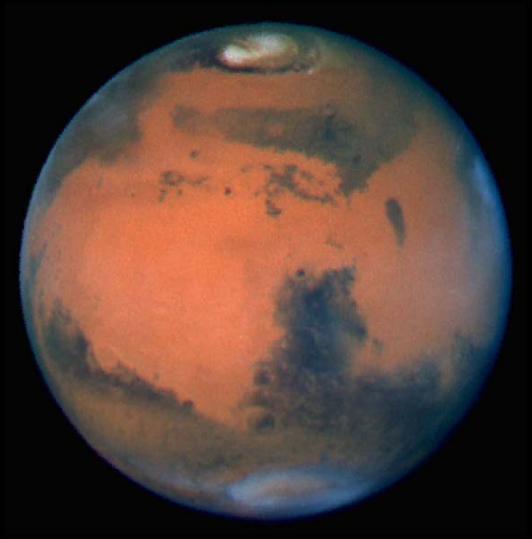
Could Mars Support Plant Life?



Mars

- Mars is the closest of our neighbouring planets. After man went to the moon, the next step was obvious-Mars.
- Mars has been the subject of many unmanned experiments, from the first fly-by by the scientists of the USA's Mariner 4 to the multi-billion dollar curiosity rover.
- The US president George Bush wanted to send Americans to Mars until someone calculated that it would cost $1,000,000,000,000 and the astronauts would probably die from radiation exposure.
- For a viable base on mars, the inhabitants need to be able to grow their own food. This problem inspired us to carry out our experiment.

Aim

- The aim of the experiment was to determine whether Cress seeds could grow in Martian conditions
- The experiment would be repeated at Earth and Martian temperatures (20°C and 5°C)
- We also aimed to investigate the cress growth in the presence of salts known to be in Martian soil (sodium chloride, magnesium chloride, and magnesium sulphate)

Method

- 1) We labelled a petri dish 0% sodium chloride and repeated it for 5%,10% and 20%. Afterwards placed a cotton wool pad in each petri dish.
- 2) We then repeated the 1st step again for magnesium sulphate and magnesium chloride solution.
- 3) After, we soaked the cotton wool with each appropriate solution.
- 4) Next, we placed 20 cress seeds into each cotton wool
- 5) Then leaving it to germinate at 20°C
- 6) We repeated steps 1-6, then leaving the second set to germinate at 5°C

The Results

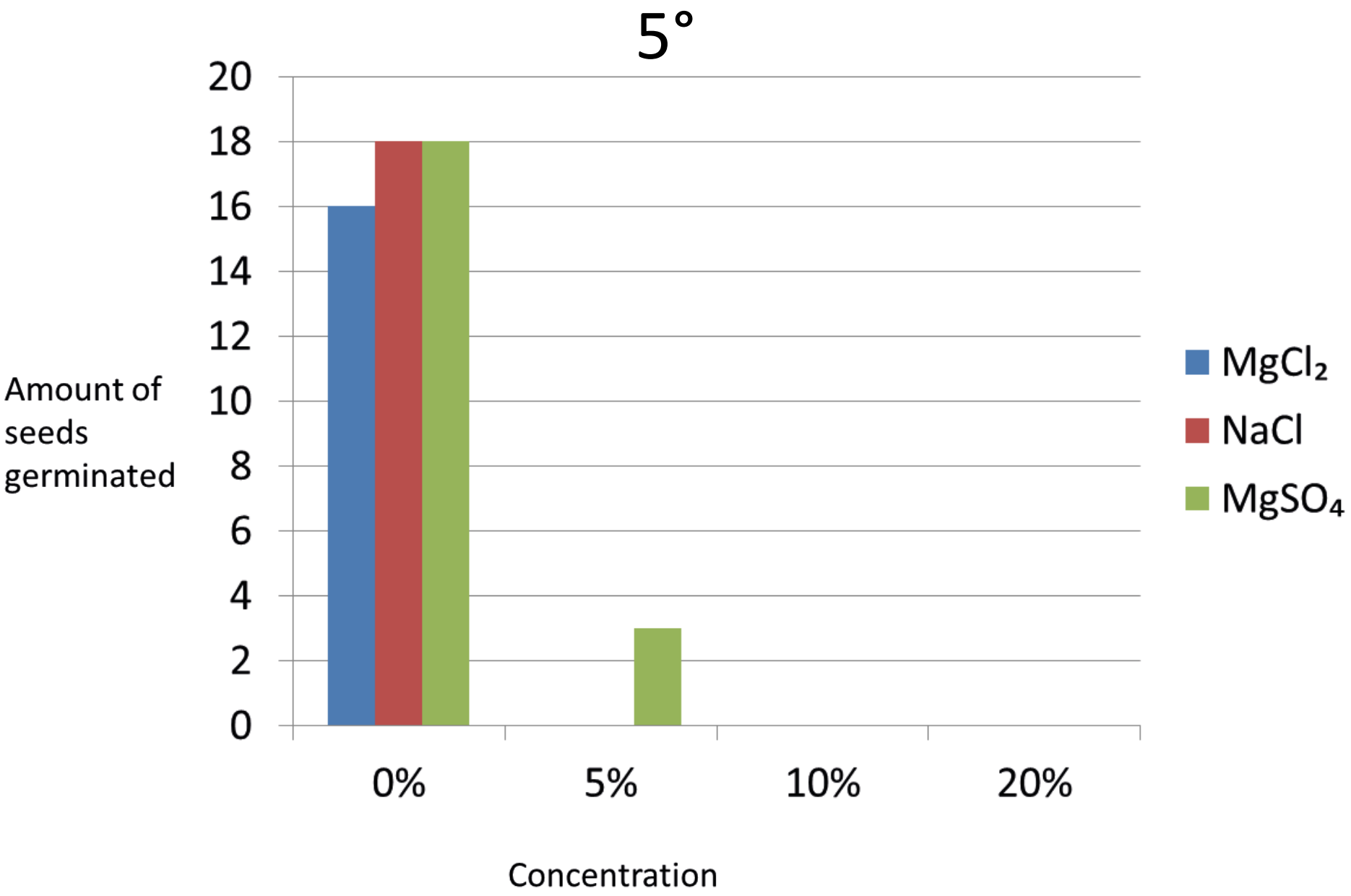
Day 7

	$MgCl_2$	NaCl	$MgSO_4$
20%	0	0	0
10%	0	0	2
5%	0	0	16
0%	18	17	18

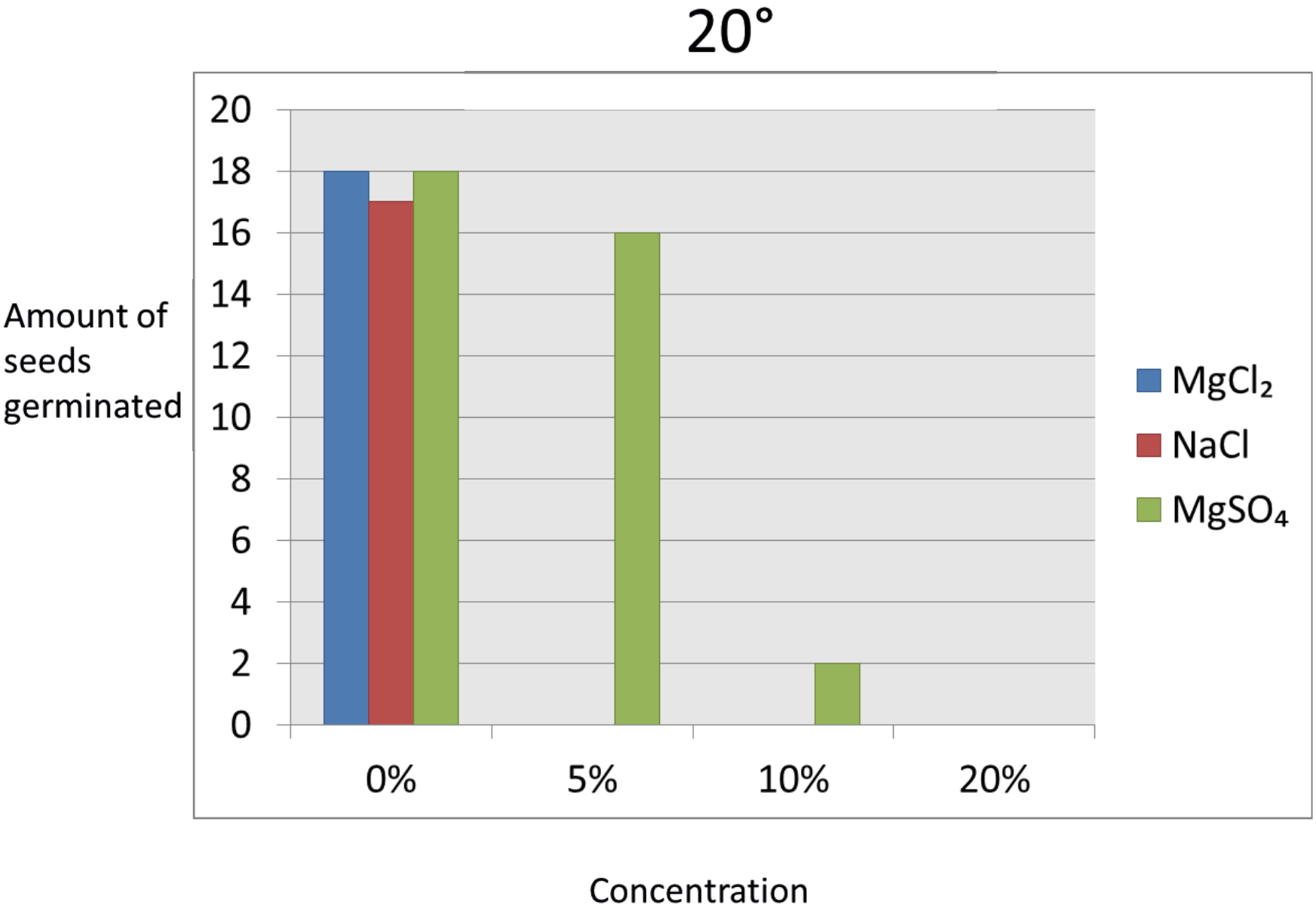
Day 7 5^oC

	$MgCl_2$	NaCl	$MgSO_4$
20%	0	0	0
10%	0	0	0
5%	0	0	3
0%	16	18	18

The Results

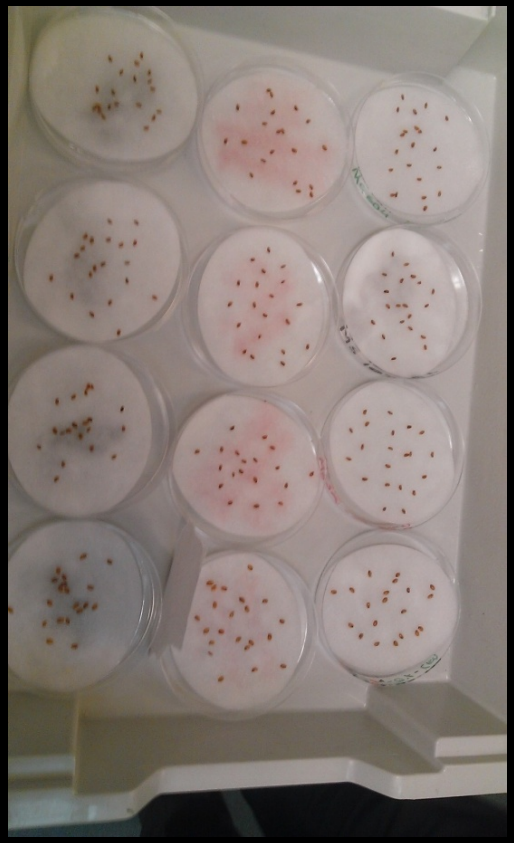

5°
Amount of seeds germinated
20
18
16
14
12
10
8
6
4
2
0
0%
5%
10%
20%
Concentration
MgCl₂
NaCl
MgSO₄

The Results

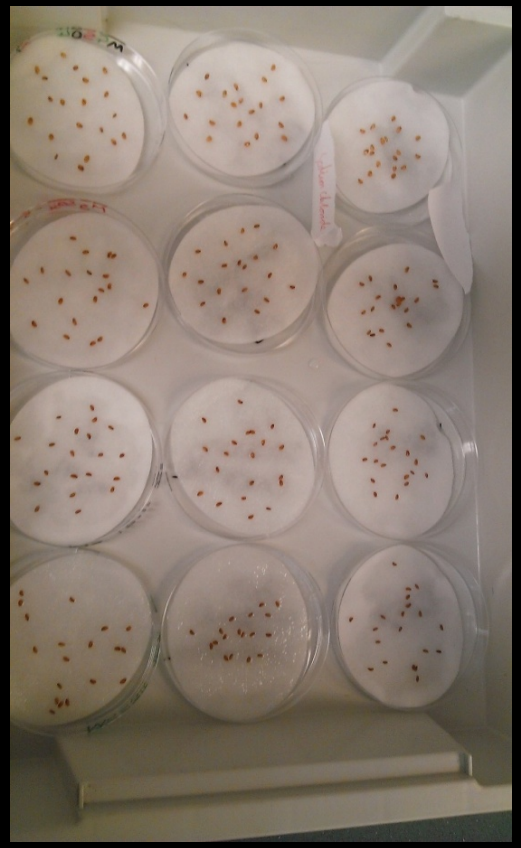

20°
Amount of seeds germinated
20
18
16
14
12
10
8
6
4
2
0
0%
5%
10%
20%
Concentration
MgCl₂
NaCl
MgSO₄

Images

5°



20°



Conclusion

- In conclusion, fifty-five seeds germinated in conditons similar to those of mars during summer time, however none produced any shoots of leaves or stem. In fact, although in total, 125 seeds germinated, the majority utilised water to stimulate growth, without any of the salts that are inherent to Martian soil. The 21 seeds germinated, that had grown in a salt, all utilised magnesium sulphate, in concentrations of 5 and 10 per cent, although only three did so in near Martian temperatures.
- Therefore the production of food on mars would not be feasible, if the plants used were not grown in controlled conditions.

Conclusion and Evaluation

- The two other salts used in the experiment that are present in Martian soil, magnesium chloride and sodium chloride, did not produce any germinated seeds, and, when forming Martian soil, may work to inhibit magnesium sulphate from fostering growth.
- However, had the experiment also tested Martian atmospheric conditions, the results may have differed. Also, only cress was examined during the experiment, and the results may have differed again if another crop had been used in its place, which may have germinated easily with those particular soil conditions.

Thank You