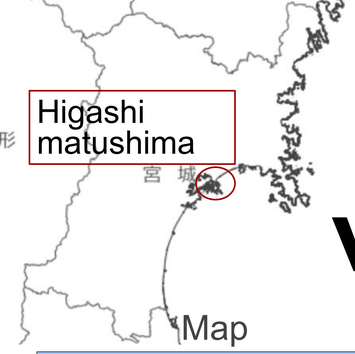
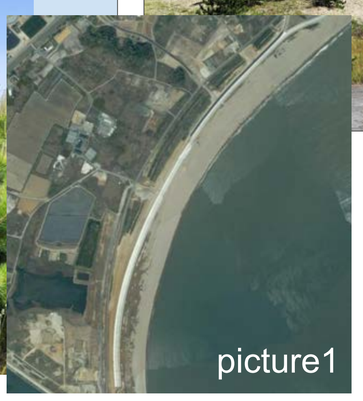


How to protect and effectively utilize vegetation that protects people from tsunami

Sendai Nika High School

Background

Higashimatsushima City is located on the coast of Miyagi Prefecture, and the coast is famous for its beautiful scenery. However, this city was hit by a huge tsunami in the Great East Japan Earthquake. The city suffered tremendous damage.



Theme1:Sandy coast and plants

Problem

How to protect the sandy coast?

・What is role of coastal plants?

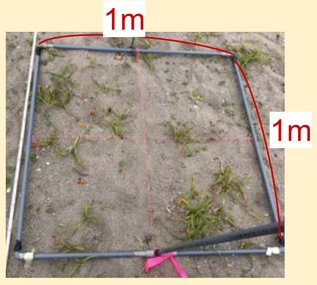
・Groups of coastal plants →on the small sand hills
→Coastal plants =?= Topography of the coast

Purpose

As the first step to maintain the environment of this coast, the research of relation between plants and sandy coast.

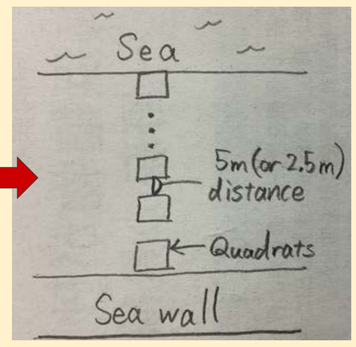
Research method

Check the population of some coastal plants (Transection)



→
Quadrat

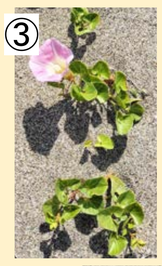
1 Take a line

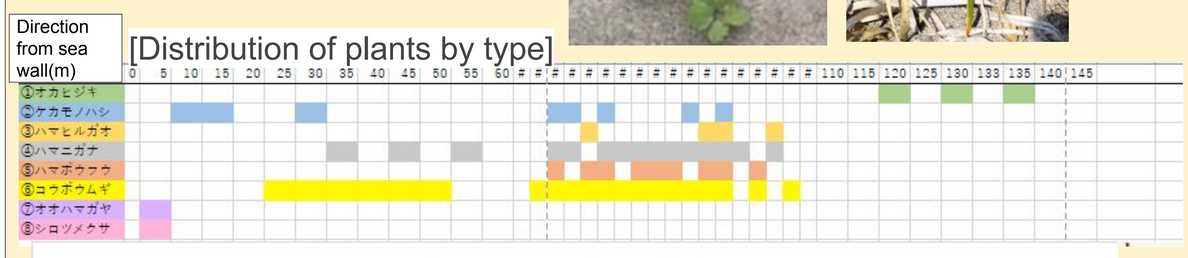


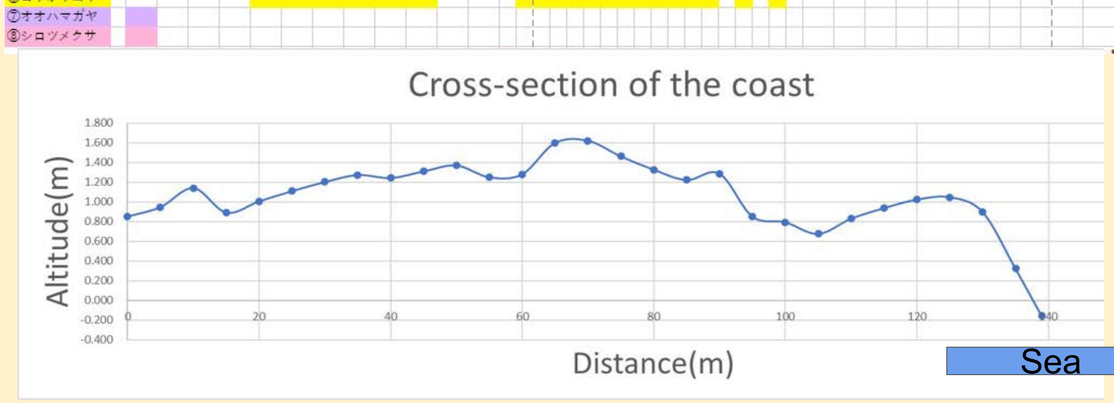
2 place the quadrats

Results

①Saltwort
②many-spike flatsedge
③Sea Bindweed
④creeping beach ixeris
⑤beach silvertop
⑥Japanese sedge
⑦Ammophila breviligulata
⑧White clover







・Higher place→vegetation ↔ Lower place→no vegetation

・Long roots

Conclusion

Thanks to coastal plants with long roots, the coast can be strong.
We have to protect this vegetation for safe lives.

Theme2

Problem

After the earthquake, people living in the coastal area of Higashimatsushima City moved out. As a result, the number of people managing pine trees in coastal disaster prevention forests decreased significantly

Purpose

Finding new ways to put pine needles to good use.

Research method

Materials
•Sugar(white sugar,triturated,sugar,glacial sugar)
• Pine needles
•Tap water

Necessary experimental equipment
•Pan Sugar meter
•Ph meter
•Transparent plastic container
•Weighing scale
Experimental process

①Heat and sterilize pine needles in a thick-bottomed pot, and remove the part near the stem (this part is bitter because it contains a lot of pine needles and terpenes).
②Prepare three clear plastic containers and fill them with washed pine needles (150 g) and water (500 ml water) in which three kinds of sugar (white sugar, three warm sugars, and 50 g of glacial sugar) have been dissolved,
③Left in a place directly exposed to sunlight in a chemical room for 6 days.
④After one week, ph, sugar content, and conductivity were measured.

Results

	White suger	Yellow Suger	Rock suger	Tap suger
Suger contain（%）	5.4	6.0	3.7	—
pH	4.25	4.07	4.23	7.43
Conductivity（μS/cm）	173	272	140	98

There was a slight carbonation sound upon opening the package. Also smelled slightly piney after opening, followed by a strong acidic odor.

Conclusion

Judging from the experimental results of sensory tests and machine measurements, it cannot be said that we were able to create a safe pine needle cider this time.Possible factors that contributed to this result include the long fermentation period and high temperatures

Overall summary

- **The Future of Higashimatsushima Depends on How We Deal with Plants**

Thank you Mr.Goto and Nobiru school

Reference

Map) https://maps.gsi.go.jp/ (date of access:12/8)

Picture1)
https://maps.gsi.go.jp/#5/36.104611/140.084556/&base=std&ls=std&disp=1&vs=c1g1j0h0k0l0u0t0z0r0s0m0f1 (date of access:12/12)

https://mikawanoyasou.org/50on/wamei-data.htm (date of access:10/23)

https://gakusyu.shizuoka-c.ed.jp/science/sonota/ronnbunshu/h25/133068.pdf