An investigation into the distribution of PTC receptor alleles in people in Dorset

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Aims :

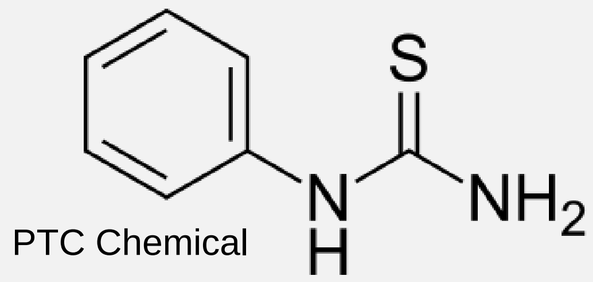
1. Determine the percentage of individuals that are PTC 'tasters', 'non-tasters' and 'supertasters'. Identify whether it demonstrates a Mendelian pattern of distribution.
2. Investigate the relationship between a individual tasting PTC and their preference for cruciferous vegetables.

Materials and Methods :

300 random individuals at school events in October were given paper strips coated in PTC. After tasting, they were asked to define the taste as nothing ('non-taster'), bitter taste ('taster'), or horrible bitter taste ('super-taster'). They were then asked if they enjoyed eating cabbage and brussel sprouts, and this data was recorded.

Background Information :

Phenylthiocarbamide (PTC) is a chemical found in cruciferous vegetables that triggers an isolated bitter taste in the mouth. The ability to taste PTC is determined by a single allele (TAS2R38). The bitter taste allele is co-dominant and inherited in Mendelian pattern. It is expected that 25% of individuals will be 'non-tasters', 50% 'tasters' and 25% 'super-tasters'. It has been suggested that there is a correlation between those who tasted PTC strongly, (dubbed super-tasters) and a dislike for cruciferous vegetables. (*http://learn.genetics.utah.edu/content/basics/ptc/*)



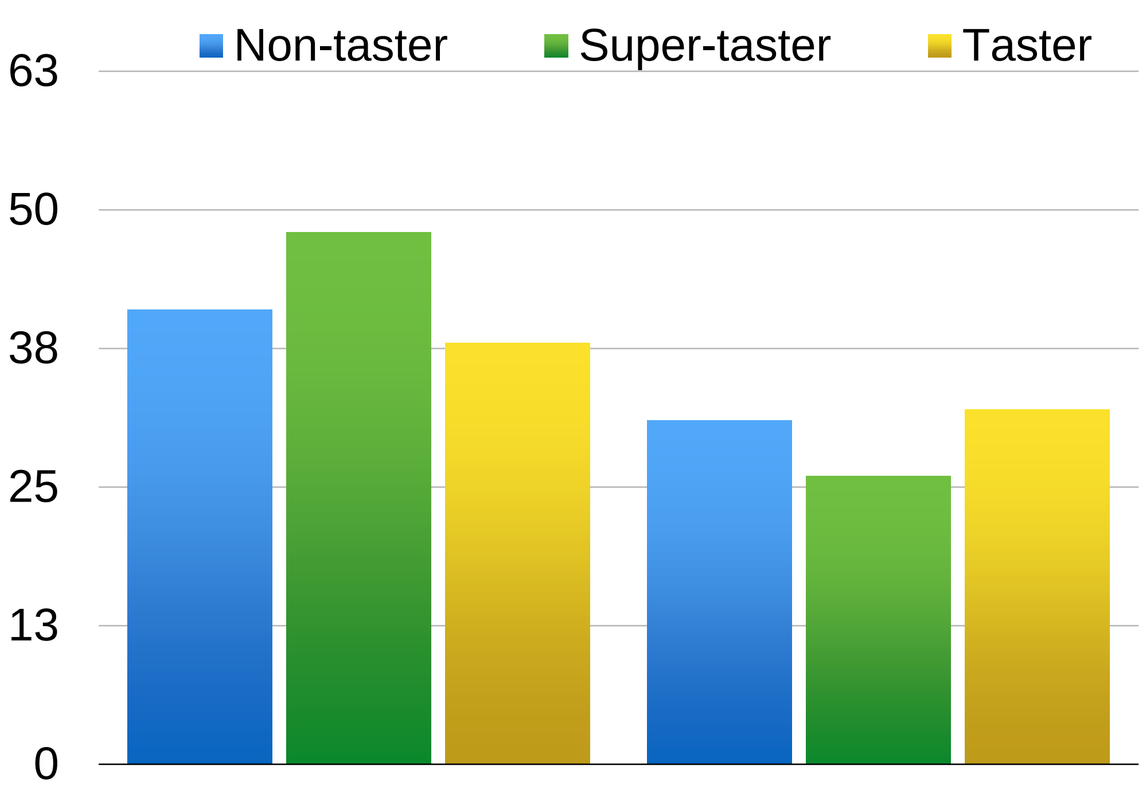
PTC Chemical

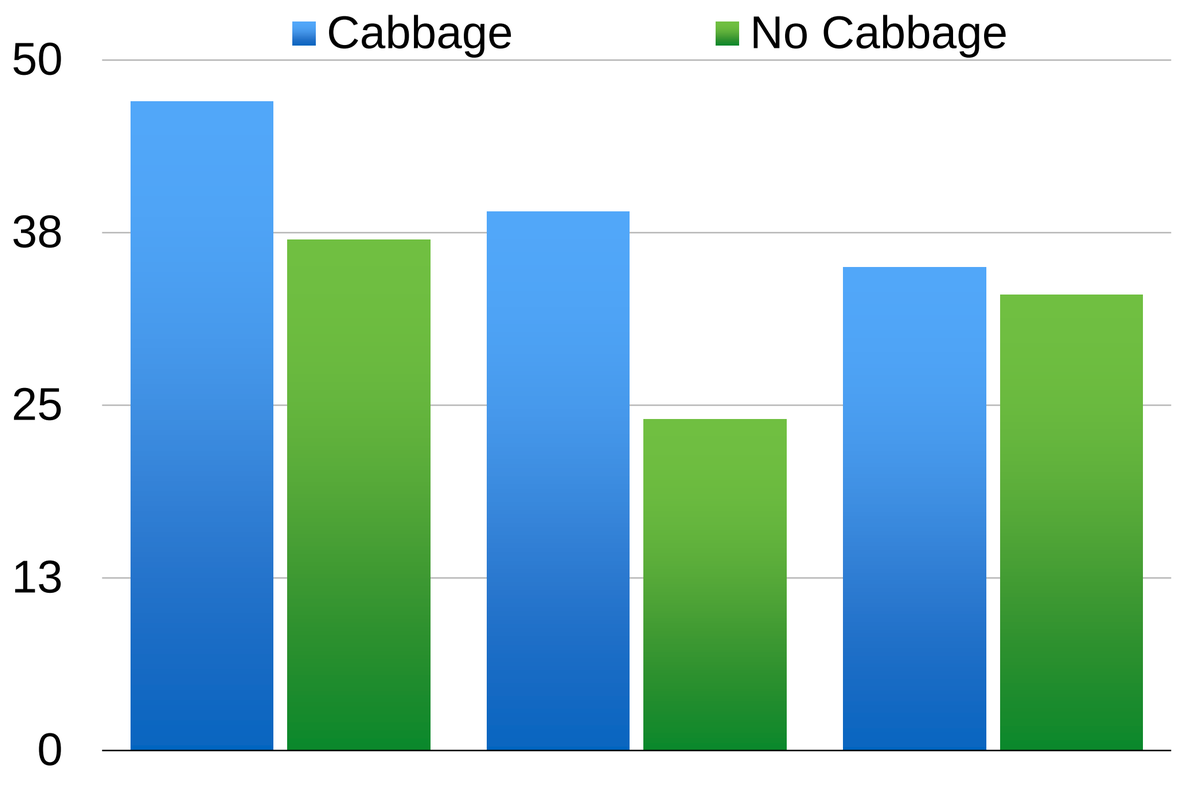
	Female	Male	Total
Non-taster	41	31	72
Super-taster	48	26	74
Taster	38	32	70
Total	127	89	216

Null hypotheses :

H_0: there is a 1:2:1 relationship between 'non-taster':'taster':'super-taster' following a Mendelian pattern.

H_0: There is no correlation between PTC allele type and liking cruciferous vegetables.





Evaluation :

Using the data from our sample we used chi-squared to compare the spread of the PTC allele. The obtained value where χ^2 =26.78 which is deemed significant*, so we accepted our alternate hypothesis.

We also carried out chi squared to compare liking cabbage to taste preference where χ^2 =0.8231, this was deemed insignificant*

**5% significance level, DoF(2) significant value 5.911*

Conclusion :

From our results we have concluded that :

1. PTC allele spread does not follow a Mendelian pattern.
2. There is no significant correlation between PTC taste ability and cruciferous vegetable preference.

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