## Introduction, background, purpose

In recent years, Macau has seen frequent red tides (a kind of algae blooms, a kind of marine disasters) in the Hac-Sá Beaches and the Cheoc-Van Beaches area in recent years, which not only has a serious impact on local residents, but also causes serious pollution to the ocean. Therefore, we hope to use some common aquatic plants to purify the water source.

## Causes of red tide：

Red tide is a natural phenomenon, and it is also caused by human factors, but it is not necessarily a harmful ecological phenomenon.
The main causes of red tide are:

- Eutrophication
- Large amounts of industrial wastewater and domestic sewage are discharged into the sea
- Marine development (e.g. aquaculture)
- The development of the shipping industry has led to the introduction of harmful red tide species from outside
- global warming

## research method：

1. Preparation of *Cabomba caroliniana* extract. Rinse *Cabomba caroliniana* with tap water and dry it
2. Take 100g of dried *Cabomba caroliniana*
3. Crush with tissue masher
4. Add 250ml artificial sea water soak for 96h
5. Filtered under reduced pressure through a 0.22um Na fiber filter membrane with a pore size of 0.22um to obtain 100g/L of leachate

## Results, data and phenomena:

-In the concentration range of the extract in the experiment (0.5-100g/L), the extract of *Cabomba caroliniana* liquid and the extract of *Cabomba caroliniana*(dried at 80°C for 48h) have an inhibitory effect on the red tide algae. The effect increases with the concentrations.
-There is a certain difference in the inhibitory rate of *Cabomba caroliniana* liquid and dried Cabomba caroliniana.
-High temperature can change the activity of allelochemicals in the leachate
-The inhibitory effect commonly exists. Cabomba caroliniana contains chemical substances that can kills red tide algae. It is necessary to do further research on its composition and structure to provide a certain amount of algae inhibitors reference.

## conclusion:

Based on the frequent occurrence of red tides in Macau in recent years, this study carried out an experiment based on the algae-inhibiting efficacy of *Cabomba caroliniana*, and designed the extraction and performance study of *Cabomba caroliniana* tissue extract. The purpose is based on the excessive reproduction speed of red tide algae, so this experiment was carried out:

Research on its algae-inhibiting properties based on *Cabomba caroliniana*. algae tissue extract. The in-depth research on the inhibitory effect of *Cabomba caroliniana* on the red tide algae will provide a basis for the biological control of *Cabomba caroliniana* and the development of natural algae inhibitors. At the same time, *Cabomba caroliniana* may be used in red tide control to solve the damage caused by excessive reproduction of *Cabomba caroliniana.*

After experimental tests, the extract of *Cabomba caroliniana* algae (algae-inhibiting properties) extracted in this study has good performance and has great development prospects.