closely to? [select all that apply]

Responsible Consumption and Production, Climate Action.

Leadership and the Unilever Awards

Please provide examples of any previous entrepreneurial initiatives you have pioneered.

I am a registered pharmacist of Maharashtra State Pharmacy Council. I have completed in-plant Training in various pharmaceutical sections at Milan Laboratories (India) Pvt. Ltd., Navi Mumbai, India. I have also visited Elder Pharmaceuticals plant in Navi Mumbai, India and learned manufacturing of various pharamceuticals products. These industrial experiences will help me in formulation of mangiferin products. Also I have tried biochar products from mangiferin in my University garden and there was a substantial increase in growth of plants. Thus the project is expected to

be in the vanguard of green waste management and sustainable technology.

Beyond your existing team, who else are you working with to achieve your objectives, eg partners, advisors, mentors?

I am working on the project under the guidance of Dr. V.K. Rathod in Institute of Chemical Technology, Mumbai, India

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