

Building where algae is cultured

MOYUX




Absorption



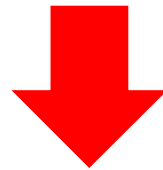

Production



Niigata Prefectural Takada Senior High School

○World challenges

The emission of **carbon dioxide**



Global warming

1. Reason for choosing algae

- ① No need to worry about soaring food prices.



② Oil productivity is high

vegetation	oil production L/ha/year
corn	172
cotton	325
soybean	446
algae	136,900

Algae produce 10 to several hundred times more oil than plants.

③ Algae that produces oil

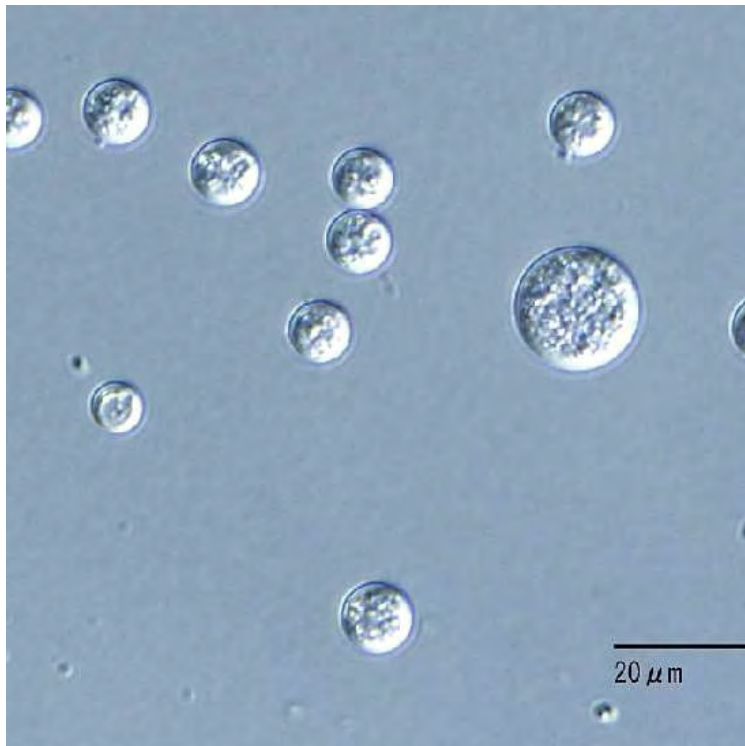
A Botryococcus braunii



- Green algae
- Hydrocarbon oil is produced photosynthesis.

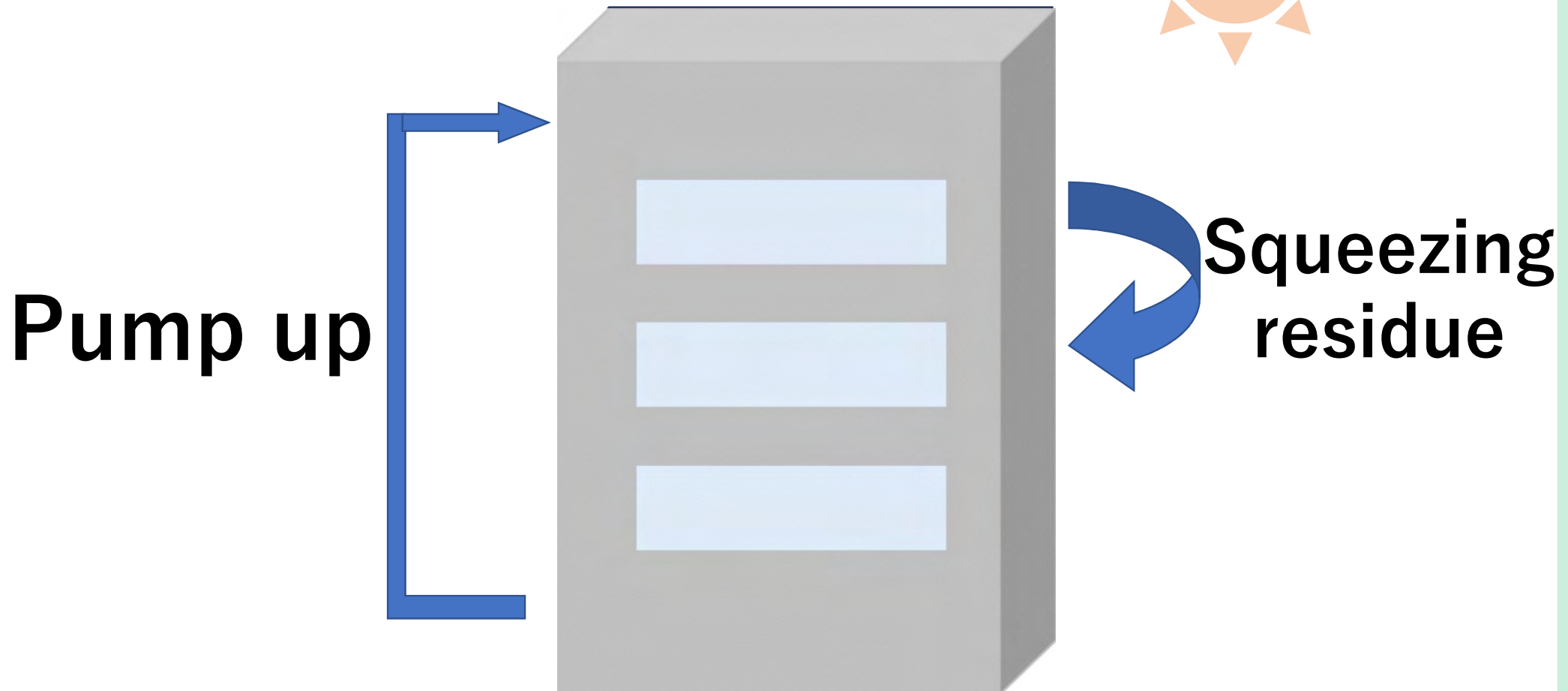
③ Algae that produces oil

B Aurantiochytrium



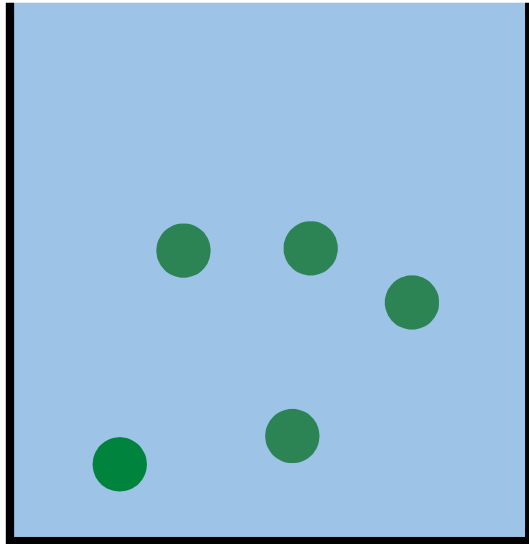
- Photosynthetic-free
- Grow organic matter as bait (sugar required)
- Produce oil

2. Structure of MOYUX Photosynthesis



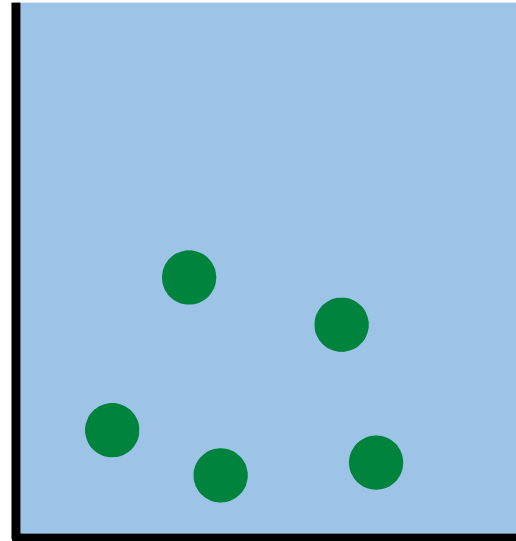
○ Oil extraction process

Filtration



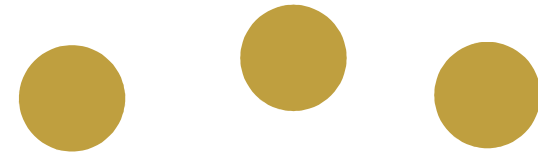
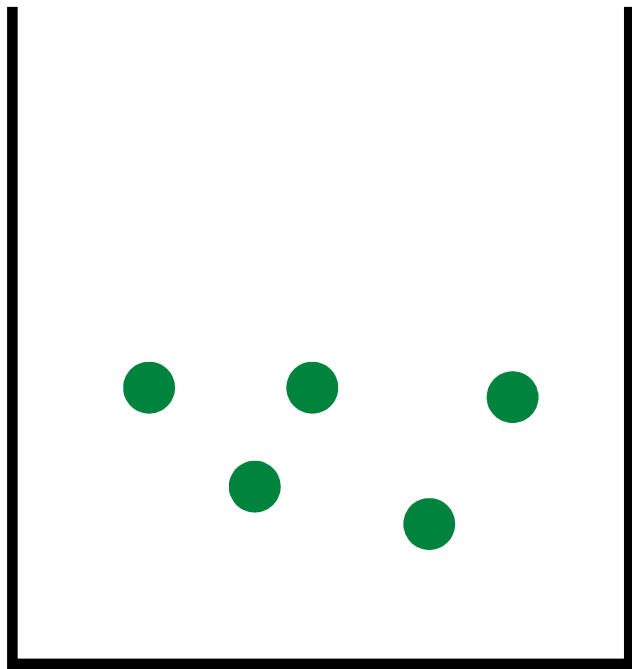
**The water goes
downstairs.**

remains



**To the oil
extraction
process.**

○ Oil extraction process



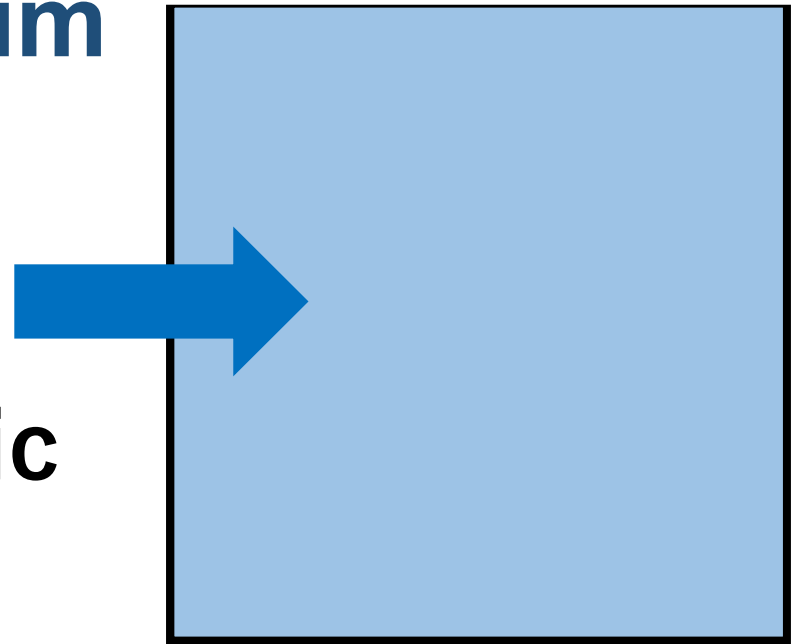
**You can get
squeezed dregs**

○ Oil extraction process

Squutheezed dregs into
the **Aurantiochytrium**
tank.



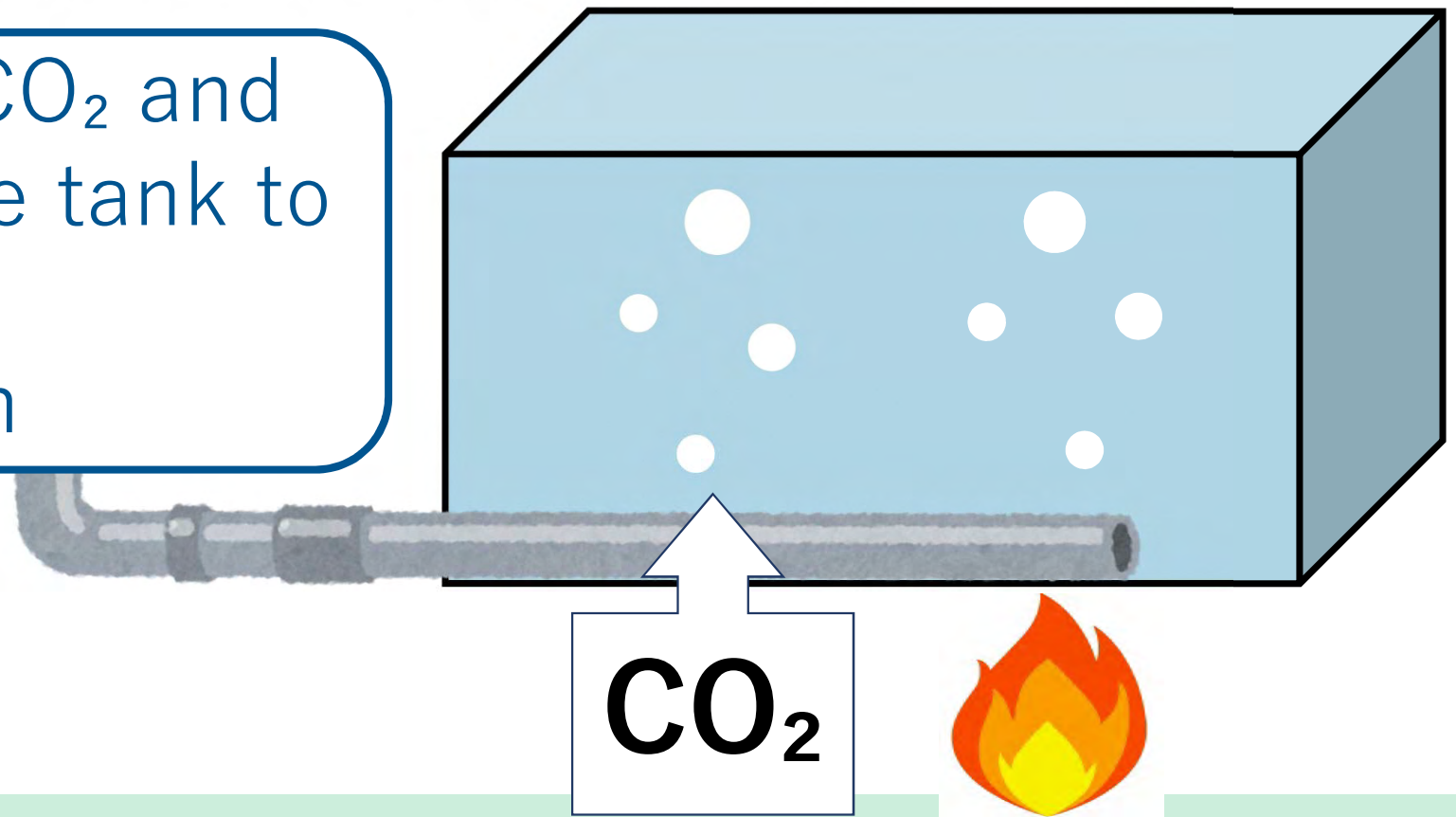
**You can get the organic
matter you need!**



3. Mechanism of absorption of CO₂

① Botryococcus tank

Transfer CO₂ and heat to the tank to facilitate absorption



② Simulation

A size of the Tank
about $25\text{m} \times 25\text{m} \times 1\text{m}$.



○ Oil production

① **Botryococcus** → **11.25t**

② **Auranticytorium** → **2500t**

https://www.naro.go.jp/laboratory/brain/contents/fukyu/episode/episode_list/137015.html

<http://www.hitachi-hri.com/research/keyword/k70.html>

○ Oil production

MOYUX

produces **2511 t** of oil in a
year.

○ Effect

If the oil is hydrocarbon $C_{10}H_{22}$,

With one **MOYUX**

$$2511 \times \frac{120}{142} \times \frac{1}{12} \times 44 = \mathbf{7672.5 \text{ t}}$$

Will result in absorbing that amount of CO_2 .

○ In Joetsu city

A power plant of the same size as the Joetsu Thermal Power Plant emits **28t** of **CO₂** per year.



One MOYUX
can cover



7672.5t

4

Advantages
of using
MOYUX

MERIT

① Capable of reducing CO₂

➔ **STOP** global warming



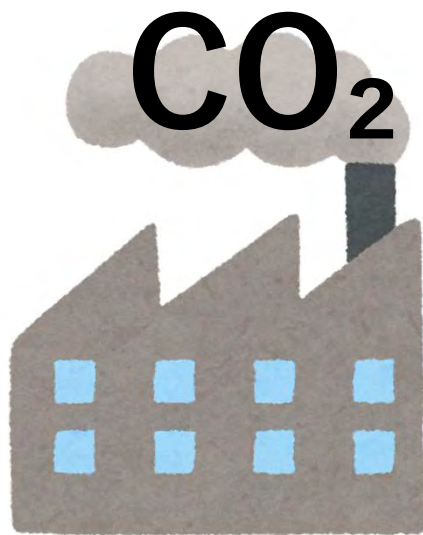
② Being Capable of producing biofuels

➔ **De-fossilized fuel**

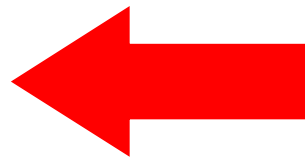


③ Carbon tax reduction

For company which runs factory



demand



Tax



④ SDGs solved



Propose plan 「MOYUX」 to an
oil company JAPEX

《Reaction》

- Innovative idea proper to high school student
- Why hasn't a device like MOYUX been popular so far?

Reference Material

- <https://xtech.nikkei.com/atcl/nxt/column/18/00933/031400031/>
- <https://www.sanrenhonbu.tsukuba.ac.jp/20160226seedz-2/>
- https://algae-consortium.jp/about_algaebiomass/system
- <http://standard-project.net>
- <https://pps-net.org/>
- <http://www.abes.tsukuba.ac.jp/clabes/watanabe-lab/02project/index.html>

Thank you for listening !!

