

Comparison of the diversity and distribution of plant between compacted soil slope and rock surface slope

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Background Information

- Aim: To compare how the slopes with different slope natures affect the growth and distribution of plant
- Independent variable: slopes with different slope natures (compacted soil / surface of rock)
- Dependent variable: no. of plant species and the percentage cover
- Controlled variables: Light intensity, wind speed, air temperature, air humidity, degree of slope

Apparatus

- 1 Lux meter
- 1 Anemometer
- 1 Thermohygrometer
- 1 Abney level
- 1 Quadrat (0.5m x 0.5m)



Procedure

- A slope with compacted soil surface was found randomly.
- A quadrat was placed on the slope randomly.
- The light intensity, wind speed, degree of slope, air temperature and humidity were measured.
- All plant species enclosed in the quadrat were recognized and counted.

Procedure

- The percentage cover was estimated.
- Another quadrat was placed randomly in the same slope for repeat sampling.
- The above steps were repeated with a slope of surface of rock with similar light intensity, wind speed, degree of slope, air temperature and humidity.

Data collected (table)

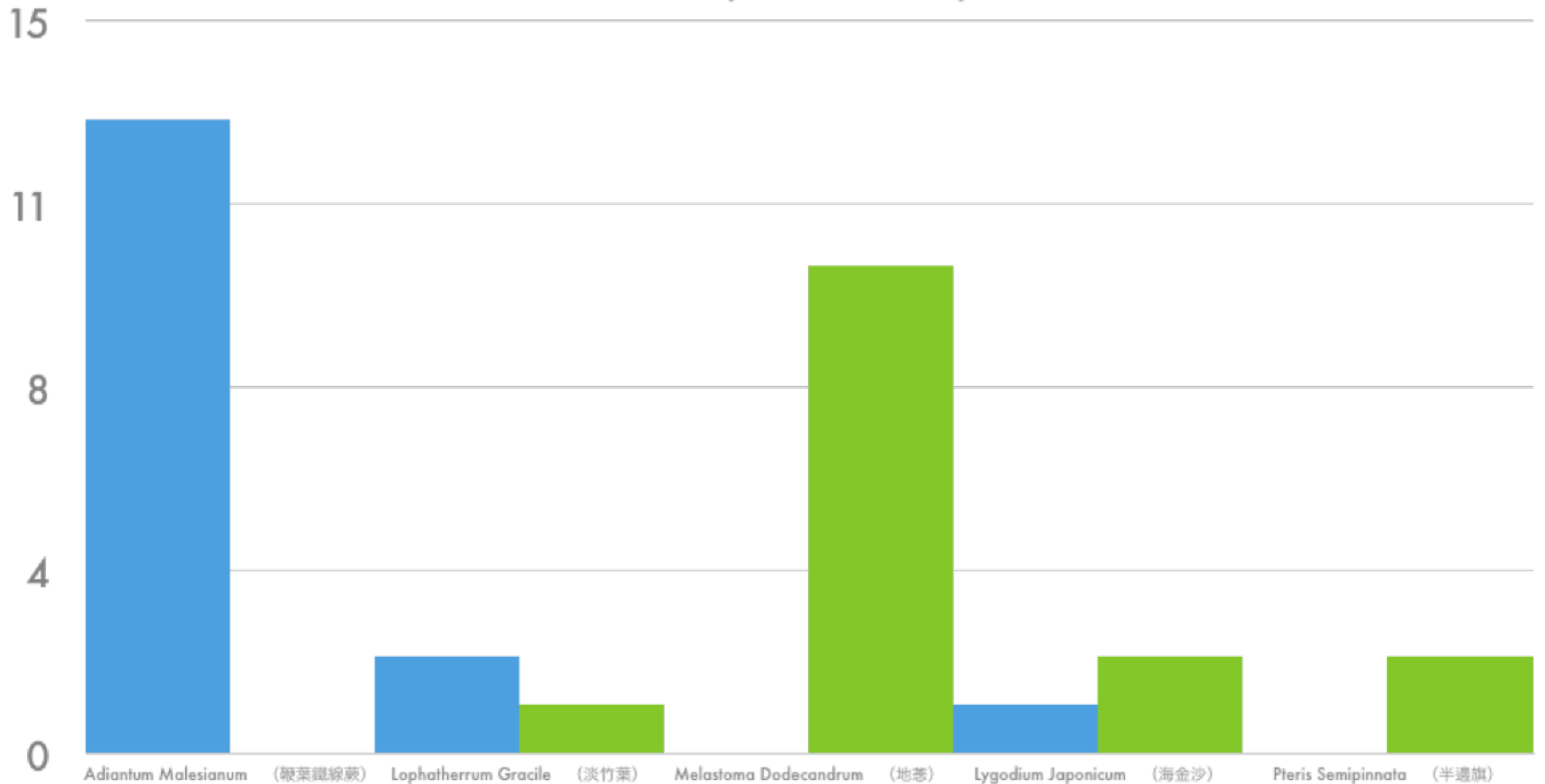
controlled factors	compacted soil surface		rock surface	
	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4
light intensity (lux)	135x100	143x100	144x100	132x100
wind speed (ms-1)	0.4	0.5	0.3	0.3
air temperature (degree celsius)	30.9	31.4	31.5	31.6
air humidity (%)	74	75	74	74
Slope degree	70	62	65	64

The number of plants

■ quadrat 1

■ quadrat 2

the number of plants in compacted soil

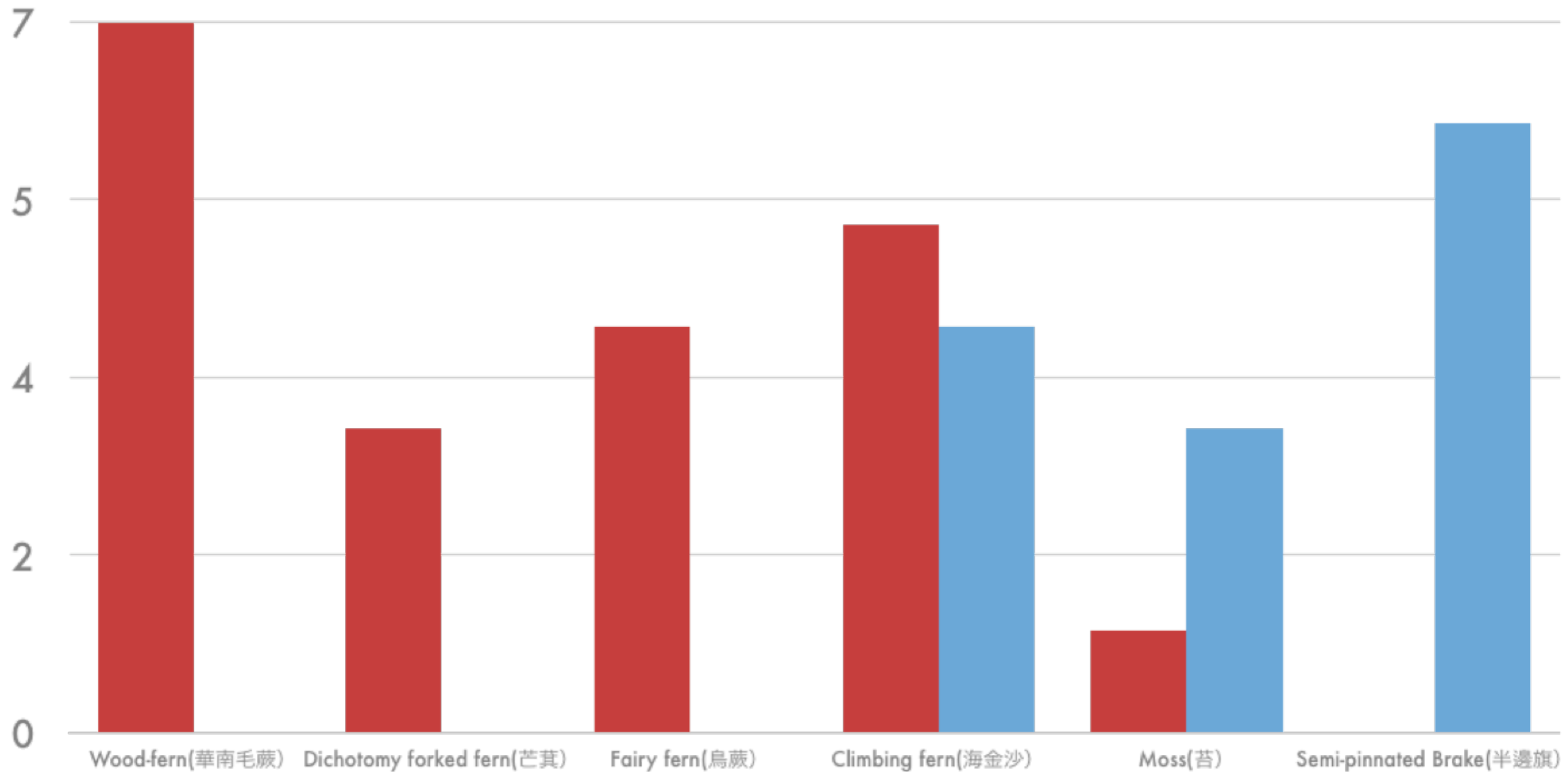


The number of plants

■ quadrat 3

■ quadrat 4

the number of plants in rock surface



Pictures



Total distribution of the plants in two different areas

Two different slope	Quadrat	Percentage cover(%)	Average percentage cover(%)
Compacted soil	quadrat 1	95%	87.5%
	quadrat 2	80%	
Rock surface	quadrat 3	30%	22.5%
	quadrat 4	15%	



Discussion

- The average percentage cover of plant species on the compacted soil surface is 87.5% while that of the surface of a rock is 22.5%
- >>The distribution of plant species is more concentrated on the slope with compacted soil surface.

Discussion

- Reason to choose these 2 different natures of slopes:

---For comparison
>>soil-----natural
>>rock-----artificial



Discussion



- On controlled variables:

>>to keep the abiotic factors similar

>>the difference between species diversity and distribution is due to slope natures

Discussion

- Why there is a greater plant distribution on slope with compacted soil surface than on rock surface?
 - >>soil has larger surface area for plants to grow
 - >>epiphyte can occupy a larger area to grow

Discussion

- more species diversity on the slope with rock surface is due to:
 - >>condition (e.g.nutrients) in soil is more favorable for the ferns / epiphytes to grow
 - >occupy a larger area
 - >be the dominant plant in that soil
 - >inhibit other plant growth

Limitations

- little difference in the controlled variables(e.g.slope,light intensity)
- not accurate enough in percentage cover
- some plant species are difficult to count the number(e.g.moss)

Suggestions

- use the measurement to find suitable areas that have similar conditions
- use more accurate measurement of percentage cover of the plants

Conclusion

- compacted soil has larger percentage cover of plants than that of rock surface
- rock surface has more species of plant than that of compacted soil

References

- Hong Kong Field Guides- Hillsides .Kevin J.Caley.2003
- Common Shrubland Plants.2005
- Common Slope Animals&Plants in Tai Po Kau
- Field Study Handbook.2006





**The end! Thanks for your
kind attention:)**

