

## Hong Kong Student Science Project Competition 2022

Template of Extended Abstract (Investigation)

(Word Limit: 1,000 words, Pages: 2 pages only)

Team Number: SBBC247

Project Title: 不同茶種的抗氧化效果 Investigation on antioxidant activity in different types of tea

Project Type: Investigation

To our best knowledge and after thorough literature research, as at 30/06/2022 , there are no\* similar works. If there are, the reference links are as below:

The enhancement our project has made for the existing related products or research is summarized as below:

\*Please delete if not applicable. HKSSPC values the originality of works. Students must conduct literature research thoroughly to ensure that their works are unique, and to list relevant reference materials to complement the research or invention.

### I. Background

Tea is praised for its supposed benefits to physical health due to the presence of antioxidants. indeed based on various reports there are definitely antioxidants present in tea.

Our research is conducted on the basis of Hong Kong, with popular local tea types and brands. While there are various papers on the antioxidant activity and exact compounds of tea from countries such as Kenya and Japan, there are none to our knowledge on tea brands in HK.

### II. Objectives

State the aim(s) of project  
to compare the antioxidant activities of different types of tea commonly sold in Hong Kong

### III. Hypothesis

Propose an explanation for a phenomenon and stating how the hypothesis can be tested by experiments

The common belief in Hong Kong, which states that the darker a tea drink is, the healthier it is. Thus our initial prediction was for brown-black-coloured Pu Erh (a dark tea), to require the most drops of iodine in order to fully react with the starch because of the presumed high concentration of antioxidants; dark brown-coloured Oolong (usually considered a black tea), the second; medium brown-coloured Sau Mei (a white tea) the third, and yellow-coloured Jasmine (usually a green tea) the last.

#### IV. Methodology

List out the materials used

Describe the experimental protocol including the set-up of control experiment (if any), repeated experiment (if any), and its scientific theory

Indicate with the support of reasons, the analysis used in the investigation

Materials: iodine solution, starch solution, standard sodium thiosulphate solution, tea, lab equipment

1. prepare all supplies, including brewing tea with 100°C water and cooling it down to room temperature
2. titrate iodine against thiosulphate and starch solution to find its concentration
3. titrate iodine against mixture of tea and starch solution to calculate antioxidant activity
4. record all results

four sets of experiment data were obtained from four different time periods. In each set, at least 4 titrations were conducted for each tea type, until at least 3 data were of similar accuracy were obtained.

#### V. Results

The activity of each tea type was calculated based on the supposed antioxidant concentration, each based on the antioxidant effect during reaction between iodine and starch. On average, across all trials, jasmine was found to have the highest activity, followed by sau mei, then oolong, and least active was pu erh.

However, we cannot determine the exact antioxidant concentration, and nor can we stimulate the exact environment of the human body to find out the actual direct effects.

#### VI. Conclusion

Make a data-driven conclusion of the project and the way forward of the research  
Justify if the proposed project meets the objective(s)

From a clear colour change in all the tea samples tested through titration, we can clearly reaffirm that antioxidants are indeed present in locally popular tea.

After four sets of experiments, we can conclude the tea with strongest antioxidant activity is jasmine, followed by sau mei, oolong, and at last pu erh. We could conclusively determine that the less oxidised the tea is during production, therefore the lighter the tea is in colour, the stronger its antioxidant activity.

□ Our project is developed based on our school's previous project and the enhancement is as below:

不同茶種的抗氧化效果 Investigation on antioxidant activity in different types of tea (submitted for the HKYSTIC and the Greater Bay Area Science Project 2022)