International Research Session for Next Generation with ESD,TWINCLE

2018.2.18

Poster Abstracts

Physics・Chemistry　Poster No.1-No.18

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Incorporated School Ichikawa Gakuen Ichikawa High School

Curry Noddle Soup Splatters

Grade 11　Takumi UMENOTO, Yuto TANIZAKI, Issei PRIBYL

Introduction

Back Ground

Curry noodle soup often splatters from your bowl and leaves stains on your fine shirts.

Then, we were strongly motivated to analyze the physical motion of noodles and figure out some means to prevent soup from spoiling your clothes.

Experiment Objective

Considering the physical laws, we looked for the best way to minimize the soup splatters.

Subject of Research ①

Observation A: Movements of the noodles when they were slurped were observed with a high-speed cameraes. The cameraes were arranged in both front and side of the bowl.

Observation B: we determined the time of how fast people could slurp noodles averagely, using a stop timer.

Results①

Observation A: Drops of the soup were mostly caused when ends of the noodles were about to enter the examiner's mouth. Furthermore, we clarified that the objects are swallowed into the mouth while making pendulum movements and a screw motions. To elucidate mechanisms in detail by which the mentioned movements, we conducted another three studies.

Observation B: The average speed was 46.63cm/s. It was even slower the normal walking speed. This figure was used in the result of Experiment B down below.

Subject of Research ②

Experiment A: we determined the time of a pendulum to shuttle 10 times and calculated its frequency, changing the length of the string each time.

Experiment B: we recreate the screw motion of noodles with a string and analyzed it

Results②

Experiment A: The chart below shows the results

Experiment B: It is found that the movement can be considered as a conical pendulum. It is due to a shape of noodle.

Considerations

Experiment A: To express the motion of pendulum in a formula, the following can be obtained.

$$T=2\pi\sqrt{(L/g)}$$

Theological values and actual measured values were roughly the same

There could be a possibility that the string moved not only on sides but diagonally as well, which is thought to have caused an error on values.

Experiment B: we applied the formula of conical pendulum

The following conclusions can be drawn from above. First, angular rate of the ends of noodles gets faster as one eats noodles. Second, velocity of the ends of noodles get slower as one eats noodles.

Conclusions

Theologically, soup splutters can be prevented from happening by holding edges of noodles, making it vertical to a bowl.

References

CBC GROUP GLOBAL GATEWAY　Interactive 2014
『iPhone6: How To Change In Shooting Speed Of High-Speed Camera』
PYSICS by Masakazu Kunitomo　January, 10th, 2017

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Analysis of the Contra-Rotating Propeller's Power Generation Efficiency

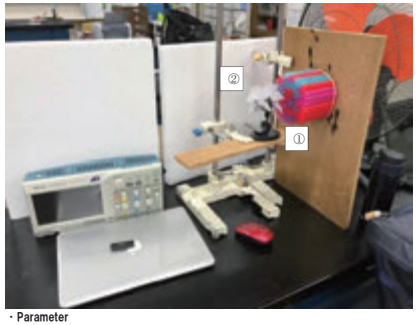
高校２年　倉井 健太朗

Introduction

- Purpose
  - to analyze how much power the Contra-Rotating propeller generates and consider the efficiency
- Background
  - the Counter-Rotating propeller is usually used for reciprocating engine such as propeller planes, but not for wind-power generation.
  - I started this research, based on the idea that there seems to be some useful ways in which the Counter-Rotating propeller can be applicative.

Objects & Methods

- Experiment Device

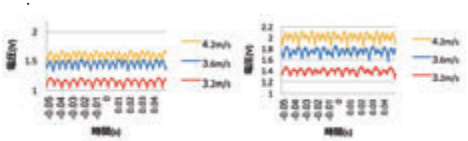


- Parameter
  - Change the power of wind produced by the fan.
    - Switch the power level of fan and measure the wind speed 40cm from the fan through the wind tunnel every 5 seconds for a minute, then calculate its average.
  - Change the type of counter-rotating propellers.
    - Set the ① and ② counter-rotating propellers, respectively 40cm and 43cm from the fan.
    - Set 2 types of counter-rotating propellers in order to confirm how the values of voltages change between counter-rotating propellers and not counter-rotating propellers.
      - ①…6 wing ②…6 wing
        Type B ①…6 wing ②…5 wing
- Hypothesis
  - No.1 produces more voltages than No.2 when the wind speed is certain speed, because the propellers of No.1 rotates in the same direction and the ② propeller of No.1 receives stronger wind spinned by the other propeller.

Results

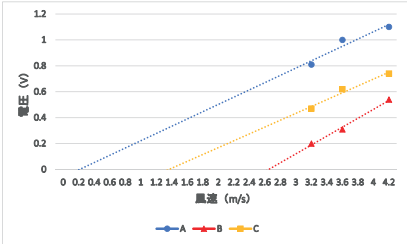
- Wind Speed

Low	Medium	High
3.2m/s	3.6m/s	4.2m/s



Consideration

- Increase Rates of Voltages
  - I made wave equations of each graphs, then compared their constants in order to calculate the increase rates of voltages.
- Formula : $y=\frac{A\sin x2\pi}{T}+a$
  - y : voltages(V)　A and α : constant　T : time(s)
- Increase Rates



- From the above graphs, ① of No.1 & No.2 and ② of No.2 have similar slope, but ② of No.2 has more gentle than them, so it can be said that there is a point that the value of ② of No.2 and ① of No.1 are the same.

Summary

- According to the results and consideration, my hypothesis that the counter-rotating propeller is more powerful when the wind speed is high and so that the not counter-rotating propeller is when the wind speed is low, seems to be correct.
- From these results, it can be said that the counter-rotating propeller is useful for the wind power generation in a place which the wind speed is strong.

Reference List

- 数研出版 「物理」
- 啓林館 「数学 III」
- http://www.avialogs.com/index.php/avialogs/how-it-works-contra-rotating-propellers.html

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Variation of frequency with liquid

High school grade 2　Yuki shimatani　Hajime kasai　Hiroki yanagawa

Introduction

Purpose Studying "Glass harp" it is one of the instruments, we came up with changing the amount of water in the glass into the oil which is lighter than water.

Background When we studied physics units of wave in second grade high school, we wonder how we made the difference of frequency.

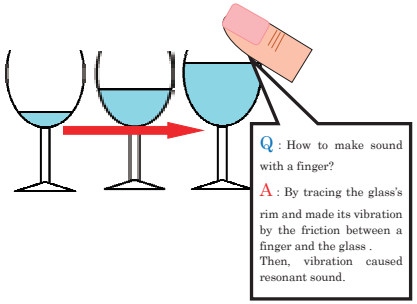
Subject of research and procedure

Specific gravity
Water: 1.019g/ml
Oil : 0.787g/ml

① We added water into the glass gradually, and investigated the organized sound 's frequency by smartphone again and again.

② We tried doing the same procedure by using oil.

③ We compared the two research data.



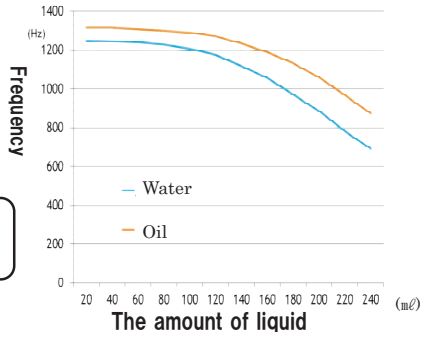
Result

The more water there was, the lower frequency the sound became.

Therefore, we were able to hear the lower sound.

The same phenomenon occurred to oil.

Graph1



This graph 1 shows that the difference of the frequency when we changed the amount of water.

Obviously, it is higher frequency generated sound have when using oil than water.

Consideration

Oil is lighter and its resonant sound's frequency higher than water, so the lighter substance there are, the more frequency generated sound become.

In other words, light liquid is easy to vibrate, so that the sound is high

Summary

We tried investigating the difference of resonant sound.

When we used oil instead of water, the occurred sound was lower frequency than water.

References

A high school physics textbook with Suken Corporation in 2013.

Application of a cellphone, iAnalyzer lite

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Individual Differences In Illusion Interpretation

2-3 Yuki Asai　Rin Sugawara
2-6 Towa Muraoka

Introduction

We wanted to know whether or not there are individual differences of the way people feel because of optical illusions, so we researched.

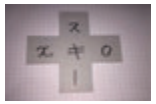
First Research

Objective:
Researching individual differences in illusion interpretation.

Expectation:
Interpretation of illusion is different by position (teachers or students), gender (men or women) and the subject people major in (linguistics or sciences).

Method:

678 and Cherry Blossom



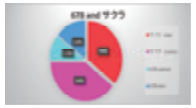
Sky and x≠0

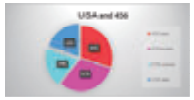
456 and USA

Chinese Character and Katakana (Yachiyo)

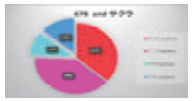
We showed these cards one by one and asked 79 people "which word did you read at first?"

Result:
Comparison by gender

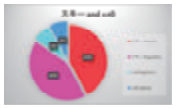




Comparison by position



Comparison by major



Consideration

Whatever we classified, there were little deviation of recognition.
Those who surveyed read the word which is easy to read and familiar with them.
People have the way they apt to read.

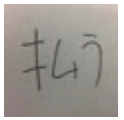
Second Research

Improvement:
We made a card which does not depend on the way people tend to read vertically or horizontally.

Objective:
Researching whether or not the way to read changes by information which was given to subjects.

Expectation:
The more information subjects get, the easier they can read the word.

Method:
1.We showed high school students one of four pictures.(①Takuya Kimura ②Shingo Katori ③Money ④Payment)



2. We asked them "What does this word mean?"

Result:

Consideration

Conclusion

Measurement of pH by artificial salmon roe

Chosei High School Akiba Miki Mitsuhashi Mei

1 Motive

There are some tools for pH measurement by changing colors.
But most of them are made of paper.

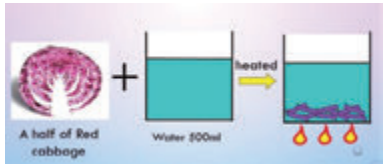
We wish there were a tool
like a small capsule.
It could be observed easily and pretty.
One day, we knew about artificial salmon roe.
And found it can be made easily and safely.

2 Purpose

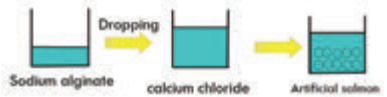
Make **a new tool for pH measurement** by artificial salmon roe

3 Material and Method

▸How to extract pigment

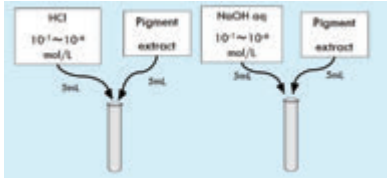


▸How to make artificial salmon roe

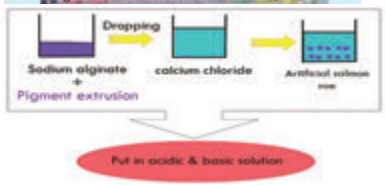


4 Result

▸ Turning color of extract under several pH condition



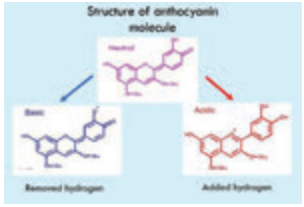
▸Put the pigment in to salmon roe



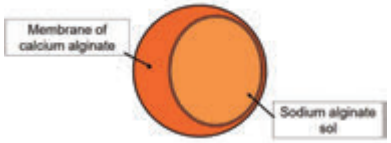
▸Pigment in salmon roe under several pH condition

5 Consideration

▸ The structure of pigment ; anthocyanin



▸ The structure artificial salmon roe



The Most Excellent Solution for Chemical Traffic Signal Reaction

Chosei High School Rena Itakura Daichi Kobayashi Asami Yanagi

1 What is Chemical Traffic Signal Reaction?

The solution turn colors one after another reversibly.
But cannot be repeated so many times.

2 Purpose

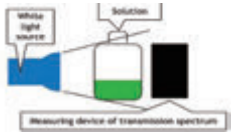
Research the detail of turning colors and Make an excellent solution which can be used by 10 times or more

3 Material and Method

▸

Standard reaction solution	
Purified water	50mL
Indigo carmine solution 1.0%	1.0mL
Sodium hydroxide	1.0g
Glucose	0.60g

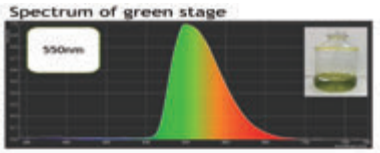
▸Measurement

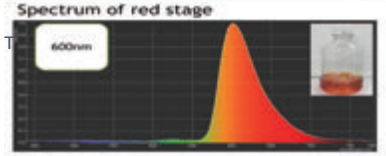


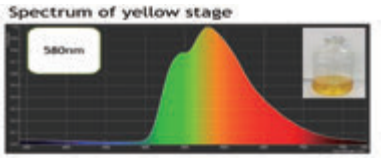
Measured the wavelengthof transmitted light in each stage

4 Result

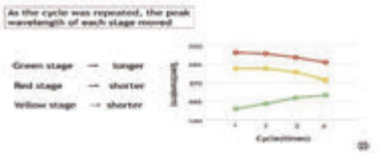
▸Detail of turning color



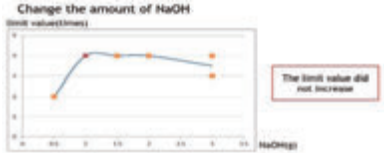


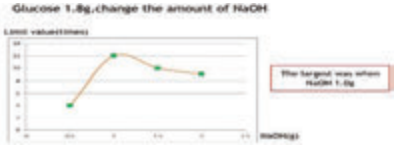


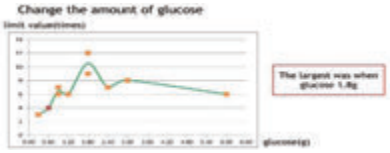
▸Change of wavelength



▸Effect of changing reactant of solution







5 Consideration

▸Mechanism of turning color is related in the structure of Indigo carmine and its oxidation or deoxidation.

▸Glucose control the deoxidation▸

▸The most excellent solution is ・・・

Purified water 50mL , NaOH 1.0g,

The hardness of gluten changed by adding salt

Chosei High School　Takabatake Haru

1 Motive and purpose

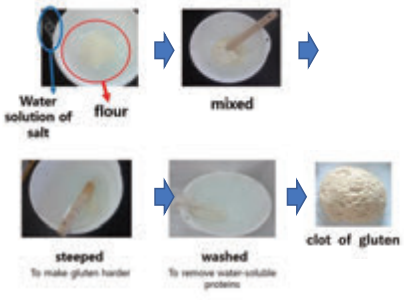
It is well known that ***udon*** is made from flour, water and salt. I like ***udon*** because it has good elasticity. This elasticity comes from gluten which is a protein contained in flour. It is said that, the more salt is added, the more the elasticity increases.

Purpose;

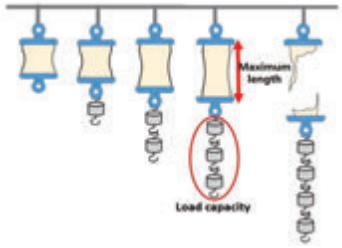
Research the relationship between the hardness of gluten and the salt added.

2 Material and Method

▸How to extract gluten



▸How to measure the hardness of gluten



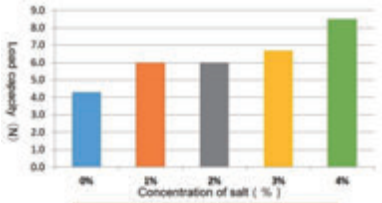
The clot was divided into pieces and hung.

Two criteria for judging the hardness of gluten.

One is the load capacity which is the heaviest weight the gluten piece could hold. The second is the maximum length of the gluten piece.

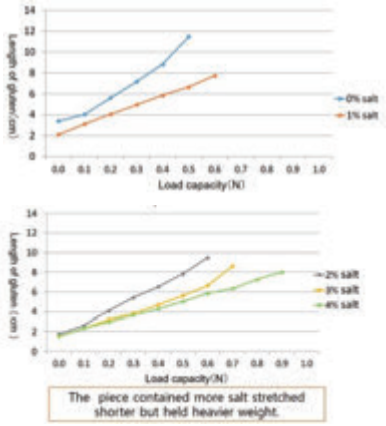
3 Result

▸ Load capacity of gluten



The more salt added,the heavier weight gluten could hold

▸ Stretch gluten piece



The piece contained more salt stretched shorter but held heavier weight.

4 Consideration

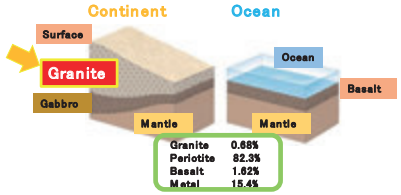
Gluten is made with two proteins. Protein molecules have some type of charge, so repel each other. If salt is given, it would be separated into $Na^{+}$and Cl^{-}. The ion instantly unite the charged part of molecule, and weaken the charge. That could make molecules come close to each other. They combine one after another, and finally gluten become harder. In this process the ion from NaCl should make the distance among molecules shorter by weakening the charge. In the end the stretch of gluten become shorter.

Exploring the Cause of Water Stain

Chosei High School 11th
Miyuka Katsurayama
Kawamoto Izumi

Ⅰ. Introduction

Stains occur on the tombstone as time passed and it does not return to the original when it dried. → There might be some other cause.



Granite is the plutonic rock and very easy to weather. It is included by total volume of the earth. But most of the crust is formed by the granite. ⇒ Easy to collect.

Ⅱ. Purpose of Research

To reproduce water stain in the laboratory

Ⅲ. Experimental Method

[1] How to select rocks

・1～3 are easy to form water stain. 4～5 are difficult.

＊Choose different appearances, production areas.

[2] Measurement of the color index

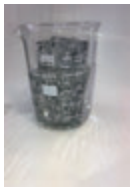
・Taking a picture of the rock surface.

・Count the number of colored minerals to find the proportion.

[3] Soak rocks in water

① Number rocks 1 to 5. Pour rain water and pure water.
② 2 weeks later, take out all rocks from water.
③ Dry for 2 days and check.
④ If there is water stain, dry for a further week.

*If there was no change, repeat ① to ④.



Ⅳ. Result

・81 days later, confirm water stain to [1] in rain water.
・100 days later, confirm water stain to [1] in pure water.
・There were no change the mass of all rocks.

＊ Ask 10 people to check.

Rocks					
Country	Japan	Korea	China	India	China
Color index	10.07	6.23	5.55	8.16	2.17
Water Stain	○	○	○	△	△
Result	○	×	×	×	×
Rainwater(g	166.4	117.7	130.9	143.8	147.8
Days(Rain)	100	×	×	×	×
Purewater(g	158.1	123.1	131.4	131	127.8
Days (Pure)	81	×	×	×	×

Ⅴ. Consideration

・No change in the mass of 1. →No moisture remains in the rock.
・Water is not the direct cause.
→Calcium carbonate.

Ⅵ. Future Study

・Focus on Calcium carbonate.
Make an aqueous solution decide concentration and period.
・Make flakes with the rocks used in the experiment.
Observe with a polarizing microscope.

→Investigate concrete minerals contained in the rock.

The effect of applying varnish on wood

Chiba Higashi High School
Suzuki Aino　Endo Haruna

<Outline> Varnish is often used to protect furniture and so on. We wanted to study the effects of varnish on wood. In these experiments, we found that oil-based varnish has an effect that hardens the surface of the wood.

To harden varnish

・Urethane[Oil-based varnish component]:Resin reacts by mixing the catalyst and curing agent, cured with polymerization.

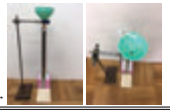
・Acryl[Water-based varnish component]:Evaporation of the solvent in the coating film, the coating is cured.

<Experimental method>

Measuring Method

1, Set the steel ball on and removed the partition.
2, Recorded the drop in slow motion, measured the height of the steel ball's bounce.
3, Repeat 1 and 2 10 times and take the average of the six most central scores.

Left : side view
Right : from above
Experimental device→



Method of Processing the wood

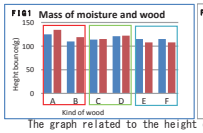
1, Painted the varnish.
2, Dried the wood over 16 hours.
3, Put into a certain environment and measured of change the weight.
*Used wood: white wood [19mm thick]

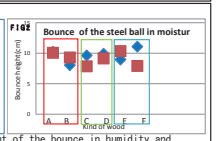
<Experiment 1>Researched about the effect of moisture on the wood

Measuring method

1, Prepared wood A, B, C, D, E, F
2, Measured the height of the steel ball's bounce on woods A, B, C, D, E, F.
3, A, B : Put in a high humidity environment
C, D : Put in a room　E, F : Put in a dry environment
4, Measured the bounce height of the steel ball on A, B, C, D, E, F. again one week later.

Result





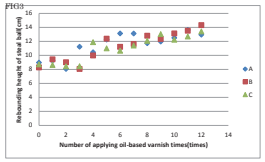
The graph related to the height of the bounce in humidity and the steel ball was not significant.

<Experiment 2-1> The relationship between applying oil-based varnish and the hardness of wood.

Experiment

1, We prepared three pieces of wood A, B and C.
2, We measured the bounce height of the steel ball on woods A, B and C.
3, We applied oil-based varnish to wood A, B and C. And left them more than 16 hours.
4, We measured the height A, B and C.

Result



It was found that when the number of coats of varnish was increased,

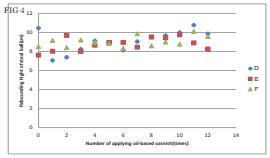
Consideration : We considered that the hardening of oil-based varnish made the surface of wood harder.

<Experiment 2-2> The relationship between applying water-based varnish and the hardness of wood.

Experiment

1, We prepared three pieces of woods A, B and C.
2, We measured the rebounding height of the steal ball on wood A, B and C.
3, We applied water-based varnish to woods A, B and C. And left them for more than 16 hours.
4, We measured the rebounding height of the steel ball on wood A, B and C.

Result

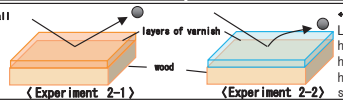


Even if the number of times to apply varnish is increased.

Consideration : We considered that the hardening of acryl in water-based varnish had little effect on the hardening of the surface of the wood.

<Experiment 2-1> image→

Steel ball rebounded higher because the hardening of the urethane in oil-based varnish made the surface of the wood harder.



<Experiment 2-1>　<Experiment 2-2>

←<Experiment 2-2> image

Little change was seen in the rebounding height of the steel ball because the hardening of acryl in water-based varnish had little effect on the hardening of the surface of wood.

<Experiment 3> The relationship between the hardness of wood and the time since the varnish was applied.

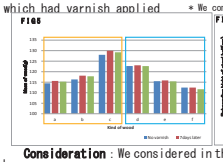
Experiment

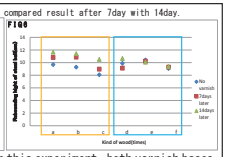
1, We prepared six pieces of wood a, b, c, d, e and f.
2, We applied oil-based varnish to wood a, b and c and water-based varnish to wood's d, e and f. After a week, We measured the rebounding height of the steel ball on the woods again.
3, We measured then again a second week.

Result

From FIG 5, both the mass of oil-based and water-based varnish decreased as time went by. From FIG 6, for oil-based varnish, the rebounding height of the steal ball became higher as time went by.

＊We compared result after 7day with 14day.





Consideration : We considered in this experiment, both varnish bases were caused by the evaporation of the varnish's solvent, and the polymerization of urethane in oil-based varnish made the surface of the wood harder.

<Summary>

・We found that oil-based varnish made the surface of the wood harder, and promoted urethane polymerization little by little. And water-based varnish didn't make the surface of the wood change.

<Future Studies>

・We will varnish into element or property and research it, and find differences between synthetic and natural.

<Reference>

・Basic knowledge of the paint　有限会社本多塗装店公式サイト【h-tosouten.com/work/type】

Secret of black ink pen　～Black ink pen is colorful～

Chiba-higashi high school
Tomoki Ono　Kouhei Nakamura

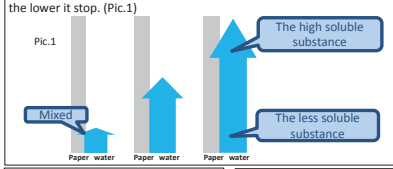
<Motive>

We learned the Paper Chromatography in the first chemical class in the high school. At that class, we were greatly surprised that a water-based ink pen separated into different color components, and we got to be interested in the Paper Chromatography. Latter, we found out that two certain pens varied in some color components in spite of same color ink pens. Black ink pen has especially the interesting point, that each pen has some different color components when there is a difference in its manufacturer or kind of ink. So we studied this.

<The principle of the Paper Chromatography (using water as developing solvent)>

Chromatography is a way of separating mixed substances of chemicals, using the difference of each absorptive power. The more soluble the substance is, the higher it travels up, and the less soluble the substance is, the lower it stop. (Pic.1)

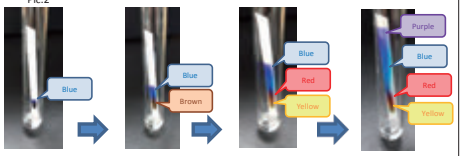
Pic.1



<One example>

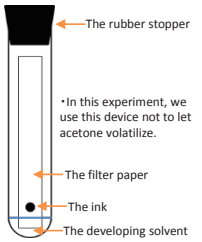
In this instance, calligraphy pen,「二本立てかぶら(*nihondate-kabura*)」with the ratio of 1 to 4 between water and acetone as developing solvent. (Pic.2)

Pic.2



<The device we used>

Pic.3

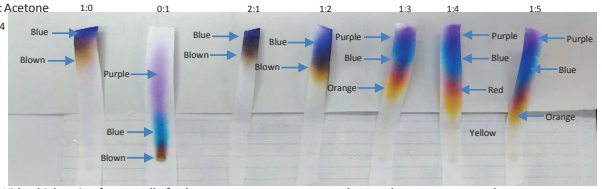


<Experiment 1>

-Difference of developing by changing the ratio of water and acetone-

※We used *nihondate-kabura mainly this time.*

Pic.4



Result: With a high ratio of water, all of color components rose up top whereas there were some color components which didn't rise top with a low ratio of water. (pic.4)

Consideration: The ratio of 1 to 4 between water and acetone is suitable so that we could see some difference color components in the polarity. So the ratio of 1 to 4 is the best for developing.

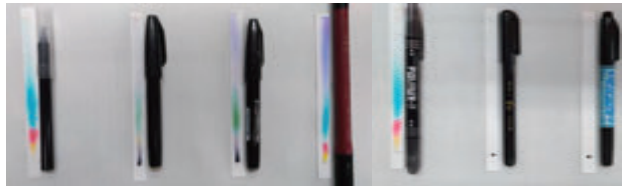
<Experiment 2>

-Different pens vary in the extent of developing-

Result: One pen contained green, and another pen contained yellow. In addition, though a pen has water-based ink, it didn't develop and separate into any color components.

Consideration: The ratio of 1to 4 between water and acetone were proper for *nihondate-kabura*. But some pens varied in some color components, and another didn't develop. So, that is each different pen needs developing solvent of each different ratio.

Pic.5



Manufacturer's name / Trade name	Can Do カラーペン Color pen	Pentel サインペン Felt pen	Pentel 筆touchサインペン *Fude*-touch felt pen	呉竹 筆ペン二本立てかぶら Calligraphy pen *nihondate-kabura*	三菱鉛筆 ピュアカラーF Pure color F	プラチナ万年筆 Calligraphy pen「so-hitsu」	ZEBRA 水拭きで消せるマッキー Mackie of disappear with water
kind of ink	Water-based ink	Water-based ink	Water-based ink	*Water-based ink*	Water-based ink	Pigment carbon black ink	Water-based ink

<Summary and Future prospects>

Although generally, same black ink could be seen, with Paper Chromatography, we could find out there were differences of pens in color components. As the particles of pigment carbon black ink doesn't dissolve in it, or developing solvent, we couldn't make the pigment carbon black ink pen develop. And we have studied the ratio of developing solvent for only one pen. So we'll study the other suitable ratio of developing solvent.

<Make Asagao>

We have learned paper chromatography much. So, we make beautiful circle like Asagao using this technology.

Blank for *Asagao*

<Reference> 廣川書店　薄層クロマトグラフィー　橋本庸平

Extracting Energy From Food Loss

Tokyo Metropolitan Tama High School of Science and Technology
Nozomi Ookubo　Mika Iimori

Abstract

This research is about effectively making use of food loss by extracting energy. Energy can be used in fuel cells. This is very eco-friendly energy.

Introduction

There are 6,320,000tons of food loss in Japan every year. Measures to reduce food loss have already been taken. However nobody has made effective use of food loss. If food loss can be extracted energy, it is more effective. It is assumed that if energy can be extracted from food, energy can be used in fuel cells. The target of this research is to extract much energy from food loss.

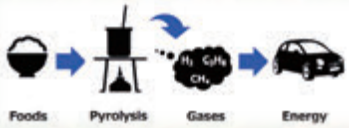


Fig.1 Image of research

Experiment

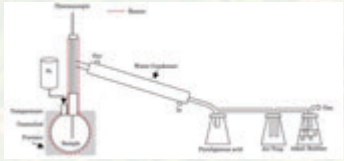


Fig.2 Pyrolysis apparatus

1. We set up the experimental apparatuses as shown in Fig.2.
2. The chamber was filled with Nitrogen for 60min.
3. The reactor temperature was raised to 450℃ at a rate of 5℃ /min.
4. Gases generated were collected in a gas pack after passing through an alkaline aqueous solution.

Table.1 Experimental Condition

	Experimental Condition
Ⅰ	Dried Rice
Ⅱ	Dried Rice + Molecular Sieves 3A (1:1)
Ⅲ	Dried Rice + Molecular Sieves 13X (1:1)
Ⅳ	Dried Rice + Molecular Sieves 3A Powder(1:1)
Ⅴ	Dried Rice + Molecular Sieves 13X Powder(1:1)
Ⅵ	Dried Rice + Sea Sand (1:1)

Result and Discussion

A. About generated gases　B. About pyroligneous acid

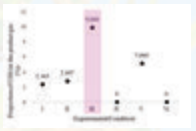


Fig.3 Proportion of CH_4 in the product gas in L for each condition
We analyzed by SHIMAZU GC2014FID

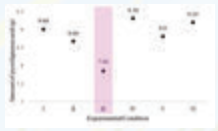


Fig.4 Amount of pyroligneous acid for each condition

◆As the amount of CH_4 increases, the amount of pyroligneous acid decreases. It is because decomposed dried rice has been produced as a pyroligneous acid.
◆Compared to the sample before experiment, it can be inferred that charcoal could be extracted by pyrolysis because the amount of charcoal in the sample after pyrolysis is low.
◆It is suggested that Molecular Sieves 13X could promote the reaction.

Conclusion

◆Dried rice was extracted as gases and pyroligneous acid by pyrolysis, and the mass of the rice decreased by about one third.
◆Proportion of CH_4 in the product gas has increased in 3A, 13X, and 13XPowder.
◆By adding Molecular Sieves 13X, the most CH_4 was able to be extract from rice with less energy.

Future Process

We will find the best type of Molecular Sieves as an additive and identify the best sample to additive ratio. We will consider making use of samples after experiment.

Fig.5 Image of research in the future

Reference

[1]Ministry of Agriculture, Forestry and Fisheries of Japan
[2]World Food Programme
[3]Government Public Relations online
[4]Ministry of the Environment

Luminol reaction using amino acids ～with heart of two kinds～

Chiba Municipal Chiba High School　science and mathematics course　1st-year students　Sugawara kotaro　Yuzawa aoi　Wada leon

Introduction

We were interested in chemiluminescence when we started to join the club activity. Seniors of the club activity researched luminol reaction so we decided to research it. This research, we used Cu and amino acids as complex.

Luminol reaction happens like following figure (Fig.1).

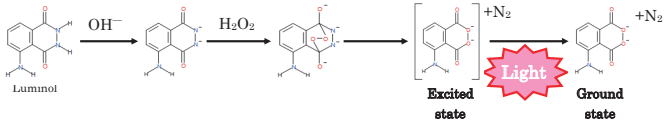


Fig.1 Luminol reaction mechanism

Fig.2 Luminol reaction

Ⅰ. Method

Material : Luminol, NaOH solution(2.5mol/L), H_2O_2 solution(3.0%), $CuSO_4$ solution(0.30mol/L), L-amino acids
Petri dish, Black box, Illuminometer

Method : (1) We mix luminol 0.010g and NaOH solution 0.30mL into H_2O 20mL. We name it "Luminol solution".
(2) We mix NaOH solution 1.0mL and amino acids 3.0×10^{-4}mol or 6.0×10^{-4}mol into H_2O 1.5mL.
After that, we add $CuSO_4$ solution 0.5mL to it. Then, we pick up appearing $Cu(OH)_2$. We named it "Complex solution".
(3) We mix "Luminol solution" 5.0mL and H_2O_2 1.0mL into a petri dish.
(4) We put this petri dish in black box, and we mix "Complex solution" 3.0mL into it(Fig.3).
Then, we record "Max illuminance" 7 times by using an illuminometer, and average them.

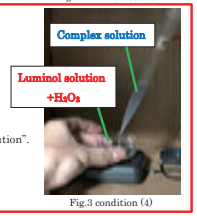


Fig.3 condition (4)

Ⅱ. Experiment　"Optimum amount" of amino acids

Hypothesis

We thought that amino acids which we used 6.0×10^{-4}mol is the best illuminance because a coordination number of Cu is 4(Fig.4). But, some papers said that a coordination number of Cu is 2 when we used amino acids. So, amino acids 3.0×10^{-4}mol is the best(Fig.5). Therefore, we researched to use amino acids 6.0×10^{-4}mol and 3.0×10^{-4}mol.

Result

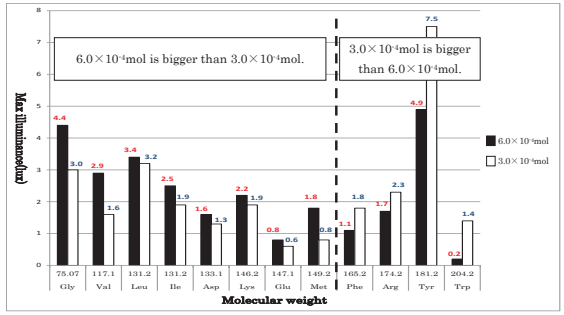


Fig.6 Resulut

We used less than 150 of molecular weight of amino acids, 6.0×10^{-4}mol is bigger than 3.0×10^{-4}mol.
We used more than 165 of molecular weight of amino acids, 3.0×10^{-4}mol is bigger than 6.0×10^{-4}mol.

Discussion

Less than 150 of molecular weight makes a lot of $[Cu(an\ amino\ acid)_4]$(Fig.4).
More than 165 of molecular weight makes a lot of $[Cu(an\ amino\ acid)_2]$(Fig.5).

$CuSO_4$ solution 0.50mL contains Cu^{2+} 1.5×10^{-4}mol.
A coordination number of Cu is 4.
⇒Amino acids 6.0×10^{-4}mol.

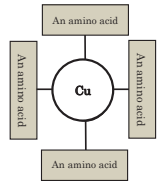


Fig.4 Amino acids 6.0×10^{-4}mol model

$CuSO_4$ solution 0.50mL contains Cu^{2+} 1.5×10^{-4}mol.
A coordination number of Cu is 2.
⇒Amino acids 3.0×10^{-4}mol.

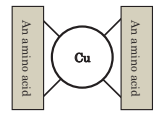


Fig.5 Amino acids 3.0×10^{-4}mol model

Ⅲ. Perspective

①We are using two amino acids.
②We want to use D-amino acids.
③We want to use polymer.

Ⅳ. Reference

・グリシナト銅(Ⅱ)の合成　http://www.sci.keio.ac.jp/gp/2E73001A/61D2E667/BBBB7DF5.pdf
・アミノ酸の銅錯体をつくる　http://ci.nii.ac.jp/els/contents110001825025.pdf?id=ART0001981587

千葉大学次世代才能ステップアッププログラム第 3 回国際研究発表会@千葉大学西千葉キャンパス 20180218

Consideration of Radioactive Material Removal Method by Volcanic Ash Using Simulated Radioactive Material

Tokyo Metropolitan High School of Science and Technology
YOSHIKA Kawana, IZUMI Akiba, NATSUME Goto

Abstract

In the Great East Japan Earthquake that occurred in Japan in 2011, it was hit by a tsunami that we never experienced. As a result, at the Fukushima Daiichi Nuclear Power Station in Fukushima Prefecture, a radiation accident occurred due to the damage of the tsunami. A large amount of contaminated water is produced by contamination of a large amount of radioactive substances in underground water flowing simultaneously. In this study, we noticed that silicon was adsorbed by cesium in previous studies. Since the main component of volcanic ash is silicon, we attempted to adsorb cesium using ash waste ash. In this research, an experiment was conducted to prepare a glass tube filled with volcanic ash and flow cesium. The result reports that 99.8% of removal succeeded.

Causes of Research

In the Great East Japan Earthquake that occurred in March 2011, it was hit by a tsunami that we have never experienced before. In Fukushima prefecture nuclear power plant was damaged by the tsunami, scattering radioactive material became a problem (Fig.1).

Fig.1 Great East Japan Earthquake

However, there are things that are a problem at the same time as measures against accidents at nuclear power plants. **That is that groundwater flows into the nuclear reactor building by about 300 tons a day, becoming new polluted water containing highly concentrated radioactive material.** When I was aware of this situation and thought that I could do something, I learned that the total amount of ash fall in Kagoshima prefecture was 4.9 million tons in 2015, and countermeasures such as damage to agricultural crops were urgent. Using this volcanic ash in Kagoshima prefecture, I thought that after the Great East Japan Earthquake, I thought I could handle contaminated water that is interfering with the processing of nuclear power plants.

Research Method

We examined how cesium and strontium contained in contaminated water can be removed efficiently. As contaminated water is generated by the flow of groundwater, we attempted a method to consider the flow of water and adsorb it and remove radioactive substances (Fig.3).

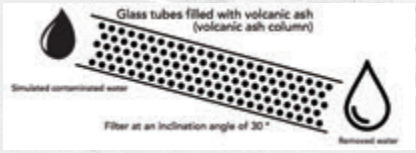


Fig. 3 Experimental apparatus diagram

Experimental Method

As a sample, volcanic ash (Tarumizu City, Kagoshima prefecture), cesium nitrate (Wako Pure Chemical Industries), and strontium nitrate (pure chemical industry) are used. A solution prepared with 0.001 mol / L cesium nitrate aqueous solution and 0.001 mol / L nitric acid strontium aqueous solution as simulated contaminated water is used as a standard solution. In this study, only the result of cesium nitrate is reported.

Experiment Procedure

STEP1 Feed 100 mL of simulated sample into the volcanic ash column.
STEP2 Collect the filtered simulated sample.
STEP3 Flow again recovered simulated sample to a new volcanic ash column.
STEP4 Repeat the operation from STEP 1 to STEP 4 three times.
STEP5 The filtered solution is quantitatively analyzed by atomic absorption spectrometry.

Treat Contaminated Water with Volcanic Ash

In the research of Kyoto Prefecture University, it is reported that silicon has the property of adsorbing cesium. Since the main component of volcanic ash is silicon, it was conceived that volcanic ash would adsorb radioactive materials and be useful for contaminated water treatment. Cesium and strontium are contained in contaminated water produced at the Fukushima Daiichi Nuclear Power Station, but cesium can be treated in the septic tank, but various treatments have been made with the treatment of strontium as a subject. Currently, it is being processed by multiple purification facilities such as pollen allergy removal equipment (ALPS) for the purpose of adsorption. Therefore, it is relatively easy to obtain and tried contaminated water treatment using volcanic ash, which is waste in Kagoshima. As a sample, strontium nitrate and cesium nitrate, which are nonradioactive substances, were subjected to adsorption tests as simulated radioactive substances (Fig.2).

Fig. 2 Image of research

Results and Discussion

A simulated sample was passed through a volcanic ash column, and a simulated sample that passed was quantitatively analyzed using an atomic absorption spectrometer (SHIMADZU AA-6800) and a hollow cathode lamp (Cs) (HAMAMATSU PHOTONICS L-233-55 NB). Then, it was confirmed whether the concentrations of cesium and strontium in the sample decreased (Fig. 4). In addition, pH change before and after the experiment was also tracked (Fig. 5).

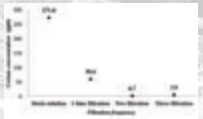


Fig.4 Changes in cesium concentration

Fig.5 Observation of pH

As shown in Fig. 4, the cesium concentration could be decreased by 98.8%. It can be inferred that this is due to the adsorption effect on the volcanic ash. **Also, since the pH of the solution was kept almost constant, it is considered that there is no influence by pH.**

Conclusion

In this study, we focused on the fact that silicon contained in volcanic ash adsorbs cesium. **As a result, 98.8% of the cesium concentration could be adsorbed.** This suggested that volcanic ash can contribute to **the treatment of contaminated water discharged from Fukushima Daiichi Nuclear Power ...**

Acknowledgments

In starting this research, volcanic ash from Sakurajima was provided free of charge from Tarumizu City Hall in Kagoshima Prefecture.

千葉大学次世代才能ステップアッププログラム第 3 回国際研究発表会@千葉大学西千葉キャンパス 20180218

GASIFICATION OF FOOD WASTE BY PYROLYSIS

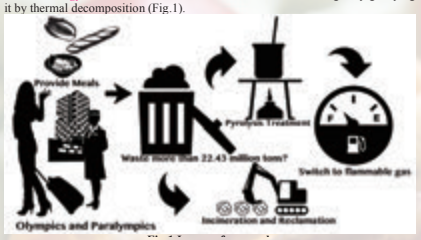
Tokyo Metropolitan High School of Science and Technology
RINA Ooguchi, MARI Sawasaki, YUKA Nagasawa

Abstract

The amount of food waste discharged by Japan is 22 million tons per year. Fifteen million meals will be offered at the Tokyo Olympic Games and the Paralympics Games scheduled to be held in 2020. However, at the London Olympic Games, 22.43 million tons of food waste is discharged during the period. As in the London Olympics, it is expected that a large amount of food waste will be discharged at the Tokyo Olympics and Paralympics. From this fact, before considering incineration, I thought that heat and energy can be used as food waste as unused energy and tried to convert food waste into combustible gas by gasifying it by thermal decomposition. We tried to convert to flammable gas by thermal decomposition at low temperature by adding pyrolysis by adding additives to the simulated food waste but it was possible to suggest that the amount of methane increased as the generated combustible gas. We also report that we were able to demonstrate the possibility of energy conversion of food waste.

Causes of Research

The amount of food waste discharged by Japan is **22 million tons per year**. Food waste that was originally able to be eaten is **6.32 million tons per year**. These 6.3 million tons is equivalent to twice as much as 3.2 million tons of food aid from the world. In addition, some of the food waste is used for fertilizer etc., but 90% is incinerated. Fifteen million meals will be offered at the Tokyo Olympic Games and the Paralympic Games scheduled to be held in 2020. However, at the **London Olympics 22.43 million tons of food waste was discharged during the period**. Like the London Olympic Games, it is expected that large quantities of food waste will be discharged at the Tokyo Olympic Games and the Paralympic Games. From this fact, before thinking about incineration, **I thought that food waste could be used as heat and energy with unused energy**. We tried to convert food waste into combustible gas by gasifying it by thermal decomposition (Fig.1).



Research Method

Pyrolysis is generally carried out at 600 to 800 degrees, but it was carried out at low temperature because it is highly used waste. In order to perform thermal decomposition at low temperature, we tried to add more gas by adding additives. Consider decomposing bonds at low temperature by adding additives.

Possible pyrolysis reaction equation

$$(C_6H_{12}O_6)_n \rightarrow nC + nH_2O + nCO_2 + nCH_4 + nH_2 + \text{...others}$$

Fig.2 Image of pyrolysis

A. Review of additives

Molecular sieves were used as additives. Molecular sieves used as column-packing materials are porous and are used as adsorbents. Since it is an artificial zeolite, a catalytic effect has been reported.

B. Review of molecular sieves

The pH of the molecular sieve 3A, 4A, 5A, and 13X was measured according to JIS standard dissolution test.

Table 1 Molecular Sieves pH

3A	4A	5A	13X
10.72	11.26	8.90	10.88

* According to the dissolution test of JIS standard, sample was mixed with distilled water = 3: 100, shaken at 200 rpm for 2 hours, and the pH was measured with a pH meter (HORIBA pH METER D-51). Also, taking into consideration the influence on the thermal decomposition depending on the size of the particle size, after grinding, it was shaken by an automatic vibrator, and the particle size was adjusted to 150 μm to obtain powder. In this study, we decided to use Molecular Sieves 4A whose solution pH was the maximum value as an additive.

Experimental Method

A. Experimental materials

In this study, as a simulated food waste, a cooked rice (Koshihikari from Miyagi Prefecture) was artificially dried at 110 ° C for 24 hours. Molecular Sieves 4 A (1/16 Wako Pure Chemical Industries) was used as an additive. Experimental conditions of this study are shown in Table 2.

Table 2 Experimental conditions

Conditions	Sample	Addition Rate
I	Rice	—
II	Rice＋Molecular sieve 4A（Grain）	1：1
III	Rice＋Molecular sieve 4A（Grain）	2：1
IV	Rice＋Molecular sieve 4A（Powder）	1：1
V	Rice＋Molecular sieve 4A（Powder）	2：1

B. Experimental method

The experimental apparatus used in this study is shown in Fig. 3. 20 g of a sample was placed in a glass reactor, and in order to remove oxygen from the reactor in 60 minutes, nitrogen substitution was carried out. When additives were used, 20 g of additives were mixed into the sample and placed in the reactor as a mixture. Nitrogen gas was flowed at a flow rate of 50 mL / min. After purging with nitrogen, the nitrogen gas was stopped and thermal decomposition experiment was carried out. The sample part of the glass reactor was measured as the decomposition temperature.

Fig.3 Experimental apparatus

With a thermal decomposition temperature of 450 ° C., it was raised to 450 ° C. at 5 ° C./min. Gas that passed through the cooling pipe was condensed to produce oil and was collected in a recovery container. Gas was collected in a gas pack via an alkaline aqueous solution. The recovered gas was qualitatively and quantitatively analyzed by gas chromatography equipment.

Results and Discussion

Gas components were analyzed by gas chromatography (SHIMAZU GC-2014). Analysis results are shown in Fig. 5 and Fig. 6.

Fig.5 Gas quantity produced

Fig.6 The proportion of methane

Compared with Condition I, Condition V decreased gas production amount. However, it suggested that it should be increased as a ratio of the amount of product gas. **This is presumed to be an action due to the catalytic effect of Molecular Sieves 4A.** Further, in Condition V, since it was possible to make the methane content to **the gas production amount 10% or more**, it is inferred that there is the optimum addition amount in the addition amount.

Conclusion

In this study, pyrolysis was carried out at low temperature by adding pyrolysis by adding additives to simulated food waste and attempt was made to convert to flammable gas, **but as shown in Figs. 5 and 6, the catalytic effect Suggesting an increase in the amount of methane produced by the process.** We were also able to demonstrate the potential for energy conversion of food waste.

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Recovery of Tantalum from Tantalum Capacitor by Pyrolysis Treatment

Tokyo Metropolitan High School of Science and Technology
SAKI Hachinohe, WAKANA Dodo

Abstract

In recent years, the rapid consumption cycle of home appliances is conspicuous. Therefore, the electronic board is also discarded. A large amount of rare metals are contained in this electronic substrate, and recycling thereof is desired. In this research, attempts were made to recycle tantalum capacitors, which are often used in electronic substrates, by thermal decomposition treatment. Hydrotalcite, which is a magnesium-aluminum complex in which a tantalum capacitor is expected to have a catalytic effect, was added to perform thermal decomposition. By adding hydrotalcite, it was possible to remove the tantalum burned substance in the tantalum capacitor.

Introduction

Tantalum is called rare metal, and it is considered policyful to ensure stable supply among metals that are difficult to extract due to rare or abundant technical and economic reasons. Tantalum is one of rare metals (31 kinds) and it is used as a capacitor of electronic equipment. In the future, demand is expected to grow, including mobile phones and PCs, and securing that is required.

In Japan, the so-called "urban mine" is abandoned with a large amount of used electric products containing rare metals. In addition, due to the enactment of the "Promotion of Recycling of Used Small Electronic Equipment etc." enacted in 2012, tantalum and other recycling tend to be prioritized. Therefore, it is desired to develop a new technique for efficiently separating and collecting resources such as rare metals contained in electric devices and electronic components.

Tantalum Capacitor

It uses rare metal called tantalum for the capacitor element, it is smaller than conventional capacitor and can obtain large capacity, so it is used in all kinds of electronic equipment including mobile phones. The calcined body of tantalum occupies 43% of the total mass, and since the fired body contains a high concentration of tantalum, recycling from products to be discarded is desired (Figs. 2 and 3).

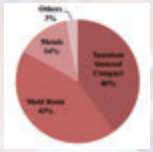

Fig.1. Component ratio of capacitor

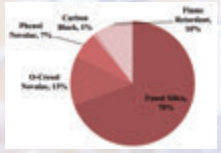

Fig.2. Component ratio of mold resin

Make recycling difficult

The mold resin of the tantalum capacitor contains a halogen type flame retardant such as bromine, and it is generated as a gas during processing. Also, the molding resin has very high physical and chemical stability (fig.3.).

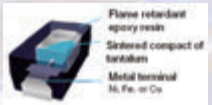

Fig. 3. Tantalum Capacitor (Source: NEC TOKIN Corporation)

Experiment

Previous research…

■Oxidation roasting: Oxidizing roasting at 450 ° C to 500 ° C.

■High Pressure Dissolution: Solubilize in a high-pressure vessel (20 atm) for 4 hours with solvent (NMP) under K_3PO_4.

Both of them have issues such as generation of toxic gas, plant cost, length of processing time, etc. Therefore, it is required to recover tantalum by removing the mold resin without generating toxic gas under comparatively mild condition.

⬇

Hydrotalcite has an anion adsorption effect and catalytic effect, so it is added and thermally decomposed.

What is Hydrotalcite?

Hydrotalcite (HT) is an aluminum-magnesium complex (Fig. 4). It has been shown that when anions are adsorbed, they have the property of changing to a structure called an interlayer outer spherical complex (Figs. 5 and 6) If a sphere can be confirmed as shown in Fig. 6, it can be inferred that anion has been adsorbed.

Fig. 4 Structure of HT

Fig. 5 Before adsorption

Fig. 6 After adsorption

A. Experimental conditions

The sample is a mixed sample with 5 g of tantalum capacitor and 5 g of additive.

Table1 Experimental Condition

Condition	Sample
I	Tantalum Capacitor
II	Tantalum Capacitor + Hydrotalcite

B. Experimental Method

The experimental apparatus used in this study is shown in Fig. 7. A sample was placed in a metal reactor, and in order to remove oxygen from the reactor in 60 minutes, nitrogen substitution was carried out. Nitrogen gas was flowed at a flow rate of 50 mL / min. After purging with nitrogen, the nitrogen gas was stopped and thermal decomposition experiment was carried out. The sample part of the metal reactor was measured as the decomposition temperature.

Fig. 7 Experimental apparatus diagram

It was raised to 550 ° C at 5 ° C / min. Gas that passed through the cooling pipe was condensed to produce oil and was collected in a recovery container. The no condensable gas was collected in a gas pack via bubbling of an alkaline aqueous solution. After pyrolysis, analysis of thermal decomposition products (residue and gas) was carried out. For the residue, the surface was observed with an energy dispersive X-ray analyzer (EDS). Gas components were qualitatively and quantitatively analyzed by gas chromatography equipment.

Results and Discussion

The residue after thermal decomposition (Fig. 8) was mixed with distilled water 100 at a ratio of 3 and stirred with a stirrer to **recover tantalum**. Also, EDS observed the surface of HT. As bromine concentration rose to **31.5%**, it was possible to recover bromine in the residue. **Moreover, it was possible to confirm the formation of spheres, which is a characteristic when adsorbing anion.**

Fig. 8 After pyrolysis

Fig. 9 Removed tantalum

Fig. 10 EDS image of the residue

Tantalum could be removed from the tantalum capacitor by thermal decomposition at 550 ° C. This is presumed to be due to the catalytic effect of hydrotalcite, which promoted the decomposition of the mold resin (Fig. 8 and Fig. 9).

Expected thermal decomposition reaction equation

Organic compound→ H_2+CO+CH_4+low molecular weight organic compound

Further, **hydrotalcite has an anion adsorption effect**, it can be inferred that the generated **gas of halogens contained in the mold resin could be recovered as a residue.**

Conclusion

In this research, **we aimed to recover tantalum by thermally decomposing tantalum capacitor.** In this study, it was possible to decompose the mold resin by **adding hydrotalcite**, so it was possible to take out tantalum relatively easily.

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Research on Utilization of Cedar as Unused Resource

Tokyo Metropolitan High School of Science and Technology
HINAKO Hisaoka, NANAMI Muramatsu, TAIKI SUZUKI, IO Akiyama

Abstract

Japanese forests exceed 70% of the country. However, at present, most of the forest resources tend not to be used for reasons such as price increases and talent shortages. Chiba prefecture near Tokyo is no exception. In Chiba prefecture there is Sambu cedar that is produced 400 years ago. However, Sambu cedar has a widespread peculiar disease and its value is significantly reduced. Therefore, many of the harvested Sambu cedar have been left in the forest as a residual forestland. As an anecdote of a forestry owner, Sambu cedar is said to have the ability to dye in pink. In this study, we attempted to stain pink with remaining material of the forestland that is considered not worth.

Research Background

Japan is a forested power country where forests account for more than 70% of the country's land. However, due to the decline in the timber resource utilization rate of domestic timber, timber self-sufficiency rate is only around 30%. In addition, the number of forests with unused materials left unattended is increasing.

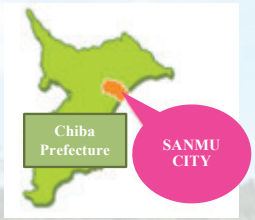

Fig. 1 Research Area

I learned about the current situation of Sambu cedar that was produced in eastern Chiba prefecture (Fig. 1), which is a short distance from Tokyo (Fig. 2). Sambu cedar has been produced since the Edo period, has been produced by a unique production method. However, Fomitiporia sp. has a disease called Fuscoporia Punctata. Its prevalence rate has been reported to be over 85%.

Fig. 2 Sambu cedar

We went to fieldwork in Sanmu City, Chiba prefecture, and examined the present condition. Analyzing the current issues as what we can do, I thought about the project image (Fig.3) that would lead to regional regeneration and forest regeneration. We attempted to find new value for what is considered to be worthless for the purpose of treating the wood left in the forest.

Fig. 3 Project Image

From the fieldwork, it was found that it was the treatment of the forest residue material as a matter to rush. Sanmu has an anecdote of "Cedar that stains in pink". Furthermore, although precedent cases have been reported, dyeing methods have yet to be established. We decided to study the method of dyeing pink using the remaining material of forest of Sambu cedar and to examine the color components.

Experimental Method

We examined how to dye colors that could not be established. There was a report that Sambu cedar could be dyed without using mordant. For that reason we studied dyeing without special treatment. The experimental conditions are shown in Table 1.

Table 1 Experimental Condition

Condition	Sample
I	Do not do special processing
II	Treat with soy milk before dyeing
III	Treatment with milk before dyeing

Experimental Method

Material: 1 L of Water, 200 g of Cedar, Cotton fabric

Step 1 Pour the cedar chips and water in a pot and simmer for 30 minutes at weak to medium heat.

Step 2 Remove the cedar. This is called a dye liquor.

Step 3 Stop the fire and dye it with cloth washed with water.

*** Condition II, Condition III dyed what was processed in Step 3.**

After the experiment, the dyeing solution before dyeing and after dyeing is qualitatively analyzed by GC-MS equipment, and the dyeing components are examined.

Results and Discussion

The dye liquor was diluted 100-fold with ultrapure water and analyzed by comparing the peaks obtained by Shimadzu GC-MS-QP2010ultr (GC / MS). The main compounds were identified by GC / MS spectral library. The qualitative analysis results are shown in Table 2.

Fig. 4 (a) Condition I (b) Condition II (c) Condition III

Table 2 Qualitative analysis by GC-MS

Detecting Substance		Before	After
Material	Molecular Formula		
Octadecanoic acid	$C_{18}H_{36}O_4$	○	nd
Stearic aldehyde	$C_{18}H_{36}O$	○	nd
Octynokite	$C_{10}H_{22}O$	○	○
Silver dodecanoate	$C_{10}H_{19}AgO$	○	nd
Pentadecanoic acid	$C_{15}H_{30}O_2$	○	nd

※○：detection, nd：not detected

Pretreatment was carried out with soybean milk or milk when dyeing, but the coloring was not good. Unprocessed conditions were closest to pink (Fig. 6). Although no mordant is required, it can be inferred that the dye liquor itself acts as a mordant since the metal component is detected from the qualitative analysis of the dye liquor (Table 2).

Conclusion

It can be inferred that dyeing should be carried out as it is without pretreatment or the like. Further, it can be inferred that it is not necessary to add a mordant because the dye liquor contains a metal component.

References

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【2】梶山恵司（2011）「日本林業はよみがえる」日本経済新聞社
【3】青沼和夫（1996）「再考山武林業」グリーン企画出版

Plate a small piese of copper with tin

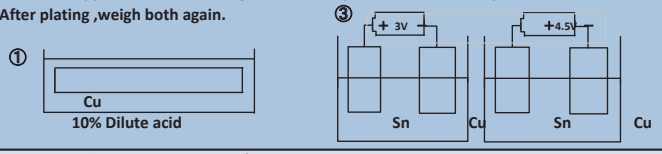
SASAKI Yuho,TAKIMOTO Yuki
Chiba Prefectural Yakuendai High School

<Equipments>

Alligator clips　Dilute asid(The parcent is 10% and 3%)　Sodium hyrogen carbonate　PH test paper

<The experiment procedure>

① Wash a piese of copper for about 10minutes using 10% dilute acid. And weigh a piese of a tin and apiese of copper.
② Sorked the two metals in 3% dilute acid.
③ Plate the copper with the tin using 3volts baterry and 4.5volts baterry.
④ After plating ,weigh both again.



<The result of this experiment>

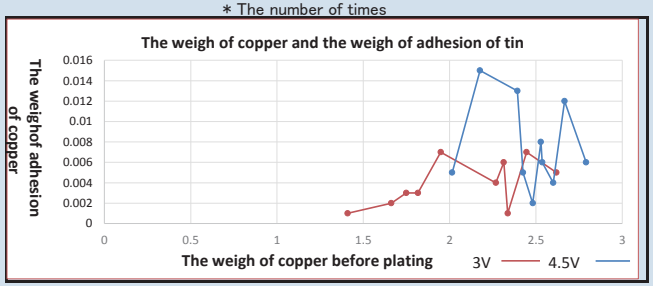
<3V>

g / *	Tin before plating	Copper before plating	Tin after plating	Copper after plating
1	5.622	5.487	2.337	2.338
2	5.487	5.397	2.619	2.624
3	5.397	5.352	1.817	1.82
4	5.352	5.294	2.446	2.453
5	5.294	5.264	1.409	1.41
6	5.264	5.127	1.662	1.664
7	5.127	5.061	1.749	1.752
8	5.061	4.964	2.268	2.272
9	4.964	4.901	1.949	1.956
10	4.901	4.863	2.314	2.32

<4.5V>

g / *	Tin before plating	Copper before plating	Tin after plating	Copper after plating
1	4.852	4.829	2.791	2.797
2	4.829	4.787	2.666	2.678
3	4.787	4.756	2.393	2.406
4	4.756	4.667	2.601	2.605
5	4.667	4.536	2.482	2.488
6	4.536	4.474	2.015	2.02
7	4.474	4.413	2.176	2.181
8	4.413	4.365	2.425	2.43
9	4.365	4.316	2.529	2.537
10	4.316	4.27	2.537	2.543

* The number of times



<Consideration>

For this experiment,I could not trial tests many times.　So,the graph which was made by data of this experiment may not be accurate.
But,putting the case of 4.5volts beside the question,the case of 3volts varied like linear function.　The condition was not different at all expect the weigh of piece of copper.　So I think the reason varying in numerical

A Man Who Suffered from Bounce

NEGISHI Rei, ISHIKURA Kichirou, TAGUCHI Yuji
Chiba Prefectural Yakuendai High School

< Ranking of Men's 100 meters >

World

Name	Record(second)	Year
Bolt	9.58	2009
Tyson Gay	9.69	2009
Yohan Blake		2012
Asafa Powell	9.72	2008
Justin Gatlin	9.72	2015

Japan

Name	Record(second)	Year
Yoshihide Kiryu	9.98	2017
Koji Ito	10.00	1998
Ryota Yamagata		2017
Nobuharu Asahara	10.02	2001
Singo Tamesue	10.03	2003

In 1964, those was one Japanese who ran the 100m in 10.1's. It was the world bestest record this year. The man on the right picture is him,'Hideo Iijima'.　He was expected to be the first runner to break the "10-seconds barrier".

Hideo Iijima

Japanese land short distance player and former professional baseball player (outfielder).

The former 100 meter competition Japanese record holder who has joined Lotte Orions (present: Lotte Chiba Marlins) as a specialist of base running.
【quote from Wikipedia】

< Look at the picturs below >

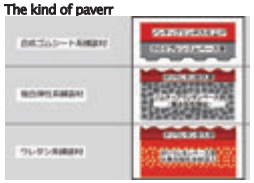
1964　Tokyo Olympic　En-toutcas truck
(A source　Nikkei technology On-line , June 8, 2016.)

National Training Center (Tokyo)
(A soure　KOFU Field corporation, February 7,2018)

As you can see. The record has been improving rapidly synthetic surface track was adopted.
But there isn't Iijima's name on the record. Why ?
Let's think about the mystery with looking properties of that track.

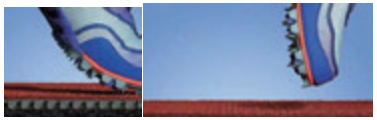
Monde company　**"SUPER－X"**
[Use example]
1992 Barcelona Olympic Games
1996　Atlanta Olympic.
2000　Sydney Olympics.
2004　Athens Olympics.
2008　Beijing Olympic Games.
2012　London Olympics.

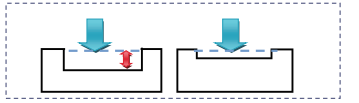
The kind of paverr



< Conclusion >

There are some reasons why synthetic surface track can improve their records.
However, the importance is to understand the physical properties of track.





Reference　KOFU Field corporation homepage

Biology Poster No.19-No.30

No	Subject	School	Presenter			
19	Possibility of the slug and fungi mucus use	Chiba Prefectural Sakura High School	WADA Akane	AKIHO Hiiragi	MATSUDA Rei	
20	Efforts to make a sustainable society in Malaysia & Japan	Chiba Prefectural Kisarazu High School	OKUBO Hiyori	UNOKI Mio	HOSHINO Mana	
21	Relationships between plants & water in a tropical forest	Chiba Prefectural Kisarazu High School	SUGIYAMA Yuya	SAITOU Tamano	ONO Yumea	TAKEI Chihiro
22	Importance of Sunlight	Chiba Prefectural Kisarazu High School	CHIHARA Keita	SUDA Maho	ISOBE Haruna	KAWAI Natsume
23	The deliciousness of NATTO	Chiba Prefectural Chiba Higashi High School	MATSUSHIMA Yuki	KITADA Mai	HIRAO Yuka	
24	Fermented foods are the source of energy!!	Tokyo Metropolitan Tama High School of Science and Technology	ASAHINA Hohoko	IWANAGA Kaho	OINUMA Honoka	KAWAZOE Kanan
			MAEDA Naoko	MIKI Yuto		
25	Growing vegetables from seawater	Tokyo Metropolitan Tama High School of Science and Technology	OZAKI Haruna	OGAWA Miyu	ONODERA Haru	
26	What We Learned from The Field Research in Iriomote Island	Tokyo Metropolitan High School of Science and Technology	MIYAZAKI Ryo			
27	What We Experienced in Borneo ~Environmental Problems and Nature in Borneo~	Tokyo Metropolitan High School of Science and Technology	KATSUHARA Riho	SHIMIZU Miyuu		
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Possibility of the slug and fungi mucus use

Sakura High School Akane WADA(2) Hiiragi AKIHO(2) Rei MATSUDA(2)

Introduction

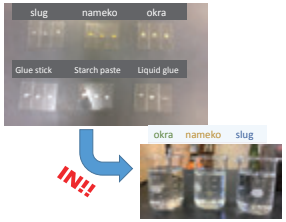
The slug mucus is difficult to remove by washing and rubbing with water when it attaches to hands. Through this experience, we think that it can be used as glue in water. We tested property of three kinds mucus : okra, *nameko,* and slug.

Main components of mucus and glue

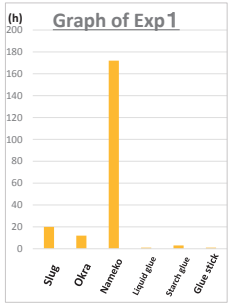
Slug	acid mucupolysaccharide neutrality mucosubstance lectin	Liquid glue	PVAL
Okra	pectin mucin	Starch paste	starch
Nameko	cellulose hemicellulose protopectin	Glue stick	Starch(potato)

Experiment1

We observed mucus and glue which adhere on slide in water.



Result

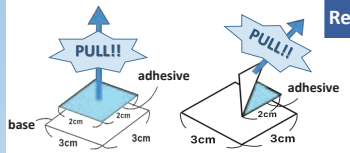


Nameko's **durability in the water is quite high.(Graph of Exp1)**

Slug's mucus generally melted or in the end white objects remained.

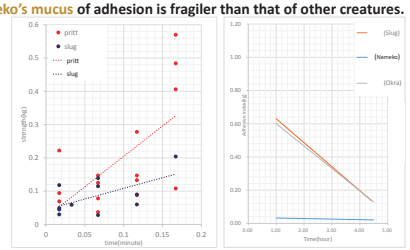
Experiment2・3

- We stuck two pieces of paper together with mucus or glue like below illustration.
- After certain time, we pulled up the paper vertically(①) or horizontally(②) and weighed weight.



Result

- ✓ When slug's mucus dry, its adhesion is increased.
- ✓ The adhesive strength of okra's mucus and slug's mucus became fragile along with the length of time drying mucus naturally.
- ✓ Nameko's mucus of adhesion is fragiler than that of other creatures.



Consideration

- Nameko's mucus remained in the water for a long time because it includes insoluble substance.
- We may use nameko's mucus to mark something in the water.
- We may use okra's mucus or slug's mucus to stick something for a while.

Future Challenge

We want to...

- measure the adhesive strength at short intervals to examine the changes exactly.
- measure the adhesive strength in the water.
- use mucus from boiled okra.

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Mitsuaki MAKI,2010,Studies on the Mucilage of Pholiota Nameko, Journal of Home Economics of Japan,18(Part5):307-309

千葉県立木更津高等学校

Chiba Prefectural Kisarazu High School

Efforts to make a sustainable society in Malaysia & Japan

OKUBO Hiyori UNOKI Mio HOSHINO Mana

[Abstract]

We had some researches about efforts to make as sustainable society in Japan before learning Biomass in Malaysia. In Malaysia, we studied how to recycle palms. Based on what we studied, we consider how to use rice plants to contribute to a sustainable society.

Relationships between plants and water in the tropical forest

kisarazu high school
Yuya Sugiyama, Tamano Saito, Chihiro Takei, Ono Yumea

Clean water

Running water → brooks

↓

Plant's roots working as a filter

↓

Clean

Brown-colored water

Not running water → ponds

↓

Depositing leaves

↓

Brown-colored

Fern
There are many leaves like that

Conclusion

Plants and water work as a cycle that produces clean water resources in tropical forest

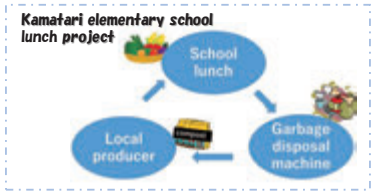
Efforts to make a sustainable society

-In Japan &Malaysia-

Unoki Mio Okubo Hiyori Hoshino Mana

We will introduce effort of Japan and Malaysia and our opinion that this kind of action can be done in the future .

Efforts in Japan



Efforts in Malaysia

From now on

In Japan, The most popular crop is rice! Then...

Percentage of Hemicellulose is high!
=**Soft**

Plant's body is constituted by
- Hemicellulose
- Cellulose
- Lignin→**Hard**

Bio plastic

Easy to be decomposed!

5 times as strong as iron!!

- Building materials
- Car
- Household appliance...

Cellulose nanofibers

引用：京都大学生存圏研究所、森林総合研究所

We think that the result of the research should be connected with more practical use.
And we hope that efforts to make sustainable society should be increased.

The deliciousness of NATTO

Matsushima Yuki
Kitada Mai　Hirao Yuka

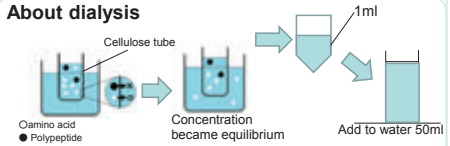
Motive and Outline

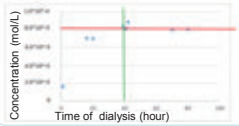
NATTO is one of Japanese traditional foods. It is known that its deliciousness varies by the amount of mixing. we had a question why its deliciousness varied. So we thought "become delicious=the amount of amino acid increase" and mainly examined its comparison because NATTO contains amino acid. First, We measured concentration of amino acid and understood that amino acid increased by mixing NATTO. Next, we experimented to examine why amino acid increase by mixing. From results, we thought it wasn't the effect of the enemies, but amino acids sticking to NATTO dissolved in stickiness.

How to make liquid of NATTO

①Mixed NATTO ②Rinsed it with water ③Filtered
④extracted only liquid

About dialysis





It is 48 hours that Amino is equilibrium. Therefor we decided that we will do dialysis for 40 hours.

Experiment1

Relationship between the number of mix and the amount of amino acid.

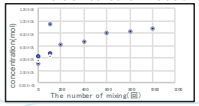
Whether the more we mix NATTO, the more amount of amino acid.

Dialyzed the liquid of NATTO Mixed 0,100,200,400,600,800,or 1000times.

Confirmed ninhydrine reaction and measured absorbance

Calculated concentration

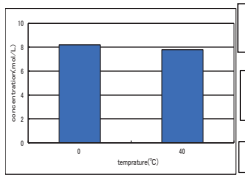
Result The number of mixing and the amount of amino acid



Consideration
The amount of amino acid increased with the amount of mixing. However, over 600times, increasing became small. the reason was shaving them and effect of the enzymes.

Experiment2

Relationship between the enzymes and the amount of amino acid



Dialyzed the liquid of NATTO Mixed 100times in 0℃and 40℃

Confirmed ninhydrine reaction and measured absorbance

Calculated concentration

consideration We can't find between result of 0 and 40℃ In conclusion, enzymes wasn't the effect of increasing amino acid.

Experiment3

Relationship between crushed NATTO and the amount of amino acid

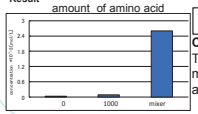
Whether the amount of amino acid increased with crushing

Dialyzed the liquid of NATTO crushed by mixer.

Confirmed ninhydrine reaction and measured absorbance

Calculated concentration

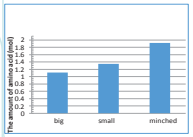
Result To crush NATTO and the amount of amino acid



Consideration
The more amino acid could be got, the more NATTO mixed. We thought amino acid is included in NATTO.

Experiment4

Relationship between the size of grain of NATTO and the amount of amino acid



Dialyzed the liquid of three kind of NATTO (big, small, minced)

Confirmed ninhydrine reaction and measured absorbance

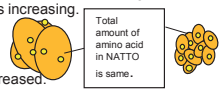
Calculated concentration

Result The lager surface area is, the more it has amino acid.

Mechanism of increasing amino acid

From those experiments
・The amount of amino acid increased with the amount of mixing.
・NATTO has many amino acid the internal it.
・Amino acid increase physically instead of chemistry.
・Total amount of amino acid in NATTO doesn't change.
・Enzymes aren't involved in this increasing.

In conclusion,
we found the more NATTO has shaved points, the amount of amino acid is increased.



Summary

We thought the reason why NATTO became deliciousness when we mixed NATTO was that amount of amino acid increase as mixing NATTO. That reason is that NATTO is shaved and amino acid in NATTO dissolved. We want to experiment about self life of NATTO from how on.

Bibliography バンクスライク法、Sorensen法(ホルモール滴定法)及びニンヒドリン比色法で得られるアミノ態窒素の定量値に関する比較研究

Equipment we used APEL corporation Ultraviolet-visible spectrophotometer PO-303UV

The kind of NATTO タカノフーズ株式会社 極小粒ミニ3 旨味ひきわりミニ3 ミツカン 国産大粒3P

International recital 04/02/2018

Fermented foods are the source of energy!!

～Investigate the power of Japanese miso～

Tokyo Metropolitan Tama High School of Science and Technology
H Asahina、K Iwanaga、H Oinuma、S Okano、T Ozawa、S Onuma、K Kawazoe、N Maeda、Y Miki

Overview

Fermented foods are a vital part of Japanese food. Of these fermented foods, we focused on miso and ①studied the difference in miso distribution in Japan, and ②made miso. In the future, we plan on making miso with a different main ingredient, study the relationship between yeast(rice koji, barley koji, bean koji) and water in different parts of the country, and furthermore, study and research the detoxification effects that miso holds.

Objective

① Study the difference in miso distribution in Japan.
② Teach the splendor of miso through miso making.

Investigation

From the miso distribution in Japan, we studied the differences.

【Results and examination】

Miso is made by adding yeast to soybeans. From our investigation, we found a difference in the yeast from east and west Japan.

→East Japan uses rice koji, while west Japan uses rice, barley, and bean koji as the main ingredients to produce miso. Japan having four seasons and a unique landscape with each area having a different climate largely affects which ingredient is used.

Miso making

① Steam and mash soybeans.
② Add rice koji and salt.
③ Ferment for 10 months.

Fermenting was done by each student at their homes, and brought to school 10 months later.

Fig.1 Miso made

【Results and examination】

White mold has grown!!

→This is thought to be yeast. The cause of the yeast covered miso was most likely due to humid fermenting conditions and the miso came in contact with air.

The color is different!!

→This is thought to be the difference in the Maillard reaction. The Maillard reaction is a chemical reaction between amino acids and sugars that results in browning. The difference in color was due to the difference in fermentaion condition.

Making miso soup

① Add ingredients to hot water.
② Boil until ingredients are soft turn off heat.
③ Add miso.

【Results and examination】

Fig.2 Cooking process

The difference in taste of each miso.

→Each miso had a different taste. Especially, the miso with the yeast growing on it was largely different so we will test further from this.

Fig.3 Miso soup made

Conclusion

① We found that the difference in miso in east and west Japan is due to the difference in koji used in making miso.
② The large difference in taste that occurred was influenced by the reaction of amino acids and sugars.

Outlook

① Study miso from all of Japan and research the difference in each area.
② Advance experiments on low sodium effects, cancer prevention, and detoxification effects of miso. Also, we will research miso soup ingredients and the effects of miso.

Source of references

Marukome homepage / miso picturebook / Marukawa miso homepage

Growing vegetables from seawater

Tokyo Metropolitan Tama High School of Science and Technology
Haruna OZAKI MiyuOGAWA Haru ONODERA

ABSTRACT

In this experiment, we explored to get rid of salt in seawater. We stirred it after mixing additives. The additives tested were molecular sieve 3A, 4A, 5A, 13X, and hydrotalcite($Mg_6Al_2(CO_3)(OH)_{16}\cdot 4H_2O$).

We found that molecular sieves 4A and hydrotalcite adsorb the most chloride ions, and molecular sieve 4A can be reused.

PURPOSE OF THE RESEARCH

★ **Get rid of NaCl** from seawater easily at low cost.

★ Use the seawater **for agriculture**.

Fig 1 Image of the research

ADDITIVES

★ Use something to adsorb chloride or sodium ions for stirring with seawater.

⇒ **Molecular sieve** and **hydrotalcite**!!!

EXPERIMENT

(1)1. Add some additives to adsorb NaCl.

Experimental conditions are shown in table.1

Table.1 Experimental conditions

1		
II		
III		
IV		
V		
VI		

2. Stir seawater at 200rpm, for 1hour.

3. Filter out the additives in the seawater.

4. Analyze the filtrate and the remnant.

5. Repeat step1~4 3times.

(2) Bake molecular sieve 4A that used in (1) for 1 hour, 150℃. And analyzed them before and after that treatment as same as (1).

RESULT

Each sample solution was diluted 10-fold, and the amount of change in chloride ions and sodium ions was examined using an ion chromatograph. A Shim-pack column (150ℓ×4.6), detector CDD-10Asp on a Shimadzu HPLC ion chromatography system was used.


Fig 2 condition Ⅰ

Fig 3 condition Ⅱ

Fig 4 condition Ⅲ


Fig 5 condition Ⅳ


Fig 6 condition Ⅴ


Fig 7 condition Ⅵ


Fig 8(a) EDS image of the Molecular sieves before the treatment condition Ⅱ.


Fig 8(b) EDS image of the Molecular sieves after the treatment condition Ⅱ.

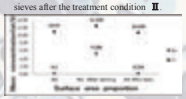


Fig 9 The surface of the additives was observed and analyzed for changes in sodium and

ANOTHER EXPERIMENT

Next, we tried to know whether we can grow sprouts also with desalinated seawater. We conducted verification experiments at various concentrations..

Growing 1st day


Fig 10 (a) 4 fold (b) 10 fold (d) fresh water

Growing 6th day

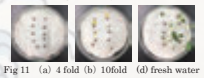


Fig 11 (a) 4 fold (b) 10fold (d) fresh water

DISCUSIOSN

Molecular sieves and hydrotalcite **adsorbed Cl^- under all conditions.** (See Fig 2~7) But the density of Na^+ and Cl^- in the solution did not decrease steadily. Molecular sieve 4A and hydrotalcite were shown to **adsorb the most chloride ions.** (See Fig 3,7) The EDS images suggest that molecular sieve 4A adsorb Cl. (See Fig 8a, b)

Sodium and chloride **increased** from original quantity after stirring into seawater, but after baking, **the quantity returned before stirring.** From this result, it is thought that to bake molecular sieves could decrease NaCl and **reuse them.**(See Fig 9)

In the cultivation experiment, 4 fold dilution did not allow sprouts to germinate. But 10 fold dilution allowed sprouts to germinate. It is thought that the growth range is between **4 fold and 10 fold.** (See Fig 10,11)

CONCLUSION&FUTURE RESEARCH PLAN

★ Molecular sieves and hydrotalcite were not able to adsorb sodium ions.

★ **Molecular sieve 4A** and hydrotalcite were shown to adsorb the most **chloride ions.**

★ After baking the molecular sieve, the quantity of both sodium and chloride decreased, then we think **it can be reused and** make fresh water **at low cost.**

★ From now on, we will research about **how amount of water** molecular sieve can make seawater to freshwater, and **how many times** it can reuse.

★ By diluting the results between **4 and 10 fold**, we can use them for agriculture.

★ From the cultivation experiment, diluted seawater allows sprouts to germinate. Then, we are going to analyze the sprouts and make sure that they are safe.

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[2] 沖大幹,「水危機」,新潮選書,2012.
[3] 池上康之,志水倫恵,「海水の農業利用に関する基礎的実験」,OTEC, 2007.

What we learned from the field research in Iriomote island

千葉大学次世代才能ステップアッププログラム 第3回国際研究発表会
Ryo Miyazaki Tokyo Metropolitan High School of Science and Technology

What is Iriomote island?

The island belongs to Okinawa, Japan

Area	284.4㎢
Climate	Subtropical climate
Average temperature	About 23.3℃
Annual rainfall	2,500㎜
Average humidity	82%
Population	About 2,300 people

The purpose

I visited Iriomote island with seven students in summer, 2017.

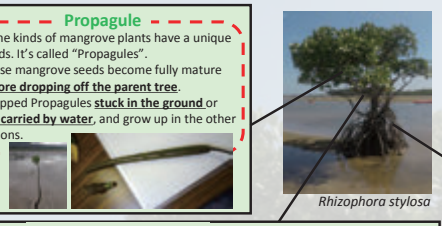
Through the field work of this island, we could see the subtropical ecosystem and learned its function. And could learn how to investigate in the nature field.

Mangrove has three unique specialties

What is Mangrove?. . . ``Mangrove" means the forests formed in the coastal zone. **They can live in the seawater!**

Propagule

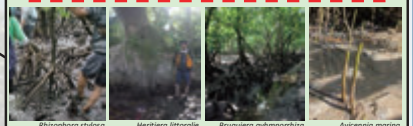
Some kinds of mangrove plants have a unique seeds. It's called "Propagules".
These mangrove seeds become fully mature **before dropping off the parent tree**.
Dropped Propagules **stuck in the ground** or **are carried by water**, and grow up in the other regions.


Rhizophora stylosa

Special root form

In the coastal zone, the wave hits the mangrove.

To breathe and **to support their own body**, mangrove develop **special shapes of roots**.


Rhizophora stylosa *Heritiera littoralle* *Bruguiera gyhmnorrhiza* *Avicennia marina*

Prop root Branch roots are like an octopus.

Board root Board root provides stability.

Knee root Emerge as a root loop from the underground root system.

Pencil root Pencil roots grow up vertically from underground root system.

Salt Emission System

Normal plants can't live in the seawater because of its salt. However, mangrove plants have **special system** to get salt out. They absorb the seawater from their roots, and **store it in their leaves** to drop off the salt with leaves.

Creatures that I saw in Iriomote island

Animals

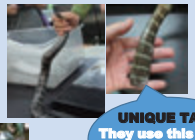
~Bird~

Crested serpent eagle *Spiliornis cheela*

~Reptile~

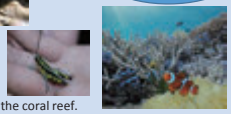
Black bandedsea snake *Laticauda senifasciata*

Yellow marginebox turtle *Cuora flavomarginata evelynae*



~Insect~

Grasshopper *Trauria ormata iriomotensis*
This grasshopper lives only in Iriomote island.



~Fish~

Clown fish *Amphiprion ocellaris*
Clown fish lives with some "sea anemones" in the coral reef.

Plants

~Mangrove~

【1】 *Kandelia obovata*

【2】 *Nypa fruticans*

~Fern plant~

We made specimens of some kinds of ferns

【3】 *Tectaria decurrens*

【4】 *Lindsaea japonica*

【5】 *Cheiropleuria bicuspis (Bl.) Presl*

【6】 *Thelypteris triphylla*

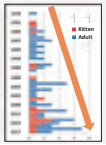
Discussion

Iriomote island has so many rare creatures. We learned the rich nature of Iriomote island and how interesting it is.

I also learned that the nature is being destroyed because of the increased number of tourists. As the number of tourist increases, the number of car accidents that kill the wild cat increases. I think the Iriomote's nature is Japan's treasure. To protect Iriomote island, it is important to have everyone know about the importance of this island.

Car accidents of endangered wild cats

Wild cats are facing the threat of extinction.



Acknowledgements

We would like to thank the following persons from Tropical Biosphere Research Center, University of the Ryukyus for their great help.
・Shigeyuki Baba, Professor Emeritus ・Tadashi Kajita, Professor
・Shin Watanabe, Associate Professor ・Akiyo Naiki, Associate Professor
・Noriko Kidera, Collaborative Researcher

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千葉大学次世代才能ステップアッププログラム第３回国際研究発表会

WHAT WE EXPERIENCED IN BORNEO

～ENVIRONMENTAL PROBLEMS AND NATURE IN BORNEO～

Riho Katsuhara, Miyuu Shimizu 2nd grade of Tokyo Metropolitan High School of Science and Technology

We visited Kota Kinabalu, Sabah, Malaysian Borneo in March, 2017 and did field research to know about the nature of Southeast Asia. Borneo is the third-largest island in the world. There is a large tropical rain forest where lots of precious wild species live.

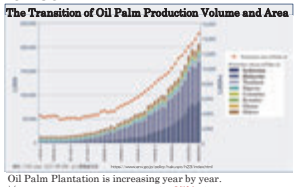
Purpose of our trip ① To know the current situation of **DEFORESTATION** ② To see the **WILDLIFE SPECIES** living in Borneo

Environmental Problems in Borneo

Do you think this is a natural forest?

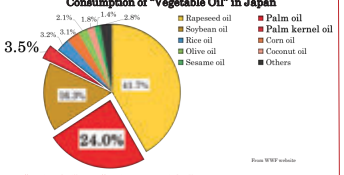
This "Oil Palm Plantation" is artificially created by humans after destroying natural forest.

The Transition of Oil Palm Production Volume and Area



Oil Palm Plantation is increasing year by year.
Malaysia and Indonesia account for 85% of world production of Oil Palm.

Consumption of "Vegetable Oil" in Japan



From WWF website

"Palm Oil" and **"Palm Kernel Oil"** account for **27.5%** of the 2.5 million tons of vegetable oil consumed in Japan.

Why do people produce the oil palm so much?

- They can produce the **Oil Palm** up to about **4t** per hectare, while **Rapeseed Oil** is produced up to **1t** per hectare
- Once planted, they can keep high productivity for up to 40 years.

$ The more they planted the Oil Palm, the more they get money! $

Planting Trees - Mangrove Rehabilitation Project -

We joined "The Reforestation Project" of Sabah Forestry Department (SFD) which is the government agency in Malaysia and International Conference on Sustainable Mangrove Ecosystems (ISME)

We planted 2,500 propagules (seeds of mangrove) on the Disused Shrimp Ponds or Deforested Area to revert back to the original forest.

After planting the propagules

5 months after planting

High school students and local staffs

Kota Kinabalu Wetland Center

Collared Kingfisher *Halcyon chloris*

Mangrove Forest

Lok Kawi Wildlife Park

Asian Elephant *Elephas maximus*

Bornean Orangutan *Pongo pygmaeus*

Klias Peat Swamp Field Center

Careades plana

Tropical Rain Forest

Klias River

Monitor Lizard *Varanus* sp.

Proboscis Monkey (female) *Nasalis larvatus*

Discussion

- **Before we went to Borneo,** we have already known about those environmental problems. **BUT,** we felt those are far from me. After this field research, we were shocked to find out that we were using a lot of None-eco-friendly products made in those plantations. So, we realized that **we are destroying the world forests indirectly** and **we took the habitat of creatures away**.
- **However,** it is important for Malaysian to get money by producing and selling the Oil Palm to the developed countries. We also learned that there are some facilities made with Oil Palm profits. **It is difficult and complicated problem to enrich the human life while protecting the nature.**

→ **IN CONCLUTION,** it is too difficult to remove the Oil Palm Plantation in Borneo, but we think it is important not to expand. For now, the rate of the world Palm Oil consumption is increasing year by year. In order not to increase it anymore, **it is also essential to have many people know the current situation of the plantation**. So, that's why we are now introducing the threatened nature of Borneo. **We strongly want all of you to think about Borneo nature in your day-to-day life.**

Acknowledgements
We would like to thank the following persons for their great help.
1. Joseph Tangah, Jamis Arbin, Dauni Seligi, Fabian Kpret, Sudiknoh Maksut : Sabah Forestry Department
2. Shigeyuki Baba : University of Ryukyus , ISME **3.** Norimi Kimura : ISME
4. Emi Ozawa : Tokyo Metropolitan Tama High School of Science and Technology
5. Ryuhei Sato : Tokyo Metropolitan High School of Science and Technology

References
[1] Ministry of the Environment in Japan (2011), *Consideration of sustainability of verification and richness*
[2] Malaysia National Tourism Organization official web site, *http://www.tourismmalaysia.or.jp/*
[3] World Wide Fund for Nature (WWF), *What is the Vegetable Oil?*- palm_oil.pdf
[4] Makoto Yokotsuka (2011), *Field guide of Iriomote island* - Jitsugyo no Nihon Sha, Ltd
[5] Joseph K.H.Koh, Leong Tzi Ming (2014), *SPIDERS OF BORNEO With Special Reference to Brunei* : Opus Publications

たばこの副流煙とカイワレ大根の発芽率

Influence of Sidestream smoke on the rate of germination of Radish sprout.

Kota Tachikawa & Ryota Masuda
Shibaura institute of technology Kashiwa high school (2nd grade)

In the following, Radish sprout and Broccoli sprout is shown as "Radish" and "Broccoli".

Driving Question:
We often heard that cigarette's smoke influenced the human body. Recently, it is said that sidestream smoke is more harmful to us than mainstream smoke. Then, we did an experiment with interest in how much sidestream smoke would affect the plants that can not escape from the smoke.

Methodology:
We raised the seeds of radish without nutrition for 4 days. We used 3 g of radish seeds and 1 g of broccoli seeds. We spread cotton in petri dish, add 20 mL of water and sow sprout seeds all over.
We made 2 boxes of cardboad ,and raised sprouts in it with smoke and no smoke for Control. We changed the smoke every day and changed the water once every two days.
We found smoke of cigarette is heavier than air, so we put in the smoke from the top of boxes. The boxes were covered with vinyl so as to hold the smoke. Furthermore , We also made a lot of ingenuity, so please read it in the poster.

Results and Discussion:
Generally the germination rate depends on the temperature. But some influences of sidestream smoke are observed.

In Broccoli , There was no significant difference between smoke and Control in length and weight of sprouts , It seems there was no influence by sidestream smoke.

In Radish, The germination rate was observed no significant change in MEBIUS (a brand of cigarette with a small amount of nicotine and tar.) And ECHO(with the nicotine and the tar amount in the middle value), the germination rate was lower than Control when adding sidestream smoke. From these two results, the germination rate is influenced by the amount of nicotine and tar contained in sidestream smoke.

Follow the Traces of Gentian

NISHIMURA Kana,HASHIMOTO Shiori,MUKUMOTO Mai,SHISHIKURA Kana
Chiba Prefectural Yakuendai High School

Summary

Our school emblem is a gentian. Why is this whole medical herb garden during the Edo period from gentian was cultivated there. However, according to the history data of Funabashi-City, the cultivation record of gentian is unknown. So we explored habitats from gentian cultivation. We found that the results are difficult to grow in the current environment gentian.

Experiment

1.【Cultivation of Gentian】Gentian species grown in pots

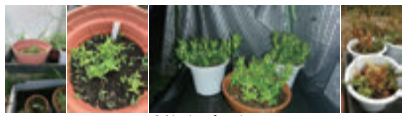
Gentian distributed Honshu, Shikoku and Kyushu. It is perennial herb native to the sunny meadows and slope. The Rhizome is pale yellow, fibrous roots to many.

Stems are erect, and the height is 30-60 cm. Opposition to leaves length 4-12 cm, It is flat and slender, sharp and like a bamboo leaf.

Gentian (Garden species)

Also known as medicinal herbs, nowadays Garden improvement is thriving and many varieties are distributed as an ornamental. Gentian are growing in soil that is **well-drained acidic soil.** Do not give water for too many and the frequency of water mug and from root rot and root rot because of hot and humid soil surface is dry.

Results



Cultivation of gentian

2.【Genetic analysis】Polymerase Chain Reaction,PCR)

Denaturation → Annealing → Elonation

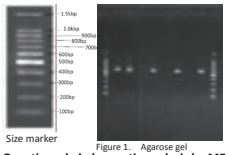
Sample : Three species of gentian (Ashirorindu, the type unknown Gentian the species what seems to federindu)

Method : On the way to genetic analysis. First of all by the Dneas after the DNA extraction, DNA concentration measurement Do. To amplify the DNA for PCR (polymerase interaction Chain reaction) of the then perform electrophoresis, 100 V, 15 minutes in agarose gel. Then perform a nucleotide sequence analysis. Search for names in the Y list. Accessed to the NCBI site, to got the nucleotide sequence in FASTA format file. A phylogenetic analysis based on MEGA. Using the nucleotide sequences of the chloroplast gene rbcL and matK genes specifically.

Supplement use Primer: chloroplast rbcL gene rbcL:
ribulose-1, 5-L subunits bisphosphate Carboxylase / oxygenase (large subunit) gene. Is often used for the barcode area to identify the species of plants. To amplify the fragments is approximately 600 bp.

Results

Agarose gel electrophoresis 500 ~ 600 bp near the strong bands were observed. Three samples showed almost the same position.(Figure 1)



Size marker

Figure 1. Agarose gel

(1) Size marker
(2) gentian type unknown
(3) as well as (2)
(4) ashirorindu
(5) (6) what seems federindu
(7) Size markers

Genetic and phylogenetic analysis by MEGA

Three gentian is an array of rbcL and matK nucleotide both match DNA of gentian, and ezolindu was 1 base. Found out that was a mates for gentian species gentian 2 species unknown thought from the DNA sequence, federindu and unknown. Horticultural varieties and wild species showed less changes in DNA sequences.

Examination

1.【The medical herb garden】Examine the history of the TAKIDAINO.

Shohau and Tauemon are from the Tokugawa shogunate ordered development of the herb garden. In 1722, Shohaku was developed to cultivation of the medical herb garden and medical plants.

However, the kinds of medical herbs were grown was unknown and no record of management. Then the medicine Garden was abolished and became the name of a place called YAKUENDAI-SHINDEN.(Figure 2)

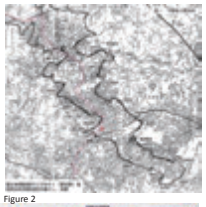


Figure 2

2.【Yakuendai high school】Position and Surrounding terrain features

Spread flat area above sea level 27~28.5cm Center, and the elevation **28.5-30 m** is surrounded by sloping the school site is located on sloping land.

Exit of the Yakuendai watershed circle is located NARASHINO station only. (Figure 3,4)

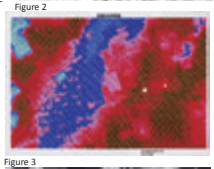


Figure 3

Figure.5
Submerged Narashino station(10/2013)
Water collects in the low lands.

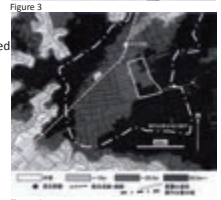


Figure 4 Yakuendai catchment areas

Consideration

By using agarose gel electrophoresis, marker size compared to the chloroplast rbcL gene of Ashiro Rindou gentian in the wildlife species and horticultural species. Deduce the result from almost the same, and growth characteristics similar to those. Our height 28.5-think for 30 m that is surrounded by sloping terrain, water accumulates and poorly drained. For this reason, most likely is not suited to gentian.

Future challenges

Why didn't follow herb garden, places an herb garden is well drained, I guess quiet and gentian are difficult to grow in. From the experimental results, instead of the wild species gentian horticultural species gentian grown again examine the cultivation environment and then die. Want to try playing the wild species gentian, Funabashi-City in future.

Thanks: This study was of biotech information dissemination of science education. Toho University Faculty of biology, Department of plant ecology laboratory Shimono Ayako teacher also taught how to genetic analysis of the gentian genus. Yakuendai high school Earth Science Department Advisor Saito Naoto teacher offered Yakuendai near geological data provided by. We want to thank those who assisted us with our research.

Bibliography: Education and science luck motion No.77 (9/2016) p29 Yasashiiengei http://yasashi.info/ri_00009g.htm 9/24/2017
Become a drug in their plant encyclopedia p185 Wild names p332, p333 History of Funabashi-city p40,p92 Tokyo Bay Funabashi vivid 2013-2012(Figure5)

RESEARCH ON NATURAL YEAST BREAD

Shibaura institute of technology Kashiwa high school
2-3 Hiroka Takahashi
Soyoka Miyano

WHAT'S NATURAL YEAST BREAD?

It uses the yeast adhere to natural fruits and has unique taste, smell and texture.

SUMMARY OF EXPERIMENT

1.CULTURE

We had difficulty in finding the best culture method.

We tried the following 2 ways.

・Agar plate culture

・Bottled liquid culture ↓

2. BAKING

We baked bread by using the bread machine.

3.TASTE

RESULT

We found some differences among tastes of each bread.

LASTLY

We are happy to have learned many things about natural yeast for two years.

Twincle Poster No.31-No.48

No	Subject	School	Presenter			
31	Coconut Dance	Royal University of Phnom penh	Hin Sophea	Ann Monyrath		
32	Characteristics of the Epidermal Anatomy of the Genus Nepenthes in Thailand	Chulalongkorn University	ACHIMAR SAKKARIN			
33	The saw u	Chiang Mai university	Jumrat Patsakarn			
34	Mohom:natural-dyed products from Phrae,Thailand	Chiang Mai university	Sornun Wipaporn			
35	Indonesia's coffee map	Universitas Indonesia	Paskalis Nandana Yestha			
36	HUMAN BEHAVIOR TOWARDS DOMESTIC WATER CONSERVATION EFFORTS	University Gadjah Mada	Helvetia Wijayanti			
37	Graphene Oxide Synthesis from Speargrass(Imprerate cylindrica)	Institut Teknologi Bandung	Muhammad Ilham Bayquni			
38	The Role of Dietary β-carotene in Human Health:Literature Review	Bogor Agricultural University	Bahriyatul Marifah			
39	Screening of Rhizosphere Actionmycetes as Bioprotectant on Soybean Plant	Bogor Agricultural University	Hima Dewi Mariastuti			
40	Balinese Cultural Things:Traditional Dance and 'KEBAYA'	Udayana University	Putu Dea Gayatri Ningtara		Effa Chalisah Jawas	
41	Thai Performing Arts	Kasetsart University	Norsing Khanathip			
42	Future of the Education	Mahidol University	PATTANACHAROENKIT SIRAWIT			
43	Dù ai đi ngược về xuôi Nhớ ngày Giỗ Tổ mùng mười tháng Ba	Vietnam National University, Hanoi	NGUYEN THI HANH	NGUYEN THI YEN		
44	The Scientific Attitudes Of Students Major In Science In The New Teacher Education Curriculum	Pangasinan State University, Bayambang, Campus Philippines	LACAP MARJORIE PEREZ	MAGALONG NATHANIEL LABARO		
45	Traditions of Thailand’s Songkran Festival	King Mongkut’s University of Technology Thonburi	Chaiyarit Wuttichai			
46	TWINCLE UNIT A	Chiba University UnitA	WATAHIKI Yasuhito	OGATA Chiaki	SANO Hikaru	MORISHIGE Hina
47	TWINCLE UNIT B	Chiba University UnitB	YAMADA Kenta	MIYAHARA Rina	UEHARA Fumino	TSUCHIYA Ayako
48-1	Twincle in Thailand	Chiba University UnitC	TAKAYANAGi Kohei	SAITO Akane	SASAKI Ayano	MIZUTANI Moe
48-2	TWINCLE PROGRAM IN THAILAND	Chiba University UnitD	KAWASHIMA Ayane	OGAWA Rio	NISHIKAWA Chika	YOSHIDOMI Keigo

Characteristics of the Epidermal Anatomy of the Genus *Nepenthes* in Thailand

Sakkarin Achimar[1] and Anitthan Srinual[2]

[1] Faculty of Education, Chulalongkorn University [2] Faculty of Science, Srinakharinwirot University

Abstract

The anatomy of leaf blade, pitcher and lid epidermal characteristics of the genus *Nepenthes* (Nepenthaceae) in Thailand were investigated. The samples were prepared by leaf epidermal peeling and clearing method, stained with 1% safranin in 70% ethanol. The results indicated that the significant leaf blade, pitcher and lid epidermal characteristics for some species delimitation are shapes of the epidermal cell, characteristics of anticlinal cell wall and types and the distribution of trichome. In addition, the generalized epidermal characteristics in species studied are as follows: smooth cuticle, types of the anomocytic stomata, types of the stellate trichomes and types of druses crystals.

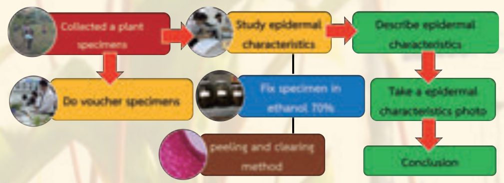
Introduction

Genus *Nepenthes*, common name is Tropical Pitcher Plant. It has distribution in the forest replacement, in the soil with low nutrient acid. Data from the study on the ecology and distribution of Nepenthes in Thailand (Soodjai et al. (2555)). The researching for Plant species group whom rare and endangered in 2012 identify that found Nepenthes are 7 native species and 1 variety. There is currently no study on the anatomy of Nepenthes in Thailand. In addition, the classification of Nepenthes plants is still problematic because the most of the Nepenthes species produce 2 types of pitcher. At a young age the pitcher is short, rather round, hanging down to the ground, this pitcher is called lower pitcher. When the trunk began to lengthen. It creates a pot that is slimmer and can be conical, this pot is called upper pitcher.That is the reasons why it is very confusing to classify. That why we attend about the anatomy of Nepenthes should be studied in order to share the information with other data. To help identify Nepenthaceae family is clearer and more accurate.

Objective

To study epidermal tissue characteristics of blade,pitcher and lid of genus *Nepenthes* for use as a taxonomic information.

Method



Result

The results reveal in fig.1-3, showing the comparisons of leaf, pitcher and lid epidermis of plants in genus Nepenthes. Leaf epidermal cells have irregular, jigsaw and pole-like shape. Anticlinal wall are concave and wavy. Trichomes are branched peltate, hair and stellate with druse, raphide and prismatic crystal. The waxy zone on pitcher has concave and wavy anticlinal wall. Its trichomes are also branched peltate, hair and stellate. Epidermal cells in digestive zone have irregular, jigsaw shape. Anticlinal wall are straight, concave and wavy Trichomes are branched peltate, hair and stellate with druse, raphide and prismatic crystal. The lid's cells have straight and concave anticlinal wall with branched peltate, hair and stellate trichome.

Blade

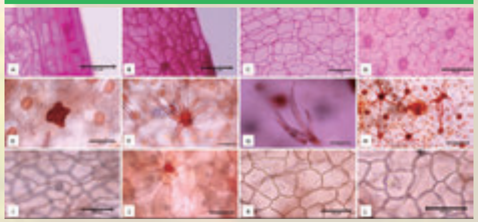


fig.1 Blade epidermal tissue : A.-B. blade margin C.-D. between margin and midrib E.-H. Trichome I.-L. Crystal
E. Peltate trichome F. Stellate trichome G. Hair H. Branched trichome I.-J. Druse crystal K. Raphide crystal L. Prismatic crystal

Pitcher

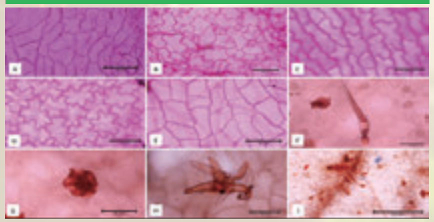


fig.2 Pitcher epidermal cell : A.-B. Waxy zone C.-E. Digestive zone F.-I. Trichome
F. Hair G. Peltate trichome H. Stellate trichome and I. Branched trichome

Lid

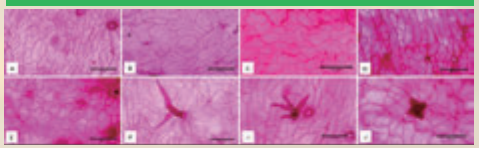


fig.3 Lid epidermal tissue : A.-B. Upper epidermal cell C.-E. lower epidermal cell F.-J. Trichome
F. Hair I. Stellate trichome J. Peltate trichome

Discussions and conclusions

From the results epidermal tissue of the genus *Nepenthes* was found to be consistent with Metcalfe and Chalk (1957), Stanescu and Toma (2008) and Macfarlane (1908). are reported epidermal cell have a irregular shape and similar pillar anticlinal wall have a wavy surface.There are also peltate trichome, stellate trichome, branched trichome and hair. And the study found additional characteristics in some species are raphide crystals and prismatic crystal in epidermal cell.

Reference

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Metcalfe, C.R. & Chalk, L. (1957). **Anatomy of the Dicotyledons**. Oxford at The Clarendon Press.
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the saw u

THE SAW U IS A THAI BOWED STRING INSTRUMENT.

IT HAS A LOWER PITCH THAN THE SAW DUANG AND THE LOWEST SOUNDING OF THE SAW FAMILY.

THE SOUNDBOX IS MADE FROM COCONUT SHELL THAT IS COVERED ON THE OPEN FRONT BY COW SKIN.

THEY SAW U IS HELD VERTICALLY AND HAS TWO SILK STRINGS THAT ARE PLAYED WITH A BOW.

THE BOW IS MADE OF HORSE TAIL HAIR LIKE EVERY OTHER BOW LIKE WESTERN STRING INSTRUMENT.

THE SAW U WERE PLAYING TRADITIONALLY ON THE SLAP SITTING DOWN.

THE SAW U CAN BE PLAYED AS A SOLO INSTRUMENT IN ANY CASE BUT IS MAINLY USED FOR THE BACKBONE IN SOME ENSEMBLE.

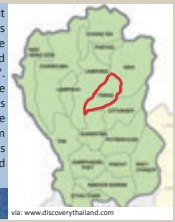
MISS JUMRAT PATSAKARN
FACULTY OF EDUCATION
CHIANGMAI UNIVERSITY THAILAND

Mohom : natural-dyed products from Phrae, Thailand

Wipaporn Sornun Chiang Mai University

Phrae

Phrae Province is one of the most ancient cities of Northern Thailand. Phrae was established in 1371 B.E. by Phaya Pol. The former name was "Pol Nakorn" , then changed to "Wiang Ko Sai" which means "Silk Cloth". Phrae is known as a peaceful city that has the largest reserved teak forests in Thailand. It is surrounded with mountains, and located on the banks of the Yom River. The distance from Bangkok to Phrae is 555 kilometers. Phrae is also famous of its natural-dyed fabrics called 'Mohom'



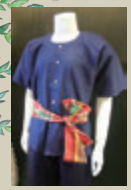
via: www.discoverythailand.com

History of Mohom

'Mohom' is the combination of 'Mo'/mɔː/ and Hom /hɔːm/. Mo means pot, and Hom is the name of a plant that gives indigo blue color. It is well-known as natural-dyed clothes that has unique blue color.

Mohom originally came from *Laotians (Thai Puan)* and *Thai Lue*. Two centuries ago, some of them moved to Tung Hong where became the biggest marketplace of Mohom in later. Mohom was popular in laborer class, and became widespread because of its low price and its durability. It was usually weaved with the traditional loom, and had plain style. Later, Mohom has been adapted to be more fashionable to attract young customers, and the dressmakers tend to buy complete clothes from factories instead of weaving by themselves. That makes the price of traditional weaving clothes go up so high. Moreover, there are many shops that use chemical dyeing color instead of the natural one. However, natural dyeing color is still used widely since it gives more beautiful color and doesn't smell.

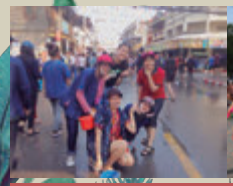
Nowadays, Mohom is noted as Phrae local identity. People usally wear Mohom to work or to attend some festivals such as Songkran day. Many schools have their student wear Mohom on Friday. Aside from clothing products, Mohom can be found as keyrings, keycovers, pillows, bags, etc.



Mohom in classic style

Mohom in fashionable style

hat and keycovers



People wearing Mohom on Songkran day

Making of Mohom

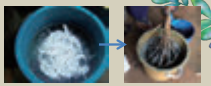
Making of dyeing color

materials & tools

1.concentrated lye(from filtering water with ashes)
2.Hom or Indigo braches and leaves (color source)
3. Water from washing rice
4. Lime (CaO)
5. tamarind juice
6. Pots
7.paddle

1.tie Homs into small bundles, soak them in pots or buckets for 72 hours. After 3 days, water will turn to dark green, take out the pieces of Hom that don't decay.

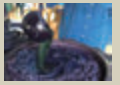
2.Dissolve lime, beat until bubbles occur on the surface. Then continue beating until the bubbles disappear.



3.Filter the water to get Hom sediment or leave it a night for sedimentation.

4.Pour lye into a huge pot (ratio of lye and Hom sediment is 2 L: 1 kg), put all the mixture in(Hom sediment, tamarind juice, lime, Water from washing rice.) Stir until the mixture is well-mixed.

5.Dip the mixture and pour it down. Do it every morning and evening for 3-5 days. When blue bubbles occur on the surface and don't disappear , the mixture is ready to be used.



Clothes Dyeing

materials & tools

1. unbleached cotton fabrics or clothes
2. basket
3. gloves

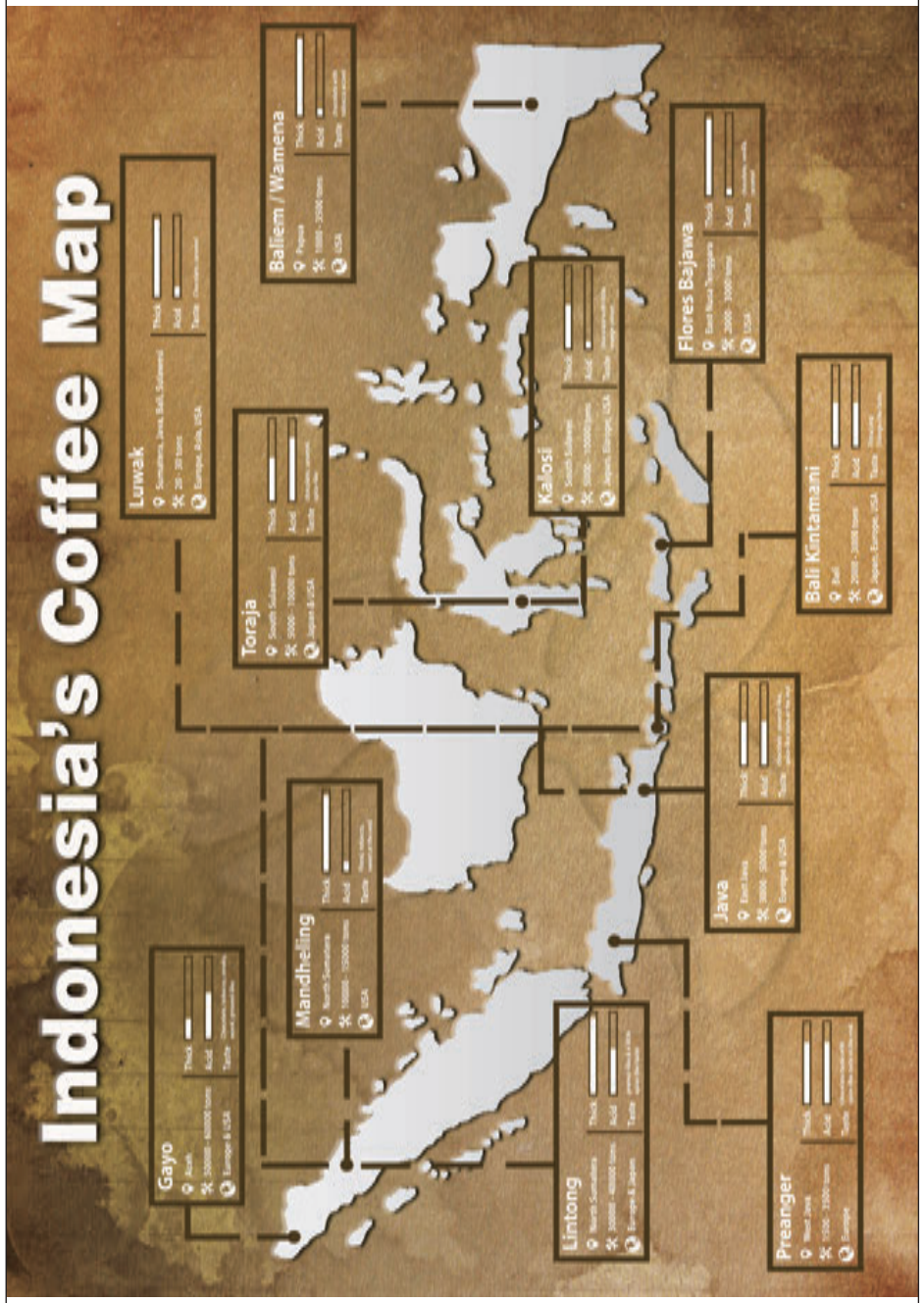
1. wash unbleached cotton fabrics or clothes with water to clean off dusts.

2.Put a basket in the jar. Then put damp fabrics or clothes into the basket(one piece only.)

3.Wear gloves, press the fabrics or clothes until they're all covered, squeeze until they are fully wet.

4.Dry in the air, repeat the 4 steps for 4-6 times.

Photo credits : map: discoverythailand.com(homepage on the Internet). Thailand Destination. [cited 2018 Jan 5]. Website: http://www.discoverythailand.com/des_north.asp. | Making of dying color step 1: [illegible] [cited 2018 Jan 5]. Website: https://sites.google.com/site/phayxrithram. | step 2&5 Triptrawatjang. [illegible] [cited 2018 Jan 5]. Website: https://www.youtube.com. | step 3: [illegible] [cited 2018 Jan 5]. Website: https://soranutboonchan.wordpress.com | step 4 : tudsinjai.com [homepage on the Internet]. [illegible] [cited 2018 Jan 5]. Website: http://www.tudsinjai.com/blog/pann/hom_indigo. | Clothes dyeing step 3: 619 Foto. [illegible] [cited 2018 Jan 6]. Website: http://stepmohom.blogspot.com.

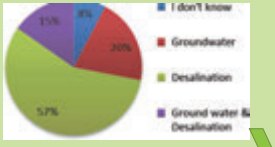


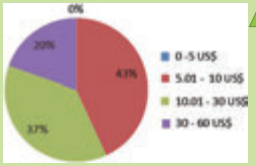
HUMAN BEHAVIOR TOWARDS DOMESTIC WATER CONSERVATION EFFORTS

What is the problem ?

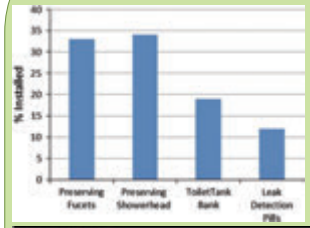
- Lack of domestic water
- Needs and availability are not balanced
- Unsustainable man behavior
- Desert climate

The Data

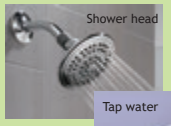


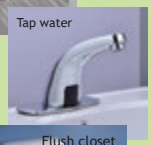


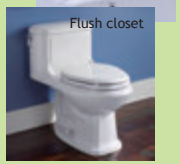
What is human do ?



- Water-friendly campaign
- Tax pay policy
- use of household friendly water appliences







Conservation practice	Yes, % (frequency)
I make sure that taps do not drip	98 (1467)
I use minimal water for cleaning	90 (1342)
I only use the washing machine when it is full	89 (1331)
I strictly adhere to water restrictions	88 (1312)
I take shorter showers	88 (1311)
I have a dual flush toilet	87 (1295)
I do not hose my driveway	86 (1290)
I minimise toilet flushing where possible	85 (1286)
I use water efficient showerheads	82 (1230)
I only use the dishwasher when it is full	81 (1205)
I rarely water the garden	77 (1155)
I use water efficient taps	76 (1140)
I have a drought tolerant /low water consumption garden	74 (1109)
I use a water efficient dishwasher	64 (957)
I use a water efficient / front loading washing machine	50 (752)
I do not wash my car with water	50 (744)
I collect water from shower/sink/bath for use elsewhere	47 (705)

Appliance	Yes, % (frequency)
Dual flush toilet	87 (1302)
Water efficient showerhead	82 (1225)
Water efficient washing machine	75 (1124)
Water efficient taps	74 (1109)
Hot water insulation	62 (927)
Water efficient dishwasher	58 (868)
Tap/hose timers	43 (639)
Water collection system for sink/washing machine/shower	41 (611)

Dolnicar 2010; Ouda et al. 2013; Habi et al. 2015

GRAPHENE OXIDE SYNTHESIS FROM SPEARGRASS (*Imperata cylindrica*)

M. Ilham Bayquni 13312041
I Putu Darma R. 13312098

Supervised by :
Prof. Ir. Bambang Sunendar, M.Eng., Ph.D. | Elsy Rahimi Chaldun, M.T.

Introduction

Indonesia is one of the country with the highest biodiversity in the world. It has abundance of biomass that could be thoroughly explored especially for advanced material research and technology. One of biomass with high cellulose content, namely *Imperata cylindrica* otherwise known as speargrass, is potentially used as a carbon source to synthesize graphite and graphene.

Graphite is an allotrope of carbon with the trigonal sp^2 bonding, which is composed of series of stacked parallel layer planes. Within each layer plane, the carbon atom is bonded to three others with strong covalent bond, forming a series of continuous hexagons in what can be considered as an essentially infinite two-dimensional molecule. While, much weaker van *der Waals* bond exists between each layer.

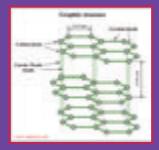
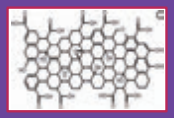


Illustration of Graphite Structure[1]

Graphene is a single–atom thick sheet of sp^2 hybridized carbon atoms arranged in a hexagonal lattice. Graphene oxide is graphene with the interruped aromatic lattice by carboxylic (COOH) groups at their edges, and also epoxides (C-O-C), alcohols (-OH), and ketone carbonyls (C=O) groups on the basal planes.

Modified Hummers method is used to oxidize and exfoliate the graphite to obtain graphene oksida (GO). Strong acidic solution such as $H2SO_4$ and HCl, also other strong oxidation agent, such as $KMnO_4$ and KNO3, are utilized in this process.

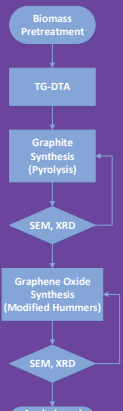


Chemical structure of Graphene Oxide[2]

Goals

1. To compare the structure of graphite and graphene oxide obtained from speargrass;
2. To determine the optimum temperature and holding time of pyrolysis of speargrass to obtain graphite;
3. To compare the structure and morfology of graphene oxide obtained via modified Hummers method.

Materials Synthesis



Graphene oxide (GO) is synthesized using speargrass obtained in Bandung-West Java as the carbon source. After dried for a while in the oven at 60ºC, the speargrass is converted into graphite via pyrolysis method. Previously, the temperature of pyrolysis is determined by the TG-DTA against the speargrass under an inert gas, Argon. Then the obtained graphite is converted into GO via a chemical exfoliation method, modified Hummers.

Then, the graphite and GO variations were characterized using XRD, obtained peak at 2θ ≈ 26.5º, 43º and 45º which assigned to (002), (100) and (001) graphite and GO planes respectively. SEM image of graphite and GO showed the porous morphology of the carbon. SEM image of GO also confirmed the peaks obtained from XRD .

Table 1 Variations of Graphite

Holding Time | Temp.	660ºC	860ºC
2 hours	G_1	G_3
4 hours	H_1	H_3

Table 2 Variations of Graphene Oxide

Variations	Grafit	GO
2 hours, 860ºC	G_3	Z_1
4 hours, 860ºC	H_3	Z_2

Conclusion

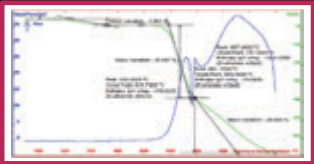
1. Amorphous graphite has been obtained via pyrolysis of spear grass. Graphite partially converted into GO via modified Hummers method. SiO_2 still exist on the carbon obtained.
2. Among the variables chosen in this research, the optimum temperature and holding time of pyrolisis to obtain graphite from spear grass is 860ºC and 4 hours, respectively.
3. Comparation between obtained GO :
   - Z_1 has higher degree of crystallinity than Z_2
   - Z_1 and Z_2 have identic porous morphology

Recommendation

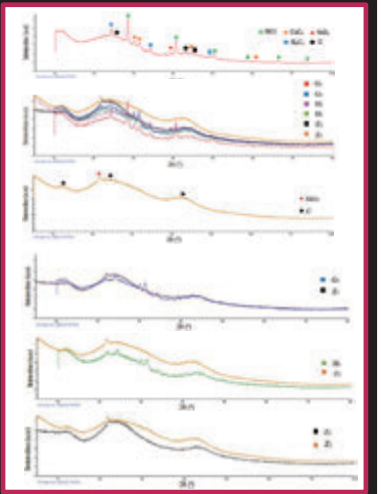
1. Crystallinity of the carbon might be increased by using proper catalyst, such as Fe, Ni.
2. FTIR has to be done to confirm the XRD pattern, and also to prove the functional groups of GO.
3. TEM and BET are needed to find the crystal orientation and the surface area of the carbon, respectively.

Materials Characterization

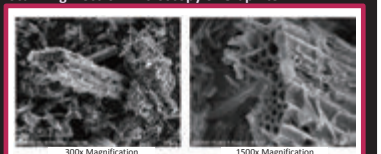
Thermo Gravimetric-Differential Thermal Analysis



X-Ray Diffractometry

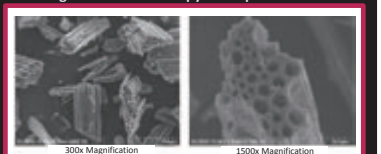


Scanning Electron Microscopy of Graphite



300x Magnification 1500x Magnification

Scanning Electron Microscopy of Graphene Oxide



300x Magnification 1500x Magnification

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Image source

[1]http://www.substech.com/dokuwiki/lib/exe/fetch.php?cache=cache&media=graphite_structure.png
[2]J. Guerrero-contreras, "Graphene oxide powders with different oxidation degree , prepared by synthesis variations of the Hummers method," *Mater. Chem. Phys.*, vol. 153, pp. 209–220, 2015

The Role of Dietary β-carotene in Human Health : Literature Review

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INTRODUCTION

A variety of plant components such as fiber, carotenoids and other phytochemicals are thought to contribute to these protective effects.[1] Carotenoids are red and yellow fat-soluble pigmen found in many fruits and vegetables. The major carotenoids that have vitamin A activity in human plasma are β-carotene, α-carotene and β-cryptoxanthin.[2] β-carotene has been termed the most active of the carotenoids due to its higher provitamin A activity.

DISCUSSION

Dietary Intake of β-Carotene

β-Carotene is a commonly consumed plant pigment. Dietary sources of β-carotene include orange and bright green vegetables, such as carrot, sweet potato, pumpkin, broccoli and cabbage, as well as other foods like red palm oil and also vitamin supplements. β-Carotene in orange fruits and vegetables appears to be better absorbed and utilized, or more bioavailable, than β-carotene in leafy green vegetables.[3]

Table 1. Dietary Source of Carotene

Source of β-Carotene
Carrots
Sweet potatoes
Pumpkin
Broccoli
Spinach
Cabbage
Red palm oil
Supplements

The β-carotene median intake of Indonesian society (14.95 μg/day) is lower than other studies in Bogor at 297.00 μg/day and 4.074.20 μg/day and in Spain at 1678.60 μg/day Dietary sources of β-carotene which are consumed subjects include sweet potatoes, spinach and carrots.[4] It should be mentioned that data for total and individual carotenoid intake obtained from different studies are difficult to compare due to differences in methodological approaches and the purpose of data collection. Methods of dietary assessment can be divided into records (weight of food eaten) and recalls (diet history, the FFQ (Food Frequency Questionnaire) and the 24 hour dietary recall).[5]

Absorption, Metabolism and Transport of β-Carotene

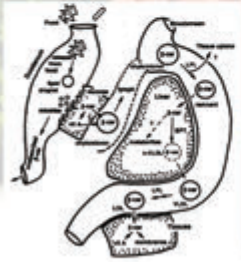

Figure 1. Absorption, metabolism and transport of β-carotene[6]

Plasma β-Carotene

Dietary intake of β-carotene (vegetable and fruit) have been consistently associated with plasma carotenoids (β-carotene) in observational studies. High performance liquid chromatography (HPLC), which is considered the gold standard analytical technique for analysis of carotenoids. Results from the meta analysis indicate that the weighted mean plasma β–carotene 0.47 mmol/L. In the sub-analysis by sex, females had higher (not statistically significant) plasma concentrations of β-carotene compared with males ranging from 1 to 7% higher.[7] Plasma β-Carotene concentrations may be influenced by various dietary factors potentially affecting β-Carotene absorption and metabolism.[8,9]

Table 2. Factors influencing absorption and metabolism of β-Carotene

Consumer specific characteristics (e.g. metabolism and absorption limit)
Dose
Dietary fat intake
Vitamin A status
Food matrix
Food preparation and processing
Other carotenoid present in meal

β-carotene for Health and Disease

Epidemiological studies have reported that regular consumption of fruits and vegetables as source of β-carotene have been associated with decreased risk of non-communicable disease.[10]

Tabel 3. Potential health benefit of β-carotene

- Antioxidant (protect against free radicals)
- Reduce the risk of developing cancer, cardiovascular disease, diabetes mellitus
- Immune function
- Play an important role in the control/reduction of body fat
- Provitamin A activity
- Gap junction communication

CONCLUSION

The major public health benefits could be achieved by increasing consumption of β-carotene rich fruits and vegetables.

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Acknowledge :
Thanks to LPDP (Indonesia Endowment Fund for Education)

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THINCLE TRIAL COURSE PROGRAM
February 8th - 20th 2018, Chiba, Japan

Screening of Rhizosphere Actinomycetes as Bioprotectant on Soybean Plant

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ABSTRACT

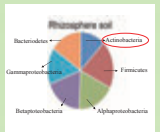
Soybean is the big three of the main food after rice and corn in Indonesia. One of the reasons that causes decreasing in soybean production is pathogenic fungi. Soilborne pathogenic fungi such as *Fusarium oxysporum, Rhizoctonia solani,* and *Phytium* sp. have been known causing rotten and damage of soybean root. Indigenous microbes which are isolated from soil infected by pathogenic fungi have been recognized having important role in suppression the disease. Rhizosphere actinomycetes is good candidate for bioprotectant because of its large amount in soil and broad range of bioactive compound. Previous research resulted 20 rhizosphere actinomycetes isolates from soybean plant which are potential as growth promotor. This research aims to analyze the antagonism activity of rhizosphere actinomycetes isolates toward three pathogenic fungi. Two isolates coded ARK 92 and ARK 94 show the antagonism activity toward three pathogenic fungi by dual culture method. Hypersensitivity test was used to convince the ability of two isolates as bioprotectant. The test showed there was no necrosis in tobacco leaves caused by isolates. This research proved the rhizosphere actinomycetes can be bioprotectant toward pathogenic fungi on soybean plant.

INTRODUCTION

Soybean and Soilborne Pathogenic Fungi

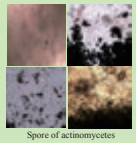
- Soybean production in Indonesia decreases because of soilborne pathogenic fungi. Indonesian ministry of agriculture in 2015 stated that soybean productivity was less than 1,5 ton/ha. BPS confirmed in 2016 that soybean production decreased in 2015. BPS emphasized that Indonesia also imported appoximately 2,3 ton of soybean or increased about 38% in 2016.
- Soilborne pathogenic fungi that mostly involve in soybean plant such as *Aspergillus niger, Aspergillus flavus, Fusarium* sp., *Penicillium* sp., *Cladosporium* sp. *Sclerotium rolfsii, Rhizoctonia solani, Pythium* sp. *Phytopthora* sp., and *Rhizopus* sp.

Actinomycetes of Soybean Rhizospere as Bioprotectant



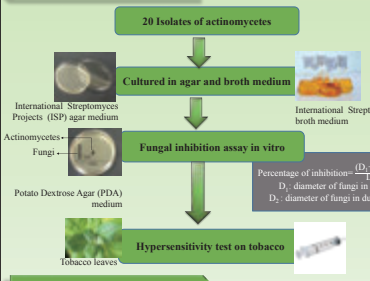
70% of bioactive compound in bacteria founded in actinomycetes

Actinomycetes in International Streptomyces Projects (ISP) agar medium



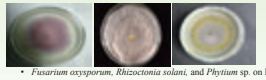
Spore of actinomycetes

METHODS

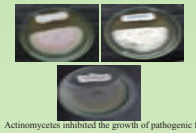


RESULT

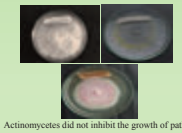
Antagonism activity between actinomycetes and pathogenic fungi



- *Fusarium oxysporum, Rhizoctonia solani,* and *Phytium* sp. on Potato Dextrose Agar medium.



Actinomycetes inhibited the growth of pathogenic fungi



Actinomycetes did not inhibit the growth of pathogenic fungi

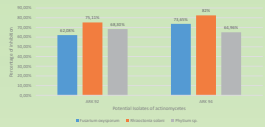
Table of potential isolates of actinomycetes against pathogenic fungi

Isolate number	*Fusarium oxysporum*	*Rhizoctonia solani*	*Phytium* sp.	Isolate number	*Fusarium oxysporum*	*Rhizoctonia solani*	*Phytium* sp.
ARK 13	√	x	x	ARK 86	√	√	x
ARK 16	√	x	x	ARK 87	x	√	x
ARK 17	√	√	x	ARK 91	√	√	x
ARK 26	x	x	x	ARK 92	√	√	√
ARK 28	x	√	x	ARK 94	√	√	√
ARK 47	x	x	x	ARK 103	√	√	x
ARK 48	x	x	x	ARK 108	x	√	x
ARK 51	√	x	x	ARK 116	x	x	x
ARK 63	√	√	x	ARK 143	x	x	x
ARK 68	√	x	x	ARK 49	x	x	x

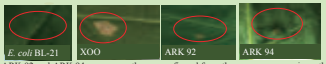
√ : isolate had antagonism activity x: isolate had not antagonism activity

- Each actinomycetes has various ability in inhibit pathogenic fungi.
- Isolates coded ARK 92 and ARK 94 had the ability to inhibit all of pathogenic fungi.

Inhibition percentage of antagonism activity



Hypersensitivity test



ARK 92 and ARK 94 were nonpathogen confirmed from there was no necrosis on the plant tissue. Positive control using *Xanthomonas oryzae* (XOO) and negative control using *Escherichia coli* BL-21.

CONCLUSION

Actinomycetes isolates have potential to inhibit the growth of pathogenic fungi. Two isolates have an ability to inhibit growth of *Fusarium oxysporum, Rhizoctonia solani,* and *Phytium* sp. The potential isolates are nonpathogen convinced by hypersensitivity test. Further researchs are needed to point out the mechanism of inhibition, bioactive compound, and genetical structure.

ACKNOWLEDGEMENTS

This research was funded by LPDP (Lembaga Pengelola Dana Pendidikan) from Indonesian Ministry of Monetary.

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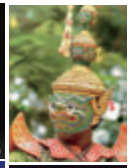
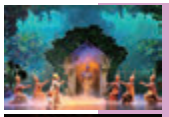
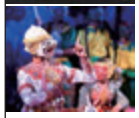
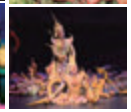
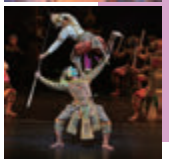
THAI PERFORMING ARTS

KHON

Khon is Thailand's classical, high art form of performance that dates back to the Ayutthaya era in Thai history. Khon is a mask dance drama in which the dancers wear masks and carry weapons while dancing to the accompaniment of So (Thai fiddle) and other musical instruments.

Khon performance can be presented in various occasions, for example, during religious ceremonies such as the funeral ceremonies of royalty, dignitaries or well-respected persons.

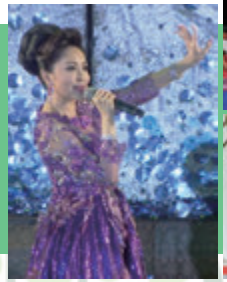
Khon integrates elements of several art forms into an artistic whole. In addition to its artistic value, Khon also provides food for thought, maxims, morals and ethical values that the viewers can apply in their daily life.

MO LAM

Mo Lam is the traditional art of singing folk songs and performing folk spectacles of the Northeastern people.

Mo Lam is a narrative singing–singing about folk or religious stories. The verses are accompanied by a khaen (a kind of reed mouth organ). The stories are taken from literature, for example, Karaket, Sinchai tales from the Jataka tales (tales from the Jataka or Buddhist Sacred Scriptures).

Mo Lam serves the community's way of life and has significant entertainment value to the community. It is the repository of stories, adages, wisdom and philosophy of the northeastern communities that have passed down through generations.



HUN KRABOK



Hun Krabok originated in the reign of King Rama V by adapting the Chinese puppet theatre from Hainan.

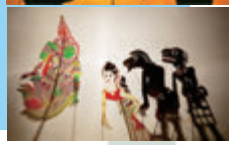
The bamboo puppet theatre originated in the northern provinces of Sukhothai, Uttaradit, and Nakhon Sawan.

Bamboo puppet presentation imitates the Lakhon Ram (dance drama) by adapting the human dance movements to suit the puppets. The basic dance movements for the puppet show are: Klom Na, Krathop Changwa, Thaeng Mue, Ti Bot and Ram Phleng. The puppeteers must practice these movements until they are highly skilled. They must also deliver the dialogue. The clowns help progress the story and make it lively and fun to watch.

NANG TALUNG

Nang Talung is a folk shadow puppet spectacle of the southern region of Thailand. It is a very popular kind of entertainment.

Besides its entertaining value, Nang Talung's lasting popularity from the past to the present also rests on the sharp wit of the puppeteer who comments on the prevailing social occurrences and happenings through the puppets. This reflects the character of the southern people who are keen on following social and political development and occurrences in the nation. Nang Talung has therefore been a part of the social and cultural landscape of the southern people throughout the ages.

Future of the education

What the modern education for?

•People who interest to learn something.

Nowadays, intuition need to increasingly concern about it could be a major change in external factor which cause the institution to change as well.

• Ensure that they are qualify to work when they earn certificate.

In fact, some people attend higher education in order to achieve and earn the certificate for apply to work that qualify to the license. This mean education qualify will be necessary for job security and job application as well .


Modern trend education

1. Demographics change

The changing in the aging of people will cause long term issue with the education system because the gap of people who join the class will have very different characteristic such as aging gender and knowledge background.

Moreover, the lecture will need to adopt the teaching style that suitable with the diversity group.

2. Urbanization

At this point, the number of population in the city have been slightly increasing. The possible reason seem to be the education system and job opportunity at the capital city. This cause the number of people in the outside the capital city to decreasing.

This would cause the local community outside the city to suffer with not only the low work force but also no person who could develop or improve the small community to have a better quality.

This trend is the education policy my need to concern that they should have a high qualify teacher at the rural area.

3. Disruptive technology

In the 20 century, the technology innovation have become more convenient in many way such as communication, socialize and information research.

In this case, the lifestyle of new generation may reline on the technology more than in the past. Therefore, the university level need to concern about "How people use current technology?" because the university also need to improve and create suitable atmosphere for learning.

4. Specialization

The school need to consider about the subject in particular because there are many work area that have high demand for specialize subject for example, in the past people consider study MBA course while present time we possible have MBA for SMEs, Etc.

5. Education policy

From this point of views we also consider the policy that would ensure the quality of internal (system, employees and students) and external factor (economic and technology). The reason is there are some university around the world that have to cancel paper or shut down because the lack of improvement or the quality of the university does not meet the standard of the government.

6. Non-formal/ Alternative Education

Nowadays there are many alternative education that not only could affect the participant life style but also institution. For example, online learning subject can be study anywhere that have the internet connection. In this case, the higher education could or possible provide certificate for the participant. On the other hand, there is a home school that parent could teach their child or hire tutor to educate their children. This may cause university to concern about the setting of their education system like "what is the demand of the participation and person who support them?", "How do we make the education fit with their lifestyle and demand?"

What is the need for the future of higher education?

☒Need to secure quality.

There area that they need to concern is the quality of Human resource department because the need for the interaction in education system by managing performance of the teacher.

☒Who is our participant?

For higher education is possible see that at the end generation X (1991-1999) possible the target for higher education.

On the other hand the beginning of generation Z (around year 2000) are start to go to attend higher education.

We need to understand them and set the programs that suitable with their characteristic.

☒Diversity group

Nowadays, there the modern technology would help people in many different way which make gap between people come closer. Therefore, it may not only about culture that higher education need to consider but also the method of teaching the people in different background or the cooperation in the group of diversity.

☒Equality

We can see that many aspect become closer such as gender, disability, and aging.

Therefore, the demand of each aspect would be mix as well. For example, the gender education need to be suitable at the time of study.

Another example is the facility need to be suitable for people who possible cannot see or walk.

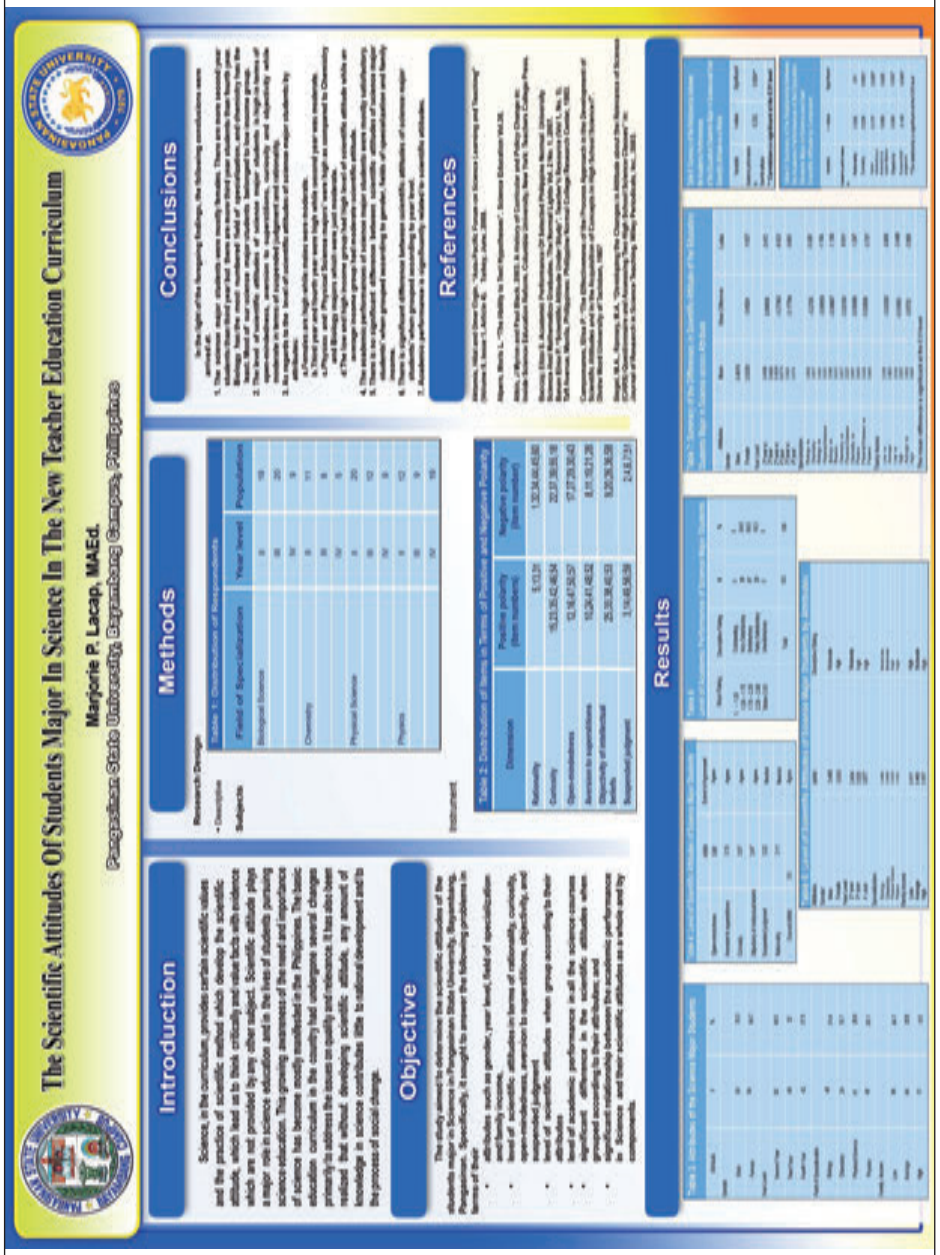
VIETNAM NATIONAL UNIVERSITY, HANOI

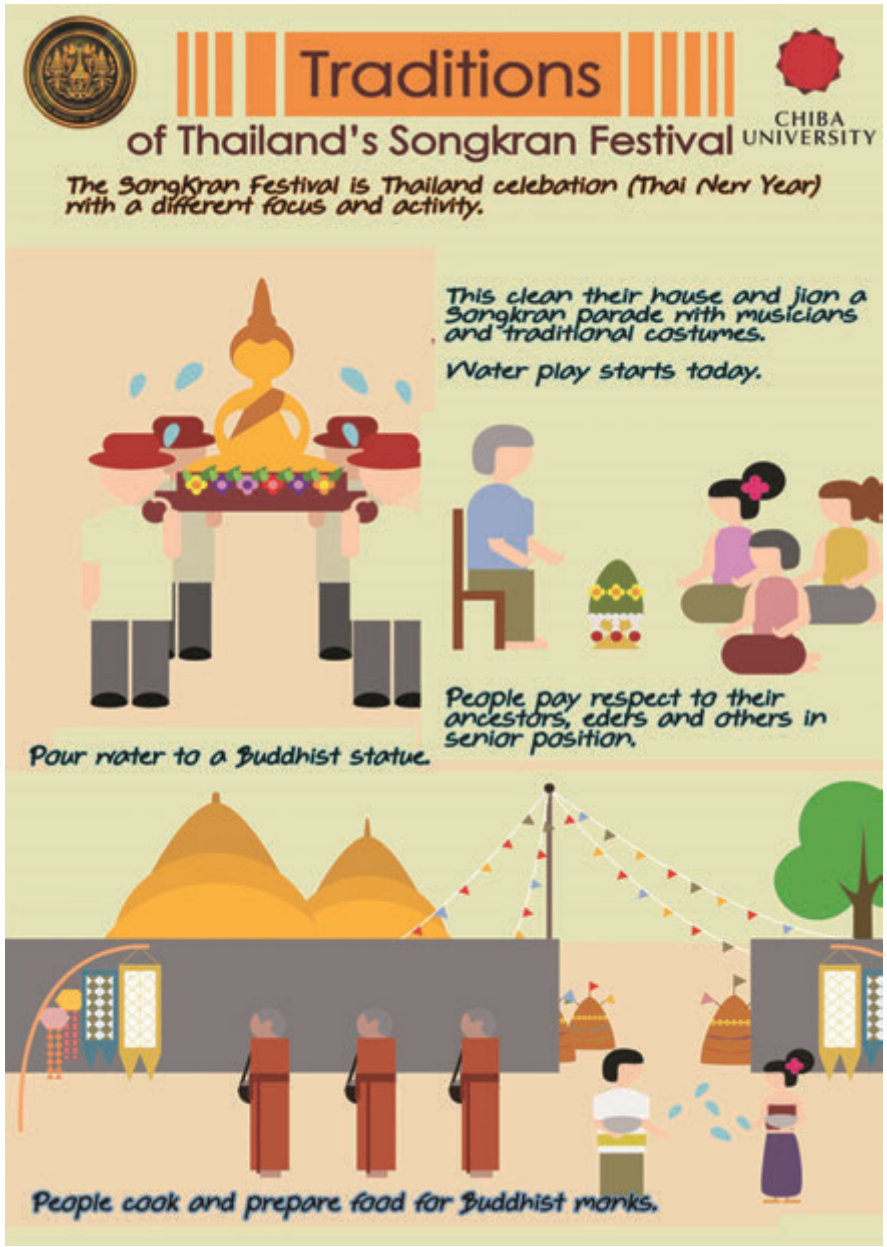
VNU UNIVERSITY OF EDUCATION

TWINCLE 2018

Dù ai đi ngược về xuôi

Nhớ ngày Giỗ Tổ mùng mười tháng Ba





TWINCLE UnitA

Engineering:Yasuhito Watahiki
Education:Chiaki Ogata,Hikaru Sano,Hina Morishige

King Mongkut's University of Technology Thonburi,Chulalongkorn University
August 15 – August 25 2017

Science Lesson <SEE YOUR OWN DNA>

Contents:
- explain what is DNA
- experiment extracting DNA
- Japanese culture activity (Origami and making Uchiwa)in waiting time of the experiment
- introduce a new technology of DNA

Good points:
- Many students enjoyed and succeeded in the experiment
- Students and TWINCLE members talked about each other's country
- Many students were interested in Japanese culture and enjoyed Japanese culture activity
- Although there were some troubles, we solved them with Thai students' help

Bad points:
- It was difficult for many students to use pipettes(That was the first time for them).It was better to show them how to use pipettes by demonstration


Japanese Culture Lesson <TapTap Sumo>

Contents:
- Japanese traditional game"TapTap Sumo" (Introduction, making Sumo dolls and playing game)
- decorate Uchiwa with Japanese Character


Students enjoyed the activities, for example they TWINCLE members how to write their name in Japanese. Because the class was Japanese class, our lesson could attract their interest.

Thai Culture

- food
- language
- traditional dance
- cook sweets
- visit historical places

Through Thai culture lessons and life in Thailand, we felt many differences and some similarities between Thailand and Japan.
We also learned old relation between Thailand and Japan.

Conclusion

Achievements:
- We learned and experienced Thai life and culture
- We felt many kindness of Thai friends and we thoughtwe should try to do same things for foreigners in Japan


Improvements:
- more English skill(speaking, listening)
- promotes international understanding
- more research about Japanese culture


TWINCLE UNIT B

Kenta Yamada 
Rina Miyahara 
Fumino Uehara 
Ayako Tsuchiya 

king Mongkut's University

Thai Language and Culture Class

What we learned

- Introduction to Thai language
- Thai Alphabets
- Tones
- Greeting
- Useful phrases
- Dos and DONTs in Thailand
- Eating culture
- Regional food
- Holiday and Festivals
- Making Kratong

44 consonant Symbols
21 Sounds
It was very difficult :-O

We had so much unknown things, so we're interested in anything.


Ayutthaya

We went to Wat Phra Sri Sanphet and Wat Mahathat. We came in to contact with the history of Thai. And we rode elephants.

Bangnamphung Floating Market

We saw some fruits which we had never seen before.

BANG PA-IN PALACE

We saw some beautiful buildings, gardens and temples. Many foreign cultures coexist there.

Chulalongkorn University

Museum Tour

Zone 1 The Chamchuri Sapling-towards a land of wisdom and intellect
Zone 2 The Chamchuri Stands Tall
Zone 3 The Chamchuri Branches Out
Zone 4 The Chamchuri blossoms

Natural History Museum Tour

I was surprised that there is such a big museum in the university.

It was a lot of fun to see a lot of exhibits!!

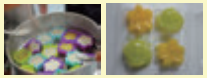
Khon and Thai Language

What I learned about Thai traditional dance (Lakhon ram) was impressive

We were treated to Sticky Rice and Mango:->

Thai Cooking Class

We cooked kanom chan. They were so delicious because of bouncy.



Science lesson

We taught a class at Churalongkon high school and Satriwitthaya high school . In the class, we taught about what DNA is by projecting slides and did an experiment every table.

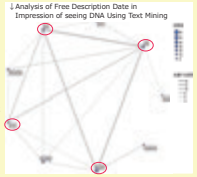
Lesson『See your own DNA』

Topic

1 .What is DNA.
2 .Describe an experiment to see your DNA and do the experiment.
3 .Recent DNA technology.

Realizations

Most high school students in the class hadn't seen their own DNA . So ,they had very good impression about the experience of observing their own DNA. (→)
It was so difficult to teach a class to high school students who spoke other language for us. In the preparation step,we had many difficulties that we suggested how to tell in a straightforward manner and teach a class merrily. However, we could teach a class to Thai high school students barely and get confidence. Above all, we enjoyed communicating with high school students very much.



Experience

Japanese Culture Class

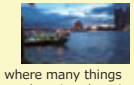
- Write student's favorite Chinese characters on the fans and make their own fans.

- The toy of the Sumo :Experiences of Tap Tap Sumo

- Introduce Japanese famous exercise : Radio exercise

Asiatique The Riverfront

Town of warehouses on the banks of the Chao Phraya.




There are many shops where many things were sold. We could not only enjoy shopping but also see some beautiful landscape.

Finally

We met Thai friends and teachers in Thailand. I got so much out of this experiences.

I hope to make use of this learning in the future and further deepen cross-cultural communication.

Twincle 2017
Date: 15-26/8/2017
@Mahidol University, Kasetsert University

Twincle in Thailand

UnitC
Kohei Takayanagi
Akane Saito
Ayano Sasaki
Moe Mizutani

Science Class – See Your Own DNA –

Introduction


Object
・To introduce ourselves, Chiba Univ and Japan.
・To know each other and make students in relax

What we awared
・Using the character of Manga.

Impression
・Using familiar topics, Manga, Anime, was good to communicate with student and helped to keep their attention.

Experiment


Object
・To understand feature of the DNA.
・To understand how to see the DNA and procedure of experiment.

What we awared
・Give some task to figure out what they are doing.

Impression
・Most students could understand the mechanism of experiment.
・They looked excited when they found their DNA. Almost all of students succeeded.

Biotechnology

Object
・To let them know more about DNA.
・Introduce biotechnology relating to DNA and the example of using biotech.

What we awared
・Explain the procedure and meaning of each step.

Impression
・Student understood what we talked about well and get interested in the biotech.

Comments from students
・This class make me want to learn more.
・I'm interested in DNA.
・Need to change some English word more understandable.
・Easy to understand.
・Interesting and not boring than learning only by book.

What can we do to improve
・We need to improve English skill in order to speak easily and understandably.
・A few steps were a little hard for them. (e.g. The steps of protease.) It might be good to explain carefully and take longer time on difficult topics.

Culture Class THAI ⇔JAPAN

Japanese culture class

We had some classes about Japanese culture. We taught Japanese traditional games like kendama, origami and kanji.
They seemed to enjoy our classes so much.





We gave Thai students Japanese name that we thought from their Thai name. They looked so exciting!

We explained about Japanese language. There were many students who is interested in Japan!

Teaching how to make "shuriken" with paper that called "origami". *Shuriken* is a tool of ninja! We also folded paper crane.

Let's challenge *kendama* – Japanese traditional toy! That might be too difficult to master only a few minutes...

Thai culture

Thai students also taught us about Thai culture; Thai traditional dance, how to make Thai foods, and so on.

This is the "chicken salad" we made!! It looked beautiful and tasted so good.

Frying shrimps to cook patthai

We tried Thai dance wearing Thai traditional costumes.

Thai popular sweets made of eggs. They were so sweet and delicious.

Our Weekend

8/19 PM Wat Don Wai Floating Market

- There ware colorful dishes and grilled duck.
- We enjoyed some traditional Thai foods on the ship.

8/19 PM Chatuchak Weekend Market

- The market was very large and various Thai traditional items were on sale.
- We enjoyed shopping for a long time.

8/20 Wat Arun

- It is a temple representing Bangkok.
- There were so beautiful white buildings.

8/20 Wat Pho

- It is the oldest temple in Bangkok, there is a golden Buddha.
- We were surprised at the size of statue.

8/20 Golden Mountain

- From the top of this temple, we can see the city of Bangkok.
- The stairway to the top was long and we got tired a bit but the view was so great.

TWINCLE PROGRAM IN THAILAND

CHIBA UNIVERSITY

UnitD Menber: Ayane Kawashima, Rio Ogawa,
Chika Nishikawa, Keigo Yoshidomi

SCHEDULE

Date	Day	Activity
15.Aug	Tue	Arrival in Thailand
16	Wen	Meeting Tour of Siriraj Hospital & Medical Museum
17	Thu	Science Class ①(Nawaminthrachinuthit Satriwitthaya Phutthamonthon School)
18	Fri	Thai language Class Japanese culture Class
19	Sat	Sightseeing(Don Wai Floating Market, Jatujak Weekend Market)
20	Sun	Sightseeing(Wat pho, War phra Kaew, Siam Square)
21	Mon	Meeting
22	Tue	Science Class ② (Satrinonthaburi School)
23	Wen	Thai culture Class
24	Thu	Final Presentation
25	Fri	Free time
26	Sat	Arrival in Narita

SCIENCE CLASS

We gare lesson of science at two high schools.
The theme is "See your own DNA", the experiment is to take out cells which is in cheek.

We have prepared hard before departure, and then tried to make class which is easy to understand and enjoyable.

The students of highschool gave us impressions.

They said, "Teachers are kind.", "It's the first time to see my own DNA." and so on.
We were nervous because we taught in English, but we could finish without incident.

JAPANESE CULTURE CLASS

In Japanese class, we taught Origami and Kendama to Thai students and told Kanji of students' own name.
They enjoued playing Origami and Kendama.

And, they were very pleased with their own name of Kanji.

SIGHTSEEING

The students of university took us some tourist spots after the class of experiment and holiday.
We were surprised at the buildings we have never seen before.
Especially, the lying statue of gold was bigger than we imagined.
Also, the prices of thai is different from that of Japan, so we bought a lot of souvenirs.
Every spot and building became precious memories for us.

THAILAND CULTURE

Both Mahidol university and Kasesart university welcomed warmly.
We were taught how to make thai traditional dishes.
Some dishes of Thai were spicy for us, but we found that there are many delicious dishes in Thai.

In the class of Thai dance, we wore nice custume, and danced pleasantly with music pecular to Thai.

FINISHED THE TWINCLE

At first, we had some anxiety about twincle program.
However, thanks to twincle member, twincle office, and teachers and students in Thailand, we spent enjoyable and full days.
This experience will make us more grow up.
I'd like to appreciate everyone. We love Thailand !!

Humanities and Social Science　Poster No.31-No.48

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50	Japanese Ramen for Muslims!	Chiba Prefectural Sakura High School	ITAYA Sawa	SASSA Hideki	KOSAKA Yume	OKAWARA Shu
			IGARASHI Yuna	KANEKO Kentaro		
51	Think Globally, Act Locally	Chiba Prefectural Kokubun High School				
52	What is "Seishun"(youth)	Shibaura Institute of Technology Kashiwa High School	YONEJI Kanon	NOGUCHI Yui	OIKAWA Tomomi	IWATA Rina
53	ESD of Sakuragaoka	Chiba Prefectural Sakuragaoka High School				
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55	Activity Rreport　Education for Sustainable Development	Ichihara Chuo High School				
56	The Problem of Japan after the World War Ⅱ	Shibaura Institute of Technology Kashiwa High School	YASUNISHI Yuki			
57	Fair trade in the future “Shopping is about voting for the sort of society you like”	Incorporated School Ichikawa Gakuen Ichikawa High School	ISHIDO　Ikoi	SATO　Yuhi		
58	What is Game Theory?	Shibaura Institute of Technology Kashiwa High School	HAYAKAWA Taisei	AKIYAMA Masataka	KITAMURA Kosuke	
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60	Thought Experiment	Shibaura Institute of Technology Kashiwa High School	SAKAMOTO Makoto	TANAKA　Erika		
61	Extreme Weather Events　WHAT IS HAPPENING IN THE WORLD?	Chiba Prefectural Chiba Higashi High School	KOSHIZUKA　Aya			
62	Why did Aum Sinrikyo cause Tokyo subway attak?	Shibaura Institute of Technology Kashiwa High School	SAIKA Kosei	OKADA Shunsuke	SHIOTSUKI Yuto	
63	Panel Discussion	Chiba Prefectural Chiba Higashi High School	TANIZAKI Kanako			
64	Why do human beings travel?	Shibaura Institute of Technology Kashiwa High School	HAGIO Yuta	TIKUDA Jun		
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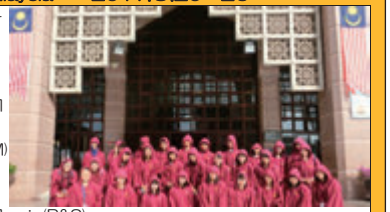
80	Global Leaders from Japan!	Reitaku High School				

KAMAGAYA NISHI HIGH SCHOOL

Chiba International exchange project ～Malaysia～ 2017.8.20～26

schedule

8/20(Sun)・Departure Narita、Arrival Kuala Lumpur
21 (Mon) ・Visit Japanese Embassy
・Visit Putrajaya city
・Cultural experiences(dyeing)
22(Tue) ・Exchanges at a Malaysian local school
23(Wed) ・Visit to Malacca
24(Thu) ・Learning environmental problems(FRIM)
・Visit to Japanese company(DAIKIN)
・Staying in kampong(home stay)
25(Fri) ・Walking with university students in Malaysia(B&S)
26(Sat) ・Departure Kuala Lumpur、Arrival Narita



At National Muslim temple

Preparations

What we have learned

Eye contact

Move and walk

Smile

I learned that the importance of self-expression.

We Talked about Japanese family crests [KAMON], and made a fan of the original [KAMON] together.

Exchange at a local school

What we have learned

Pay honor to the others

Tried to make myself understand

I don’ t speak English well.

But I was able to communicate with others by using simple words and feeling of the consideration.

Kampong stay

What we have learned

Admit to being difference

Understanding myself

I think culture is born from life, so I think it is important to enjoy the life of the other country.
I got a better opinion about our culture, lifestyle, custum.

After returning home ～About our growth and future～

・Continued exchange with Malaysian students.
・To work volunteer activity in my school.
・Took part in English speech contest
・Took part in a presentation of environmental forum.
・Took part in a presentation at SEITOKU university.
・To apply for Indonesia exchange program.

・I want to be a nursery teacher who encourages children with a warm heart.
・I want to be playing an active part all over the world.
・I want to be a person who take initiative.

Japanese Ramen for Muslims !

Chiba Prefectural Sakura High School （A－1） Sawa Itaya ・ Hideki Sassa ・ Yuma Kosaka
Okawara Shu ・ Yuna Igarashi ・ Kentaro Kaneko

～Topic～

We want to create a Halal based ramen using ingredients which are produced in Chiba. We would start selling it in ramen shops around Chiba. Then, Muslims do not have to worry about meals when they come to Japan, because Muslims have restricted diets. We hope that Muslims can enjoy their stay in Chiba.

～Suggestion～

(1)
We will develop a soy based oil ramen stock that Muslims can eat with peace of mind.

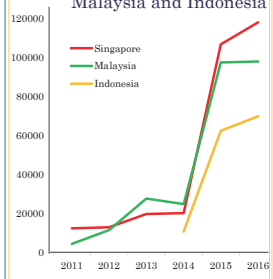
(2)
We will test at college cafeterias (EX: Chiba University & Kanda University of International Studies) and have Muslim students taste-test the ramen.

(3)
We will promote the ramen at existing ramen shops in Chiba.

Chiba Muslim Friendly Ramen

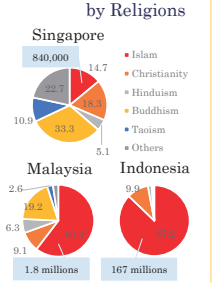
～Research 1～

The Number of Visitors to Chiba from Singapore, Malaysia and Indonesia



RESAS / 2017. Nov.

Population Composition by Religions



Data Book of The WORLD / 2017

～Research 2～

Popular Japanese Foods

	Singapore	Malaysia	Indonesia
1	Ramen	Halal Food	Halal Food
2	Sushi	Fish	Fried Chicken
3	Sashimi	Ramen	Okonomiyaki
4	Tempura	Rice	Ramen
5	Yakitori	Beef	Soft Drink

・This table’s data was collected by a survey of each country using SNS.

Department of Tourism planning, Chiba prefecture

～Research 3～

The Survey in Singapore (Sep. 2017)

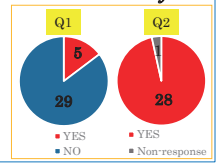
・We could not find any halal ramen shops on Arab Street.
・When we went to Singapore and interviewed the students, they said “There was no halal ramen, but we want to eat ramen”.

～Research 4～

The Questionnaires to Muslim Students from Malaysia

Q1. Have you eaten Japanese ramen ?

Q2. The persons who answered “NO” at Q1 →Do you want to try Japanese ramen ?



～Analysis～

Of Research 1, the number of Muslims tourists in Chiba will increase.
Of Research 2, many people from Muslim countries see ramen as one of the most popular foods in Japan.
Of Research 3 and 4, Muslims do not have a chance to eat ramen.







Kokubun High School

Think Globally, Act Locally

ESD in Kokubun High School is based on three main points.

1. International Understanding
School Trip in Taiwan, Interact with students from other countries or Meros Language School

2. Community Involvement
Local Music Festival, Experience as a teacher at elementary school

3. Environmental Survey
Survey of water quality in Kokubun-river

< What is “Seishun”(youth)>

Shibaura Institue of Technology Kashiwa High School
2-3 Kanon Yoneji Yui Noguchi Tomomi Oikawa Rina Iwata

<Main point>
We research Seishun. Do you know the word? We live in high school days. It is often said “Seishun”. What is the meaning of Seishun ? Seishun is the Japanese special concept that is similar but different to “youth”.
We wonder why the difference is born. So we research it.

・Gathering data & Discussion

・Modern time makes the Seishun?

In premodern:Rite of passage makes children an adult

In modern : Everyone needs knowledges to an adult.

The time is Moratorium by Erikson. He said there are Moratorium man. It is that young people who want not to became an adult.
Also, he said that adolescence is to be able to establish identity or to diffusion of identity.
What is to diffusion of identity?
For example, it is occurred by to loss your dream, to receive the reality shock and over self-conscious.
In a short.... Utu and Neet!!
So, It is important to establish identity.

We must conflict to establish identity.
Conflict is the depth of the frustration and inferiority complex that modern ego.
The Modern ego is the Meiji era`s popular phrase.
The people who make the word is said Souseki Natume and Ougai Mori. His novel, Sanshirou and Seinen, make the vision of Seinen.
The vision affect many people, for example Osamu Dazai and Hideo Kobayashi.

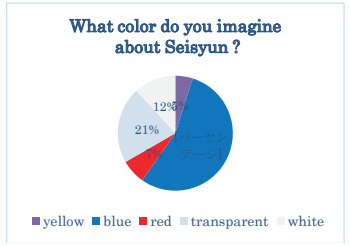
・Seishun is affected by Mass media?

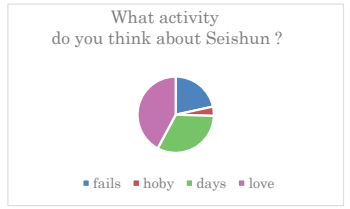
It is often said that Internet make the people personalization and to became over self-conscious.
Over self-conscious? Over self-conscious!?
It is one of the reason why diffusion of identity.
We obviously say Modern society make Seishun.

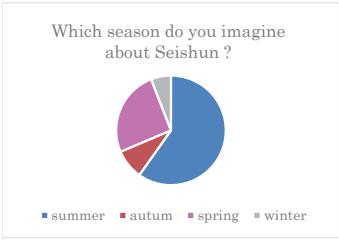


・questionnaire

We take questionnaire in 2017 and we get 103 data.
53 female and 49 man. Age 10 is 81, age20 is 6, age 30 is 2, age40 is 2, age50 is 5 and other.



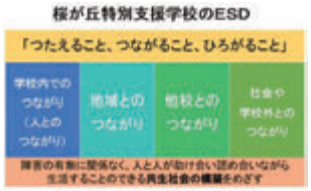




・Female tend to choice summer, man choice spring.
・16% of age10 people choice happiness, but other age people do not choice it.
Thanks for the people answer the questionnaire!

平成２９年度 千葉県立桜が丘特別支援学校ＥＳＤの取組
ＥＳＤ ｏｆ ＳＡＫＵＲＡＧＡＯＫＡ

桜が丘のＥＳＤは**「つながり」**を大切にし、**「共生社会の構築」**をめざして様々な活動に取り組んでいます。ユネスコスクール３年目の今年度は、サステイナブルスクールの活動の取組や、ホールスクールアプローチのプロジェクトの一員に選ばれました。その取組が認められ「ユネスコスクール最優秀賞」を受賞することができました。



学校内でのつながり connecting with the school friends


課程を越えた
友達とのつながり


生徒会によるあいさつ
運動強化週間実施

地域とのつながり connecting with community



運動会や文化祭のポスターを
学校周辺の商店に配付


校外学習などでの公共
の交通機関の利用

社会や学校外とのつながり connecting with society


全国大会やスポーツ大会
に積極的に参加


「地産地消」の学習や給食で
「世界のごはん」を実施

他校とのつながり connecting with other schools


サステイナブルスクール同士での交流学習
自己紹介カードの交換　交流校の合同作品作り

機関包括型アプローチプロジェクト（ホールスクールアプローチ Whole School Approach）に参加

〈防災学習や避難訓練の様子〉disaster prevention


校内防災マップや防災に関する
掲示物の作成


防災体験学習
の実施


地震や火災が発生した際の避難方法を
全校児童生徒で確認


災害時備蓄食料
の確認・実食

〈地域の避難所開設訓練の様子〉evacuation center


地域の自治会と共同の
避難所開設訓練を実施


防災備蓄倉庫
の点検


炊き出し訓練の実施

〈気候変動についての学習の様子〉climate change


気候変動について調べ、
掲示物を作成・発表


「自分たちにできる地球に優しいこと」
としてグリーンカーテンを作成

成果と課題　(Achievements and Challenges for the better ＥＳＤ ｏｆ ＳＡＫＵＲＡＧＡＯＫＡ)

○生徒会の発案で始まったあいさつ運動では、今年度から生徒が強化週間を企画し、より主体的な活動を行うことができた。
(Being able to act independently.)
○「持続可能な社会の構築」「平和」「人とのつながり」等についての児童生徒の視野が広がり、校外でのＥＳＤ部会の研修に興味をもち、継続して自主的に参加することができた。
(Being able to see things from different point of view.)
○ユネスコスクールとして、多くの学校や企業との交流に取り組んだことで、積極的に自分のことを相手に伝えようという児童生徒の姿勢が育まれてきた。また、教員には自校での取り組みや児童生徒の活動を校外に発信しようという意識が高まった。
(Being interested in others and ourselves.)
●児童生徒が企画し、取り組みたいと考えるＥＳＤの活動をより充実させていきたい。
(To promote ESD that students really want to do.)
●ＥＳＤに取り組んだことでの児童生徒の価値観や行動の変化・変容だけではなく、児童生徒と関わった人々の価値観や行動の変化・変容についても発信していきたい。
(To transmit information of how students and people around them have been changing through ESD.)

<< Suffrage for settling foreigners>>

Shibaura Institute of Technology Kashiwa High School
2-3　Motoki Saitoh

<< Main point >>
Recently, the number of foreigners living in Japan is increasing. They are not allowed, however, to vote and to participate in national and local politics, because Japanese is afraid of influence by recognizing it. I will show you this problem and my own opinion with introducing past argument and judgments.

In Japan, settling foreigners are NOT allowed to vote

About giving the right...

AGREE

・The foreigner contributes to economy and pays the　taxes as well as a Japanese

DISAGREE

・Japanese society and　economy are changed dramatically by not Japanese people, but foreigners

Past trial in Japan about the franchise of foreigners

IN 1993
　Trial in the government franchise
(Is it against the constitution that Japanese don't give government franchise to settling foreigners?)
➡judgment The constitutional guarantees only Japanese people it, because the government franchise is premised on　a nation.

IN 1995
　Trial of the right to vote local elections
(Is it against the constitution that Japanese don't give the right to vote a local elections to settling foreigners?)
➡judgment　The constitution does not guarantee the foreigners the right, whereas it is not against the constitution that a law guarantees them it.

※In other country...

	England	German	Sweden	America	Australia	NZ
national	▲	×	×	×	▲	●
local	▲	▲	●	×	▲	●

(▲…partial)

Discussion about this problem in Japan

In 2000 and 2010, Cabinet discussed this actively, however they didn't come up with a concrete proposal. Moreover, few arguments are held, so the problem remains a deadlock.

● Consideration

I find that many foreigners settle in Japan, and they are troubled by not being able to participate in politics. They cannot express their own will about politics. I think it is profitable for not only the foreigners and but also Japanese people. Of course, I don't say that all settling foreigners should be given the right, because some can vote for not Japan but only themselves or their mothers countries. In my opinion, only those who have sound idea on improvement in Japan, and the future of Japan should participate in Japanese politics. (for example, those who has been living for a specified period of time and hasn't committed a crime should.) The world has been globalized, so "Times" when it matters whether you hold Japanese nationality is changing.

Activity Report

Education for Sustainable Development

Ichihara Chuo High School

Presented by TAE HYUN JANG & RYSE PROMNITZ-HAYASHI

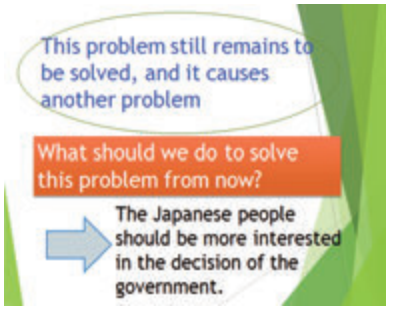
<< The problem of Japan after the World War Ⅱ >>

Shibaura Institute of Technology Kashiwa high school
2−3 Yuki Yasunishi

<< Summary >>

・The difference between Japan and Germany from World War Ⅱ caused by Japanese who don`t take responsibility

・The Japanese people should be more interested in the decision of the government.



Ichikawa high school 2-4 Ikoi Ishido , 2-5 Yuhi Sato

Fair trade in the future

"Shopping is about voting for the sort of society you like"

The important key word is "consumption voting"
If you pay attention to the destination of money you pay for what you buy, just as "voting", they the society will change.
Let us compare fair-trade chocolate and other similar (but non-fair trade) products, to think about what fair trade is.

	Fair Trade chocolate	Ghana chocolate	Frappuccino at Starbucks
Daily sales	Some 5,000 bars	Some 5,000,000 pieces	Some 140,000 cups
Price	¥350 expensive	¥70 cheap	¥600 expensive
The reason for its price	Fair trade	Not Fair trade	Brand name
taste	Good!	Up to you.	Good!

<What the table shows>

Ghana chocolate is cheap and sells well."The cheaper, the more sales?" Not necessarily, since Frappuccino, rather expensive, sells well.That is, quality is sometimes more important than the price.Further, expensive fair-trade chocolate seems more justifiable than expensive Starbucks Frappuccino.
Then why the sales volume of Fair trade products are not so good?
The sales of Ghana chocolate went up rapidly because of its red package. Meanwhile, Starbucks Frappuccino has the transparent cup (with a logo) through which the colorful content can be seen. Youngsters find the design so "cute!" and, every time the company makes up a new line up, they would love to upload its photos on the SNS.
From this, it seems there are two differences between fair-trade chocolate and Ghana chocolate (or Starbucks Frappuccino).

- Package design
- Gaining popularity because of SNS

<people tree>


Chocolates


Card


Candles


Earrings

<Atelier Likha>


Book cover

<Shaplaneer>


Soap

And then, there are already good design Fair trade products. I7m going to introduce some of those products.

I really do not want to recommend all these products (since they will not be "my own"). Atelier Likha, a Japanese NGO in the Philippines and where I served as a volunteer, produces a nice book cover, and it is my real favorite. Thus, there are already so many good-design fair trade products. The next step is to consider how to make those fair trade products better known. Since my mother is selling fair trade products, I often have fair trade chocolates, cocoa, jam and curry powder; and I also use fair trade commuter's purse.
I know there are students who make research into fair trade and made their "advertisements" in their social study class.I do think they are interested in fair trade; then I would like to ask them: "are you spreading the idea of fair trade after knowing actually eating or trying fair trade products to know them better?"
You know, fair trade products are really tasty. They are cute. And they have such a high quality.
Of course the reason why we should spread the concept of fair trade is precisely their fairness-orientation. If that is everything, however, youngsters would eventually avoid going for fair trade products. "Because they are tasty", "and because they are fashionable": I hope to introduce fair trade products for these reasons.
One of the tools for me in this context is using social network service (SNS).

<How to improve the concept of fair trade>

Some companies engage in fair trade activities since they are concerned with their own public image or reputation. In Japan, that sort of "abusing the image of fair trade" might not be so common, but in other countries where fair trade business is common, such kind of abuse is happening, I hear.
Not a few people might be interested in fair trade but they might think "is this information on fair trade really trustworthy?" For the benefit of those people, companies should clearly indicate to consumers how their fair trade enabled some children to go to school, or made changes in the income level

<Our approach>

We introduced fair trade products on the occasion of school cultural festivals. We displayed those fair trade products in a hallway and not in a classroom, so that everyone who passes by can have a look at them.
We sold fair trade chocolates (800 pieces through two days.) When people buy those products, we also explained what fair trade is.
Then even after the festival, those who did not purchase the displayed fair trade items might later think: "oh this a fair trade product, which I saw in the cultural festival!"
We noticed some points through this project. Especially, fair trade products are made for women, so those are less attractive for men than women. (As you can see products above.) So we want our school to keep this project as an annual event in light of our own experience.

<<What is Game Theory?>>

Shibaura Institute of Technology Kashiwa High School
1-5 Taisei Hayakawa Masataka Akiyama Kosuke Kitamura

<< Main point >>

It has important meaning to learn game theory as thinking logically.

<< Introduction >>

Do you know the word "Game Theory"? It is a subject which studies actions of people.
It has been developed recently.
It is used as a basic theory these days.

For example, "Prisoner's dilemma", "Nash equilibrium".

<<Preparation >>

<meaning of words>

Player: players who are in the game give top priority to their benefits without their emotion
Strategy: an action which players can choose
Strategic form game: a game in which all players take actions at the same time.
Dominant strategy: a strategy that maximize a benefit to whatever an opponent choose strategy.
Best response strategy: a strategy that make a benefit most to a strategy an opponent choose.
Nash equilibrium: a combination of strategy all players choose best response strategy

<<Prisoner's dilemma>>

<content>

"Two men who committed a crime are being arrested because of searching separately. Two policeman are saying that "I will make you innocent if only you admit confess and opponent keep silent" and try to do plea bargaining for each one. If one ride to the invitation and another keep silent man who admit confess can be innocent and man who keep silent have to be in prison for ten years. If both of them admit confess ,they have to be in prison for five years. If both of them keep silent they have to be in prison for a year. If you are prisoner, which will you choose?"

Under table insist these situation. It is called "payoff matrix"

1 \ 2	Keep silent	confess
Keep silent	(-1,-1)	(-10,0)
Confess	(0,-10)	(-5,-5)

<explanation>

In this game, solution is that both of them admit confess. If both of them keep silent, they have to be in prison only a year, but one need not be in prison if only one admit confess. As both of them think these, they admit confess although it is better to silent. In other words, they are to admit confess inevitably and it becomes bad result for both.

<<Finally>>

I want to apologize that I can not explain Nash equilibrium in detail.

<< References>>

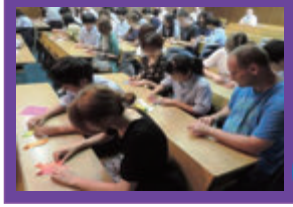
We referred to the book "Seminar The Entrance of Game Theory (written by Takahiro Watanabe)".

E S D

We offer many learning opportunities and
bring up leaders of making sustainable society.

Ichikawa Subaru High School

International Understanding



Community involvement

Financial Education

Disaster Prevention

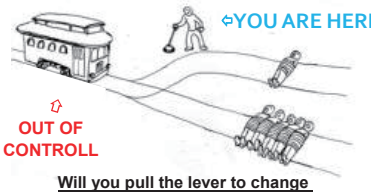
<Thought Experiment>

Shibaura Institute of Technology Kashiwa High School
1-5 Makoto Sakamoto Erika Tanaka

<What is **"Thought Experiment"**?>

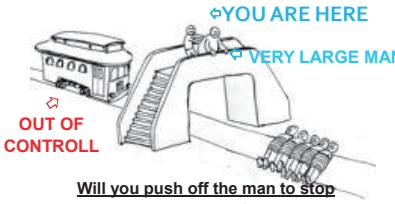
In thought experiment, you consider matters in your brain without any tools.
You can think about various themes like physics and sociology.
We have studied about **The Trolley problem**, which is one of the most famous problems.

FIGURE1



Will you pull the lever to change direction of the trolley?

FIGURE2



Will you push off the man to stop the trolley?

<What is The Trolley Problem ? >

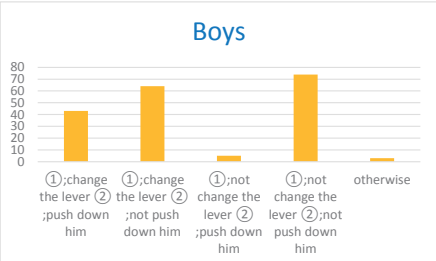
A runaway trolley is heading toward five workers. Accidentally, you are standing behind a liver to change the way of the trolley. Then, you try to pull the lever to save them. However, there is a person working on the other way. Do you change the way of the trolley or not?

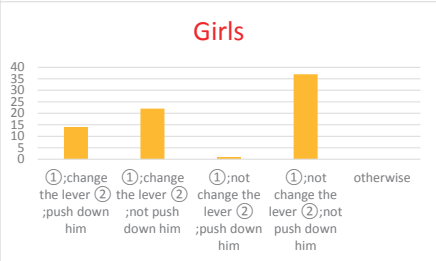
In figure 1, many people think that changing way to save five people is right though it sacrifices one person. It is based on philosophical principle called "Utilitarianism". However, people do not always follow this principle. Let's see another situation.

<Another version of this problem>

Now, you are standing on a bridge. Then, a runaway trolley is heading toward five workers. There is no way to stop the trolley but push off a very large man standing in front of you. Will you do it or not?

In figure2, many people do not say okay to throw the man. Situation to sacrifice a person to save five people is same, but in this case, you are to kill an innocent man on purpose.





<sourses>
Trolley problem TED-ed
https://www.youtube.com/watch?v=TGxgFXGQNww
Trolley problem2 TED-ed
https://www.youtube.com/watch?v=sEXfBlkRRtE
The Trolley Problem BBC Radio 4
https://www.youtube.com/watch?v=bOpf6KcWYyw

This graph shows choices of students in our grade against these cases.

Extreme Weather Events

WHAT IS HAPPENING IN THE WORLD?

Chiba Higashi Senior High School 2-7 Aya Koshizuka

In earth science class, our teacher taught us that extreme weather events are increasing in recent years. I'm interested in extreme weather events and I researched them in detail.

Hurricanes

Hurricane Irma struck the Caribbean, and many of the island's residents were forced to leave. Many strong and large hurricanes occured in nothern atlantic on end.

Flooding

Heavey rains brought severe flooding to India, Sourthern Asia. Millions were affected and more than 1200 were killed.

Torrential rain in northern Kyushu region in July 2017

Droughts

More than 6.2 million people are currently facing food insecurity and lack of clean water. It is because of rivers that are drying up and recent years with little rain in Somalia.

Major Heatwaves

Wildfires occured a lot in Europe and the U.S. due to dreadful heatwaves. Reserachers estimate that 74% of the global population will experience more than 20 days of "deadly heat" by 2100.

As an approach to climate change, **The Paris Agreement** has been in force since the 4th of November 2016. It is the agreement within the UNFCC (United Nations Framework Convention on Climate Change). 195 UNFCCC members have signed the agreement, and 173 have become part of it. It aims to:

(a) Not let the global temperature rise any more than 2 °C of the pre-industrial level, and try to limit global temperature to rise no more than 1.5 °C of the pre-industrial level, recognizing that this would significantly reduce the risks and impacts of climate change;

(b) Increase the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production; and

(c) Make finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

<<Why did Aum Sinrikyo cause Tokyo subway attack? >>

Shibaura Institute of Technology Kashiwa High School
1-5 Kosei Saika Shunnsuke Okada Yuto Shiotsuki

<<purpose>>

We do not know the meaning of Tokyo subway sarin attack, but it is a word heard from young times.
By knowing the meaning of this word, we felt deep sorrow and great anger.
We do not know all the meaning of this word.
There are people who do not know about it besides us.
Although we have different generations, we believe we need to know about this incident.
Therefore, we investigated this case in detail.

<<How to establish>>

Yoga Circle 'Aum Shinsennokai'(in Japanese オウム神仙の会) was established in 1984 by Shoko Asahara (real name: Tizuo Matsumoto).He taught Indian yoga and Buddhist teachings with its own interpretation. Followers worshiped Shiva as their main god. They were the guidance of the teacher leading.

<<About Tokyo subway sarin attack>>

In 1995, Aum Shinrikyo blew sarin's toxin into Tokyo subway, 13 people died, 6000 people suffered severe mild symptoms.
After 8:00 am on Monday, March 20, 1995, Sarin was sprinkled with five trains, including Teito High Speed Transportation (now the Tokyo subway) Hibiya Line, Marunouchi Line, Chiyoda Line. On May 16, 1995, Shoko Asahara, a representative of Aum Shinrikyo, was arrested.

<<Why did Aum Sinrikyo cause Tokyo subway attack?>>

As the answer to the question why did Aum Shinrikyo cause Tokyo subway attack, the theory were retribution to society as a result of losing the House of Representatives election and to delay the forced investigation by the police , in fact they were different . At that time , Aum Shinrikyo were active with the wolrd relief raised . Asahara explained the way of the world relief raising was to avoid nuclear war , but , actually he thought crush to capitalism and socialism to make a religious country . As a way to do that , they stood as a candidate , however , they failed to become a member of House representatives , so they intended to make a new country by using military power . And as an early stage of their militarization , we think that Tokyo subway sarin attack had occurred .

<<Why was the police could not prevent Tokyo subway attack ?>>

We think there are three reasons . First , police could not share the information . Then , they were strongly conscious of territorial waters by the prefectural police and they were not communicating . Second , there were believer in Aum Shinrikyo inside the police , so information leaked out . Even if they tried to conduct a compulsory investigation , there was no evidence of the incident . Third , the police had known about Aum had had sarin . But , there was no reason to arrest because there was no law to crack down on it .

For the above reasons the police could not prevent Tokyo subway sarin attack .

<< References>>

NHKスペシャル未解決事件オウム真理教秘録
[編著]NHKスペシャル取材班 文藝春秋

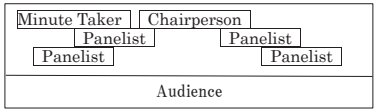
Panel Discussion

Chiba Higashi Senior High School 1-5 Tanizaki Kanako

We performed panel discussions eight times in LHR this year. The purpose of a panel discussion is to develop our own ideas by exchanging opinions with each other who have different considerations. We choose our theme among these five topics. 1 group (7 members) will decide each role (1 Chairperson, 5 Panelist, 1 Minute Taker). After that, all the members make opinion papers for preparation.

This year's themes were: ①Globalization and Anti-globalism, ②Active learning, ③Heart transplant, ④Global warming, ⑤Elections of Japan

A "Panel Discussion" is a system where some panel members discuss with the chairperson, then the audience takes part in the discussion after hearing them.
Our goal is not only to make conclusions but also to learn how to have a discussion.



～The flow of a panel discussion (30 min)～

STEP 1

The chairperson explains the topic's main point to the audience. (3 minutes)

STEP 2

Panelists state their opinions about the topic. (5 minutes)

STEP 3

Panelists ask questions to each other. (10 minutes)

STEP 4

The audience and panelists have a discussion about the topic. (15 minutes)

STEP 5

The chairperson summarizes all the opinions discussed. (5 minutes)

Important Points

Chairperson needs to:
- activate the discussion
- control the direction of the discussion
- manage the time

Minute Taker needs to:
- take notes of the discussion

Panelists need to:
- speak and look towards the audience
- prepare their own opinion
- gather information

Audience needs to:
- take part in the discussion
- have their own opinion

Panel Discussion

Imagination
Learning to think for ourselves to solve problems.

Problem-solving skills
We can improve the ability to solve problems.

Communicative competence
Learning to listen to others opinions and answer appropriately.

Widen perspectives
We can broaden our horizons with different opinions.

<<Why do human beings travel?>>

Shibaura Institue of Technology Kashiwa High School
1-5 Yuta Hagio, Jun Tokuda

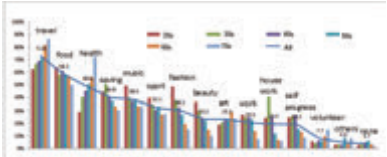
<< Main point >>
Human beings want to forget their daily lives in travels.
And human beings can leave their daily lives because they feel relieved to think they can come back.

<< Introduction >>
We are interested in travel, so we want to know what makes us travel.

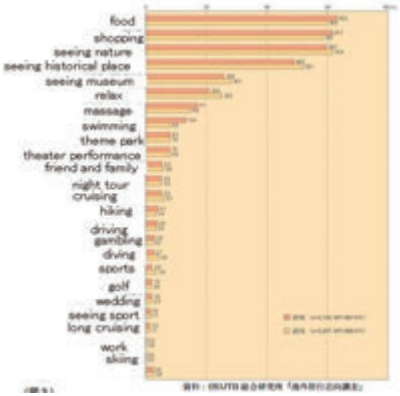
<< Research Content >>
・What's "travel"?

・What we thought before this study.

・graphs
What travelers are interested in usual.



What travelers did during their travel.



<< Result>>
・Travelers tend to like food and see sightseeing spot.

<< Consideration >>
・We thought travelers want to relax in their travel, because they can forget their daily lives in travels. And it is important that they can come back home.This gives them confidence.

<< Reference >>
・「ツーリズムと観光の定義-その語源的考察、および、初期の使用例から得られる教訓」 佐竹 真一

・「JTB REPORT 2017 日本人海外旅行のすべて」

専修大学松戸中学校高等学校のグローバル教育（本校の取組）小泉　毅

◇本校は高校が昭和 34 年 中学校は平成 12 年に開校　◇アメリカ ネブラスカ大学への語学研修は昭和 63 年より実施(左)
◇16 年前の中学校の 1 期生が 3 年生の時から アメリカネブラスカ州への 13 日間の修学旅行を実施しています(右)

英会話専門の校舎 アンビションホール

中高合わせて7人のネイティブ教員
本物の英語に触れる環境が身近にある

2016 年　2017 年
2 年連続で難関突破
全日本高校模擬国連大会に
出場し大きな成果発揮

◇高校の姉妹校であるアメリカ ネブラスカ州のリンカーン・サウスウェスト高校の生徒さんとの 茶道体験交流(左)　◇東京オリンピック パラリンピックに向けて 地元松戸市がルーマニア選手団のホストタウンとなり ルーマニアのオリンピック関係者来日時に本校へご招待し 書道体験など様々な日本文化の体験交流をしました。(右)　☆海外からのお客様来校時にはいつもグローバル・スチューデント・リーダーズが活躍します

☆グローバル・スチューデント・リーダーズ　（国際委員会）
様々な行事や地元での語学ボランティアなどでも活躍

2週間のアメリカ修学旅行のすぐ後に行われる ISA プログラム

2月に行われるマレーシアへのグローバル研修

<How much is the degree of attention to American economy?>

Shibaura Institute of Technology Kashiwa High School
1－5　Ken Shimizu　Akihiro Kaku　Joichiro Shimada

<Introduction>
FX traders are using many tools. And they can guess and imply the future of America.
Therefore we follow the change of economic indicator's value to know the flowing economy.

<Method>
A= Result value (green circle in Figure 1) － The previous result value (gray circle in Figure 1)
B= Result value (green circle in Figure 2) － Expected value (gray circle in Figure 2)
C= Value of dollar after announcement – Value of dollar before announcement (blue lines)
①:A/C　②:B/C

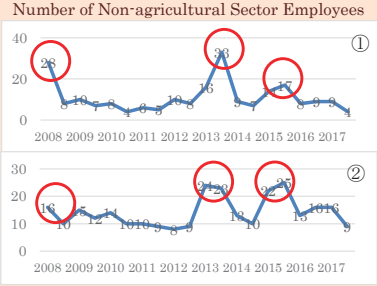
<Economic Indicator>
Number of Non-agricultural Sector Employees
Consumer Price Index
Quarterly Real Gross Domestic Product
Number of New Home Sales

Figure 1

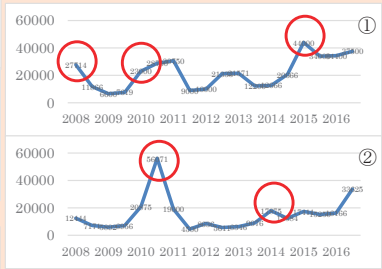
Figure 2

<Result>

Number of Non-agricultural Sector Employees

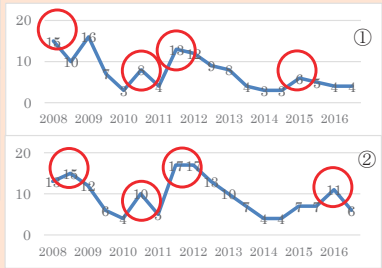


Consumer Price Index



Quarterly Real Gross Domestic Product

Number of New Home Sales



<Summary>
These graphs are not similar very much, but it seems that there are many common points and tendencies between the each two graphs of the same economic indicator's points regardless of the methods.
2008's points and 2010's points are large.
2013's points and 2015's points are top of the small mountains.

<References>
http://shihyofx.com

千葉県立 Funabashi Toyotomi High School
船橋豊富高等学校

At Funabashi Toyotomi High School, members of the student government and the JRC-UNESCO Club are mainly working every day for our core objectives of local interaction and environmental issues as UNESCO member school. For the local interaction, the members participate volunteer activities for about 30 times throughout the year by using their summer vacation.

Activities in 2017

Type of Activities	Times / year
Visit to Funabashi Special Support School (Assisting its school festival)	1
Visit to Care House Shion (Exchange program)	9
Visit to Afterschool Day Service Color's (Assisting its summer festivals, sports festivals and other events)	1
Visit to Pfrege Funabashi (Assisting its summer festival)	1
Visit to Tsuboi Ai no Sato (Assisting its summer festival)	1
Visit to Sakura House (Assisting its summer festival)	1
Participated to Team Omotenashi 2020※ 1	4
Visit to Toyotomi Elementary School (Tutoring)※ 2	4
Toyotomi Social Work Festival	1

Tutoring
(at Toyotomi Elementary School)

Assisting Color's Sports Day

Team Omotenashi 2020

Helping at a special support school's school festival

※ 1 Posted on the Chiba Nippo Newspaper and the Mainichi Newspaper on July 31, 2017

※ 2 Posted on the Chiba Nippo Newspaper on August 7, 2017

For the environmental issues, members of the student government and the JRC-UNESCO Club collect empty cases of contact lenses and PET bottle caps as "Toyotomi Eco Campaign" with the cooperation of Eyecity (Japanese contact lenses manufacturer and seller).※3

We donated the profit raised by the recycling to Japan Eye Bank Association.
The efforts that we made in the long-term volunteering work was acknowledged by the Director-General of Chiba Youth Issue Department, and the Light Blue Youth Award was also issued.

※ 3 Posted on the Eyecity's homepage

<< The history of alphabet >>

Shibaura Institue of Technology Kashiwa High School
1-5 Hinata Araki Momo Inoue

<< Main point >>

We interested in language that we always use, so we examined the alphabet. Especially, we searched English alphabet.

<<Introduction>>

We wondered how the alphabet that we use in the English class was established, so we particularly searched English alphabet.

<< Content >>

1. What's the alphabet?

The alphabet is classified as a phonogram which expresses a phoneme itself and it is arranged in a traditional arrangement.
Usually, Latin alphabet is called "alphabet" in particular, but alphabet shows character list, so there are various kinds.

Kinds of alphabet
- English alphabet
- Spanish alphabet
- German alphabet
- Polish alphabet

We usually use English alphabet, so we researched history of it.

2. History of the English alphabet

The English alphabet changed as follows.


Hieroglyph
↓

Sinaitic character
↓

Phoenician character
↓

Greek character
↓

Latin character

Accurate information on the history of hieroglyphs and Sinai characters has not been elucidated and linguists have published a number of hypotheses.
B.C. 1000 Beginning, Phoenicians living in North Africa advanced into the Mediterranean world, so by this way, the Phoenician characters they used were transmitted to the Greeks. Then Greeks made Greek characters borrowing Phoenician characters.
In the 7th century B.C., the Latin who lived on the Italian peninsula took characters from Etruscans and Greeks and made Latin characters.
The old English that is the source of the English alphabet started with Anglo-Saxons bringing Rune characters into England around the 5th century, mixed with the Latin letters brought in by the Christian missionaries around the 7th century.
And they changed to the current Latin characters.


Rune character

3. Summary

About the history of characters we understood that maritime trade is greatly involved.
In this way characters have been made.

<<Bibliography >>

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https://ja.wikipedia.org/wiki/%E8%A1%A8%E9%9F%B3%E6%96%87%E5%AD%97
https://ja.wikipedia.org/wiki/%E3%82%A2%E3%83%AB%E3%83%95%E3%82%A1%E3%83%99%E3%83%83%E3%83%88
http://kidsweb.learn-together.net/2009/img/hierok.png

NAGAREYAMA HIGHSCHOOL

~Our dreams will come true!~

RYUKO BRAND is becoming widely known.

This is our school's culture festival poster

☆Some mass media tell our activities.

☆We learn many things with inquiring mind.

☆Not only locally but also globally, we are planning to act.

Let's check our activities!

① Collaboration with our city

② We produce farm products and sell them by ourselves.

③ We get many licenses.

④ We learn many things from the special sessions.

⑤ Contribution to community service

⑥ Interaction with many people

BUDO ~Martial Arts

Kageyama Yui　Kouno Hiromori　Kobayashi Hiyori　Yoshikawa Kei

☆Introduction

What do you have in your mind when you hear the word 'Budo'?

We start it with bows and end bows.

SUMOU

Which is the closest to the average weight for SUMOU Players?

80kg　120kg

150kg　300kg

•JUDO

1.Grasping each other

2.Perform technique

3.Referee's judge

4.Decide the winner

throwing technique

•JUDO'S SPILIT

"Persuasion is often more effective thanforce"

～柔能く剛を制す～

What is the differences between Kyudo and Western archery?

How is the winner decided in Western archery and Kyudo?

Western archery

Score is 22.

Kyudo

Score is 3.

KARATE

「Kata」 & 「Kumite」

What is karate's band color？

KENDO

Bomboo sword (Shinai)

☆Conclusion

Through playing martial arts, we esteem respecting the opponent and we can train not only skills but also spirit.

We hope we can play Budo with you someday!!!

ESD in Sakura Minami High school

2018/02/18
Sugita Yuki, Magara Mathilde
Mauchi Yo, Yamanaka Anna
Nozaki Manami, Kokubo Yuri, Sato Koki

Let's start with what we can do!

With Inba dependent school


Inba dependent school students sell the breads they made, exchange at school events, and our teachers are interacting with classes.

With Wake Sizutani School students


We exchange it high school of UNESCO school outside the prefecture.
We talked about what each school have done as an UNESCO school.

Exchange

With foreign students


We interacted with foreign school students from Melos Gakuin, Japanese language school through classes.

Disaster prevention concert


We invited Argentian guitarist and held a concert at our school and enjoyed sessions with the brass band club there.

Volunteer

✚ And more





We joined community events and help management. We are doing plastic bottle caps collection campaign. We are doing it to exchange for vaccine. That will help a charitable organization give the vaccine to children. We clean school routes as a volunteer. We pick up garbage on the school routes.

千葉県立
木更津高等学校

Chiba Prefectural Kisarazu High School

YUKATA

TANIGUCHI Hayato, YAMAMOTO Ayaka,
ICHIKI Yusuke, KUNIYOSHI Shihono

[Abstract]

How much do you know about Yukata? Maybe many of you don't know well about its history, how to wear Yukata, when to wear Yukata and so on. Actually, we were one of them. Today we'd like to report what we studied about Yukata.

2016—2017　About our research　　Chiba Prefectural School for the visually impaired

Research subject :
Curriculum according to the educational needs for each student

Research theme :
We examine the contents of learning students with visual impairments experience foreign cultures and deepen exchanges with utilizing ICT and so on.　We research the ways to send actively and to be necessary for their improving language and communication skills.　Also, we will verify the way of education that can respond to globalization.

The reason :
When students with information disability participate in society and get more information and send out it from themselves, ICT is an effective means.
And, to send their own thoughts actively for others with different cultures is based on "self-understanding" "regional understanding" as well as "challenging spirit" and "toughness to overcome difficulty". In order to acquire the ability to respond to a keen society by globalization rapidly, it is necessary to utilize highly convenient ICT, accumulate highly versatile practical examples such as educational content and support method.

Expected result :
(1) While deepening understanding of different cultures, we can respect others.and enhance communication skills to collaborate.
(2) By utilizing ICT tools which are presently highly versatile, and verifying the effect, consolidation of their examples can be a guide for our domestic weak-eyed education etc.


Exchange meeting with foreign students from Taiwan


English lessons with Skype with ALT

We are planning to continue exchanging with e-mail and skype in the future.
Those who can cooperate, please call out.
Thank you.

Relationship between human character traits and academics ability

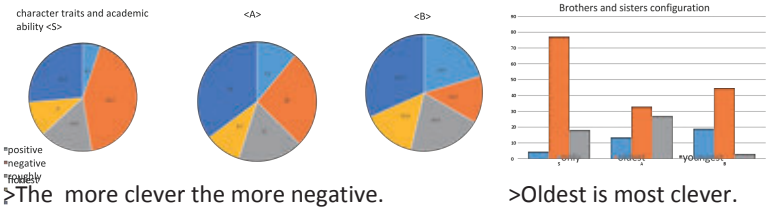
(1)Motive
We are interested in what kind of students are clever..

(2)Investigation
We distribute questionnaire for 5classes which chose random and get the answers these questions.
- GTZ
- Brothers and sisters configuration
- What are you often do at the home
- character traits
- Sports experience yes/no

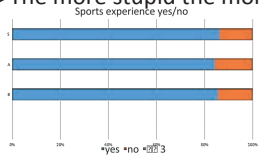
Survey persons : 125 persons

(3) Forecast
The positive are clever.
The first child is clever because they have a sincere.
The person who have a sports experience is a clever because they are patient.

(4)Result



>The more clever the more negative.　　>Oldest is most clever.
>The more stupid the more positive.



>Sports are not relevant to academic ability.

(5)Difference between forecast and result
We have thought that the positive are cleverer than the negative. However, many clever people have negative aspects.
Playing sports makes people patient so we thought they can make use of it for studying. However, whether people play sport or not, it dose not matter to their academic ability.

(6)Regret points
The number of people surveyed is small.
The kind of personality choice is small.

(7)Summery
The reasons why the clever tend to be negative is because they think they are still inferior and study more than other people.

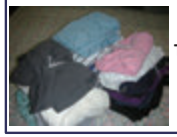
Nagareyama Otakanomori High School ESD Initiative

Fair Trade Educational Initiative

Teaching Process
1. Introduce the term of Fair Trade
2. Explain Fair Trade and industry standard practices
3. Show fair trade and industry produce
4. Students research on their own
5. Final Paper

Used Clothes Recycling Project

Clothes Collected at School Events and at Neighboring Junior High and Elementary Schools



Thirteen Boxes of Children's Clothes Collected → Distributed to Refugee Camps in Africa and the Middle East

English Aid Volunteer Work

Nagareyama Otakanomori students help out Noda Hokubu elementary students via pair work, pronunciation practice, etc.

Five or six volunteers visit the school on Saturdays for two to three lessons.

Elder Care Educational Lecture

Attendees act out skits in weighted clothes, etc to simulate elderly people's daily struggles.

Attendees are a mix of students, their parents and volunteers.

The Laugh-Makers

(BOKE)
①Kotoba Asobi
②Kabuse
③Uragiri Boke

(TSUKKOMI)
①Dotsuki Tsukkomi
②Tatoe Tsukkomi
③Nori Tsukkomi

(Fee)
◎Entrance
10,8000yen
◎Lesson
324,000yen
◎Insurance
5000yen

(Number of people)
500people⇒About**100**people

Japanese
S O V
(subject) (object) (verb)

English
S O V

①Collecting spoiled postcards
②Intercultural exchange for the young generation(with Narita UNESCO Association)
③ESD Forum(at Chiba Univ)
④Interacting with the vocational school in Taiwan
⑤Visiting the Tokyo Motor Show
⑥Vietnam Eco-car Team visits us
⑦Participating in the eco-car competition (in Vietnam)
⑧Principals of Brazilian UNESCO Schools visits us
⑨Contribution to the Local Area -Taking care of the flower bed in front of the station-
⑩The Peace Study -The school trip to Okinawa-
⑪Tradition and Culture
-collaboration with 'Boso-no-mura' (Cultivating traditional Edo vegetables)-
-collaboration with the traditional local brewery (Baking bread with 'sakekasu')-
⑫Natural Resources and Energy
-Cooperation with companies (the study of PHV)-
-We Wins the Eco-car competition for three years -
⑬Environment
-Cultivation of pears by using natto-bacteria to reduce agri-chemicals-
-We gets the certification of 'Chiba Eco-farm Products'-
-Study of the safety method for cultivation-
⑭ As a member of UNESCO school
We learn about environment, natural resources, energy, peace, human rights, tradition, and culture.
And we also actively take part in the intercultural exchange events and contribute to the local area.
⑮Revive the practical Education based on rich humanity
Shimofusa High School
・Agricultural Technologies Course
・Automotive Engineering Course
・Business Information Course

Things Japanese didn't know Foreigners didn't know about Japan

We wanted to know what foreigners DIDN'T know about Japan.

We INTERVIEWED seventeen foreigners at Narita airport.

Q. What DID you think about Japan?
A. Japan is an ancient historical country.

Q. What do you think about japan NOW?
A. Japan is clean.
Japanese are kind, nice and friendly.
Japanese look after each other.
Japan has some beautiful places.
Japan is very safe compared to other countries.

Q. What kind of information do you WISH YOU HAD KNOWN before coming to japan?
A. Of course, the language.
Also, Japan is cold in winter.

CONCLUSION

We found that answer and way of thinking are very different depend on country of origin.
Also, most foreigners seemed like confused that there was a less of English sign. So, we think that it is better to go to increase other languages display at sightseeing spot. By doing so many travelers can enjoy their trip.

Next time, we should ask people who is from many other countries not to be unbalanced.
Before then we want to improve speaking ability.

OTHER EXAMPLES of what surprised foreigners.

・THE TRANSPORTATION SYSTEM is very developed. Foreigners are surprised that trains always arrive on time.
This is why we can make plans in greater detail.
But, Japanese train transfer is very difficult. So tourist need to ask or research deeply.

・OMIYAGE are more than souvenirs.
The term "omiyage" is often translated as "souvenir" in English , but omiyage are much more than that. Unlike souvenirs, which people often buy for themselves, omiyage are something people bring back for their friends, families and co-workers after a trip.

・You can find LOST PROPERTY any place and it back with everything in it in Japan.
In contrast, lost property would be stolen in other country.

GOOD POINT

Though this interview, we had good opportunities to talk to foreigners who speak English. At first we were very nervous. But once we tried to talk,we became loosed up.
That was awesome experience!





ESD that serves community needs

2018

CHIBA REIMEI HIGH SCHOOL

Volunteer work (communication with the community)

Joining volunteer activities is recommended in our school and we introduce such opportunities to students.
A cumulative total number of students who joined them willingly is about half of the total number of students in our school.

Learning support volunteer at primary school

Welcoming regional primary school students as their field trip

What can we do?

Open-school lecture at PC room for citizen

Event staff for child Footballers under the age of 6 (from the soccer club)

Other volunteer activities

・Kids summer camp leader ・Helping regional events as volunteers ・Special Olympics Program
・Volunteer staff for elections ・Managing flowers with JEF UNITED CHIBA and Chiba city
・Volunteer staff for games for the disabled ・Street fund-raising for Red Feather Campaign and Year End Campaign
・Volunteer staff for regional joint anti-disaster drill ・Volunteer staff for the regional public library
・Interaction with Sodegaura special support education school ・World Terakoya Movement etc..

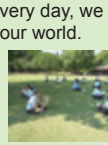
Outcome

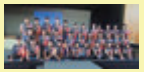
Practicing ESD gives us a sense of exaltation in a totally different way from how we feel from conventional classes. ESD provides invaluable opportunities for students to feel and think about our community and society,which are only available outside the classroom. Through the program,many students get start to think "what can we do for our society?" and "how can we contribute to our society?" as they develop a greater sense of responsibility as a member of the society, as well as awareness of current problems in the society.

Reitaku High School
The International Leadership Course

Learn about the World

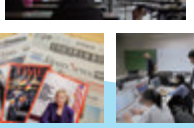
Through our ELA classes every day, we learn, think, and talk about our world.









Cross-Cultural Communication

With a 6-week-long study trip to Australia, we learn to live in another culture, experience unusual things, and understand that we are all the same human beings.

Global Leaders from Japan!
















It is very difficult to communicate well with people from different backgrounds. We learn how we can do that by doing many presentations, speeches, and debates.

We learn about Japanese culture because we believe that it is important to know our own before we learn about others.

Learn about Japanese Culture

Present Ourselves to the World

主催　国立大学法人千葉大学

共催　千葉大学高大連携専門部会

　　千葉大学国際教養センター

後援　千葉県教育委員会

　　千葉市教育委員会

協力　千葉大学教育学部ツインクル

　　千葉大学ESD事業

■事業内容全般に関するお問い合わせ先

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