

# Plastic Using China Grass

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**Abstract:** For my project, I am going to make a bio-Plastic using materials that are Natural. And try to prove that Plastics can be Replaced by these kinds of methods to avoid harmful diseases caused by toxic plastics. The plastic that we use are created through a chemical process with fossil fuels to make polymers (long chains of molecules). These plastic polymers take a long time to break down potentially 1,000 years in a landfill. My plastics are better for the environment as they are not derived from petroleum products. This plastic can be easily degraded and helps to avoid the landfills that are happening. These can also be easily made at home with a few simple ingredients. Also, I hope that this would help the world to be a better place and safer place.

**Keywords:** China grass, Environment, Plastic.

## 1. Introduction

This is a project that I've been working on for the last two years.

I have a very deep concern about the ocean and the other creatures which are living with us.

There are 300 million tonnes of plastic waste every year and only 25% of plastics are being recycled. At least 800 species worldwide are affected by marine debris, and as much as 80% of that litter is plastic. Changing the Non-Degradable plastic into Bio-Plastics which are safer for Animals including us.

After I made the project of NO PLASTIC, PLASTIC! I always wonder what are the other methods to make bioplastic,

What are the other methods to improve it?

How can I make it more aware to people?

And then my brain detected the idea....

Hey! Why not? Try it with CHINA GRASS And here I am with the project.

NO PLASTIC, PLASTIC! 2.0.

Sea Turtles.

Seals and Sea Lions.

Seabirds.

Fish.

Whales and Dolphins.

These are the Animals that get immensely affected by the plastics.

Marine animals, mistake plastic waste for a viable food source, sometimes causing blockages in their digestive system.

The fact that plastics would never get degraded & just shatter into pieces so small until we couldn't see. And We drink, Eat and EVEN BREATH (can you even imagine we even breath) PLASTIC.

It's just so mesmerizing to see people are acquainted about

the flaws and cons about Plastic and they still want to use plastic, despite the fact that there are a ton of alternatives available.

People in Power don't care. Government won't care. We have to be the one who starts the change even though it makes only a tiny bit of a change.

A Change IS STILL A CHANGE. AND IT MATTERS.



Fig. 1.

### A. Current Status of Bioplastics

Bioplastics are plastics materials produced from renewable biomass sources, such as vegetable fats and oils, corn starch, straw, woodchips, sawdust, recycled food waste.

Bioplastic can degrade very soon whereas the plastic that we use shatters and shatters, as I said above.

Bioplastics are currently used in disposable items like packaging, containers, straws, bags, and bottles, and non-disposable carpet, plastic piping, phone casings, 3D printing, car insulation, and medical implants.

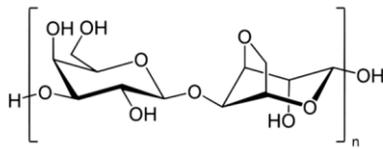
### B. Background Information on China Grass

Here, I also studied about the structure about my independent variable i.e., China grass and also about oil to know more about the nature and the texture of my ingredient (*Urtica nivea* Linn.).



Fig. 2.

$\alpha$ -1,4-linked 3,6-anhydro-L-galactose

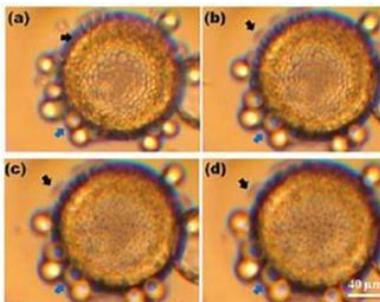


$\beta$ -1,3-linked- D-galactose

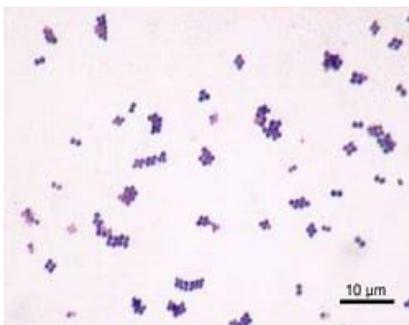
Fig. 3. Structure of China grass

China grass has a spontaneous property.

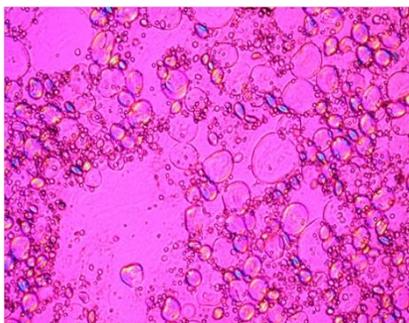
To get hold to the substance while added to water. This property is helpful for bringing the compound to a solid form. The China grass after solidify it does not again turn into liquid i.e. They don't melt, they need 85 degrees Celsius to melt which means it won't melt in room temperature. This property is immaculate for PLASTIC.



(a) Oil



(b) China grass



(c) Glycerin

Fig. 4. The structure of oil, China grass and Glycerine liquid under a microscope (Source: Google)

*Looking upon the properties of oil and China grass.*

The oil made the substance harder whereas the China grass made it more of a rubbery substance. Even though it did have an elastic property at the beginning, it oddly made the plastic more rigid as it was drying.

*C. Statement of the Problem*

I have a pond near my school. On the way I used to think why this place is dirty and why it is filled with plastic bags. I pondered what if we burn it all up and then I realized that it will release toxic gases. And that's when I came up with a flash to make bio plastics.

This is where it all started. I then made a plastic using vegetable oil and now here I am making Plastic using China grass.

In my last project my future enhancement was to develop bio plastic and make it thin as chocolate wrapper or thick as a brick. I found that using China grass, we can easily make the plastic thinner, the plastic from the oil was thicker than this.

I was suggested by the Judges last time asking me to try it with China grass and I wanted to give it a try.

And here we are with, CAN WE MAKE PLASTIC USING CHINAGRASS.

*Objective:*

*My Question:*

Can we make plastic using China grass?

*Why this problem has to be solved?*

I see plastic as the most problematic substance for the living beings, not only for animals also for humans. Due to the tremendous creatures which are being affected due to the use of plastic and also to live peacefully as much as the human does. Also, to get a full view of what the world is going through when nature gave you all the alternatives.

I would like to highlight the problem that called my attention, The problem of A sperm whale that washed up at the Wakatobi National Park in Indonesia in December 2018 had 115 cups, 25 bags, four bottles and two slippers in its stomach.

*Why should we convert to bioplastic?*

They are better for the environment because they are not derived from petroleum. As I am trying to make plastic to be easily available, cost efficient, homemade and eco-friendly this can be the future of plastic and using them might perform a cosmic evolution of a more preferential world.

*Hypothesis:*

Can plastic be made of CHINA GRASS?

The procedure may vary due to the change of independent variable.

**2. Procedure**

*Independent Variable*

- China grass

*Dependent Variable*

- This does most affect any other products

*Controlled Variable*

- Water
- Corn starch
- Vinegar



Fig. 5.

**Procedure:**

First soak the China grass and wait for 20-30 min.

After soaking boil, it in medium flame until you dissolve the grass.



Fig. 6.

When the liquid is clear keep it off the stove and we are good to go to the next step.



Fig. 7.

Make sure you act fast; we don't want the liquid to solidify.

Now in another vessel burn corn-starch and vinegar after mixing it without any lumps add the liquid into the substance making it thicker.

Spread the sticky substance into a suitable surface and let it dry very well for a day or two, until it feels dry to touch.

The sheets have a very brittle structure. We end up getting the sheet into pieces, it's not a sheet. But still the sheet is more brittle and light form of particles with which we can use as plastic.



Fig. 8.

**Risk and Safety:**

Even though this project is very simple and effective but still risk and safety has something to do with the procedure of my project.

- The vinegar and Starch give you an irritating smell. which may cause allergy.
- The sticky substance in our cooking pot which will be very hot so we have to be very careful when spreading to sheets.

**3. Result**

As per the results we can conclude that, YES! WE CAN MAKE PLASTIC using Chania grass.

The results of the Plastic turns to be very much like plastic, to touch and to feel. The result I was looking was a very brittle one but in contrast it was not.

**Possible Errors:**

It may break if the sheet is not spread well or in a suitable surface, if the sheet is not completely dried then you might have the plastic wet If you over dry it the plastic might break.

**Question that raised while working on this project:**

How long would this plastic take to degrade?

**Variation of Data:**

I was surprised to see how the jelly-like substance slowly turns to be a hard and a fragile one.

**A. Data Analysis**

My data analysis collects the data of

- How many times I have made the plastic?
- How was the texture of the plastic each time?
- How many times I've changed the ingredient's ratio each time?
- How much time it took me each time to make the plastic substance?

Table 1

No. of time I. Made the plastic	The texture of the plastic each time	The stuffs I've changed	Time required each try <sup>1</sup>
1	Soft, wet, lumpy	Vinegar	50 min
2	Soft, wet	Changed the procedure	40 min
3	Hard and dry but lumpy	Changed the procedure (final)	40 min
4	Brittle, soft, more thin.	Made the sheet more thin and spread	20 mins
5	Brittle, Soft, More thin.	Made it large	20 mins

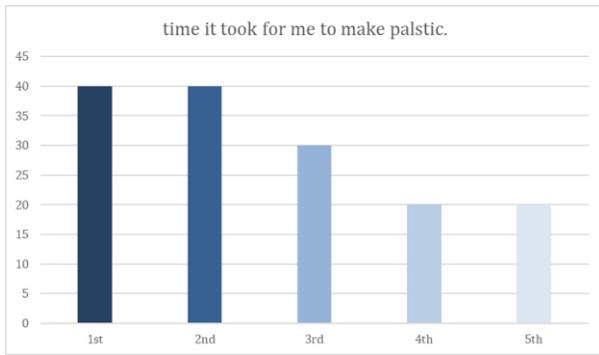


Fig. 9.

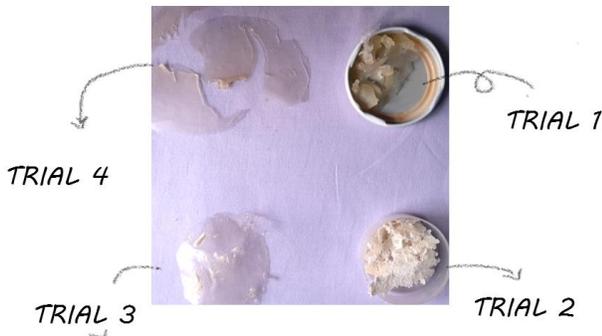


Fig. 10.

The two types of plastic I got. They both have different textures and different procedures.



Fig. 11. Type-1



Fig. 12. Type-2

*Type-1:*

- This was a clear one with a lot of cracks.
- Even though this was dried for a long time it had the same structure but got more brittle.

*Type-2:*

- This was also clear one but it had some chunks of corn starch by the time it became very hard.
- This was dried for the same time also had the same effects of breaking.

**4. Discussion**

- As my project is completely made of natural products, they can be easily degradable in a few days.
- By making the substance semi solid or liquid we can decide the thickness of our plastic.
- Over drying may lead to cracks.
- No drying may keep the substance wet.
- Has some order of corn starch but it's not hard.

These would definitely help in the making of better place and the world would be more of a happier place. Even though plastic is not our only problem we can handle this global warming by reducing some or the other things that we can. Bio plastic is one of the ways. There are many bio plastics found before with different ingredients and here's the other method of making bio plastic.

*Why another method?*

Even though there are a huge number of bio plastic found the usage of bio plastic is not increasing. This is because of two reasons according to me

- 1) They are not aware
- 2) They could not afford

I would suggest all the people should stand by this and make it more aware by the people. And government also should help to take this to people

*Application:*

“Yes, we can make Plastics with Vegetable Oil”

Where can bio plastics be used?

- Carry bags
- Kitchen utensils
- Chocolate wrappers
- Phone covers
- Zippers
- Water Bottles
- Vegetable fats and oils
- Corn starch
- Straw
- Ziploc Baggies

And much more ....

Just changing the portions of vinegar and China grass liquid can make the difference in the plastics consistency and can be used in different places. This can be very helpful on reducing the usage of toxic plastic and also the marine life would be much clean. The literate humans like us just want to be selfish already we have destroyed a lot of lives that lives in atmosphere and we are also we are destroying the marine life.

Materials such as starch, cellulose, wood, sugar and biomass are used as a substitute for fossil fuel resources to produce bio plastics; this makes the production of bio plastics a more sustainable activity compared to conventional plastic production.

Biodegradable plastics can be applied in a range of useful ways. They can be foamed into packing materials, extruded, and injection-moulded in modified conventional machines. Different types of fillers can be used with the system, such as wood flour, lime, clay, or waste paper. The fillers can be coloured and also used in various granulation sizes to change the material's external appearance.

### 5. Conclusion

And I will be focusing more on changing the chocolate wrappers, medical things which use plastics and mobile covers.

My Hypothesis "Yes we can make Plastics with Vegetable Oil" has been proved

We can make Plastic using Vegetable Oil. Which helps a lot in environmental issues? We can also make the world a better place to live not only for humans also for other creatures

#### Future Enhancement:

I wish to continue my project in the future to make sure that a lot of people starts using bio plastics instead of toxic plastic and also, I may try to make the plastic to be in other state too like rubbery to make and thin like paper to use in wraps.

And also try to make plastic using other procedures and other bio ingredients.

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- [2] <https://en.wikipedia.org/wiki/Bioplastic>

### Appendix: Log Book

