**Background:**

**Lab Activity: Tongue Tied**

The human tongue has the amazing ability to taste a variety of different molecules. Out of the five basic flavors that it can receive (sweet, salt, bitter, sour and umami) it can create millions of different of flavors.

However, the tastes that the tongue perceives are often manipulated by the nose, brain and environment. Outside influences can control the basic perception of what goes into your mouth and how you experience it.

The Indian herb *Gymnema sylvestre* has been used in traditional Ayurvedic medicine for 2000 years. It has unique properties that will be accentuated in today’s lab. Its chemical form will inhibit the receptors that are used to taste sucrose based substances.

Today we will be putting that to the test. We will try a variety of foods that contain different combinations of flavors and see how it affects our taste buds.

**Materials (per person):**

* Sugar
* Salt
* Smarties
* 4 M&M’s
* 1 packet of Splenda
* A lemon wedge
* 2 cups
  + 1 cup of *Gymnema sylvestre* tea
  + 1 cup of water

**Procedure:**

1. Collect all foods you will need for today’s lab and place them in front of you.
2. Now, fill one cup with the tea and one cup with the water. You may need to refill during the activity.
3. Taste the water and rate it for the perception of sweet, sour, bitter, and salt on a scale of 0-10. A rating of “0” represents no perceived taste whereas a rating of “10” represents a very intense taste. Record your data on table 1.1
4. After tasting, rinse mouth with water to avoid any aftertaste confounds on subsequent ratings.
5. Repeat steps 1-3 for the following foods: salt, Splenda, sugar, M&M’s, lemon and smarties. Make sure that you taste them in this order!
6. Following the initial taste of each substance, swish an ounce of tea in the mouth for 20 seconds and then rinse with water. Make sure you coat all parts of the mouth and tongue with the tea. Spit that tea out into a sink and repeat the step with a new ounce of tea for 20 additional seconds
7. Re-taste and rate each substance (in order) and as instructed in steps 1-3. Record this data on table 1.2.
8. Use the remaining time to clean up all foods and substances. Wipe down your desk with soap and water.

**Data:**

Table 1.1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name of Food | Sweet Rating (0 – 10) | Salty Rating (0- 10) | Bitter Rating (0 – 10) | Sour Rating (0-10) |
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Table 1.2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name of Food | Sweet Rating (0 – 10) | Salty Rating (0- 10) | Bitter Rating (0 – 10) | Sour Rating (0-10) |
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**Results:**

Use the space below to generate a graph that charts your results for each food item. Be sure to graph before and after results for all four flavors being asked.

You may also computer generate a graph if you would like.

Analysis Questions:

1. What was the general taste difference of certain foods before and after the tea?
2. Now that we know how taste bulbs work, how might this affect the taste receptors?
3. What practical purpose might this tea have in the real world?