

**Size and number variation between bracts on  
*Heliconia bihai* and *Heliconia caribaea***

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## ABSTRACT

The purpose of this experiment was to determine which of Dominica's two native *Heliconia* species was larger. The research was compiled and it was established that even though the *Heliconia caribaea* had fewer total bracts, its bracts were significantly larger than those of *Heliconia bihai*.

## INTRODUCTION

The island of Dominica is home to two native species of *Heliconia* plants. The heliconias are an attractive tropical plant with showy inflorescence bracts and banana-like leaves; there are between 200 and 250 different species (Montoso Gardens 2005). The two that are found in Dominica are *Heliconia bihai* and *Heliconia caribaea*. The plants are known for their brightly colored bracts, which are often called "lobster claws" because of their resemblance to a real lobster. The *Heliconia caribaea* are commonly either solid yellow or a deep rich red in color. The bracts of the *Heliconia bihai* are scarlet in color with a yellow rim (Lack et al. 1997). The purpose of this study was to determine which species of *Heliconia* has an overall larger bract size.

## MATERIALS AND METHODS

The research was performed by measuring heliconias along a path extending from the Check Hall River below Springfield Plantation in Dominica to the top of Mount Joy. One hundred individual plants were counted for each species, with 25 of these were randomly selected for measurement. The numbers used to program into the random number generator were two sets of numbers to be generated, 25 numbers per set, and a

number range of one through one hundred. This information outputted two sets of 25 random numbers, one set for each of the species being observed.

Data for the report were collected by recording the random plant numbers on a notepad (or waterproof slate in the rain) and walking the distance of the predetermined path. The first accessible heliconia plant at the start of the path was labeled plant number one and the counting went up the hill from there. The number of bracts and the length of each bract were recorded for all of the plants along the path that fell into the random number sets. To simplify the data, the lengths were measure to the nearest 0.5 centimeter using a ruler.

This same procedure was used for all 25 of the plants in both species and then the data were compiled. Mean bract length was calculated for each plant. These data were used to calculate overall mean number of bracts and the overall average length of the bracts for both of the *Heliconia* species.

## RESULTS

As can be seen by Figures 1 and 2, there seems to be no correlation between the average length of the bracts and the number of bracts found on either *Heliconia bihai* or *Heliconia caribaea*. However, the number of bracts found on *Heliconia caribaea* ( $m=7.64$ ) did differ from the number ( $m=9.24$ ) found on *Heliconia bihai*. Table 1 shows all of the information taken from each *Heliconia bihai*. As can be seen by this table, the average number of bracts found in this species was 9.24 and the average length of all of the bracts was 8.51 cm. The same information about *Heliconia caribaea* can be found in

Table 2. This species has an average of 7.64 bracts per plant and an average bract length of 9.10 cm.

## DISCUSSION

The purpose of this study was to determine if there was a significant difference in bract numbers and size between the two species of *Heliconia* native to Dominica. Based on the data collected, there appears to be a difference in the number of bracts, but not in the mean bract length between *Heliconia bihai* and *Heliconia caribaea*.

The information that was gathered for this report showed that even though there was considerable overlap between the species, the mean number of bracts on *Heliconia caribaea* was noticeable smaller than the mean number found on *Heliconia bihai* ( $t = +2.21$ ,  $df = 48$ ;  $p = 0.016$  (VassarStats, 1998-2005). Thus, the data show that there is a significant difference between the numbers of bracts because the p-value is less than 0.05. However, the mean bract length was not significantly different for the two species ( $p = 0.08$ ).

From the data collected on each plant, it can be assumed that the *Heliconia caribaea*'s bracts are slightly larger and more numerous than that of *Heliconia bihai*. It needs fewer total bracts to reach a higher average bract length, and therefore the bracts that do exist are longer in length. Even though the data collected helps to answer the question posed, a more thorough study of the two species would be needed to verify the findings.

## REFERENCES

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Table 1. Bract length and number on randomly selected plants of *Heliconia bihai* at Springfield, Dominica.

| <i>Heliconia bihai</i> |             |               |      |      |     |      |     |     |     |     |     |   |     |            |       |      |
|------------------------|-------------|---------------|------|------|-----|------|-----|-----|-----|-----|-----|---|-----|------------|-------|------|
| Plant #                | # of Bracts | Bract Lengths |      |      |     |      |     |     |     |     |     |   |     | Avg Length |       |      |
| 2                      | 7           | 13            | 13.5 | 8    | 7   | 6.5  | 7.5 | 4   |     |     |     |   |     |            | 8.50  |      |
| 4                      | 10          | 16            | 11.5 | 10   | 9.5 | 8.5  | 8   | 7.5 | 7   | 6   | 5   |   |     |            | 8.90  |      |
| 5                      | 9           | 16            | 10.5 | 9    | 8.5 | 8    | 7.5 | 6   | 5   | 4.5 |     |   |     |            | 8.33  |      |
| 8                      | 7           | 19            | 12.5 | 10.5 | 7.5 | 9    | 3.5 | 2.5 |     |     |     |   |     |            | 9.21  |      |
| 15                     | 8           | 18            | 10   | 9    | 8.5 | 8    | 7   | 5   | 1.5 |     |     |   |     |            | 8.38  |      |
| 17                     | 6           | 10.5          | 9    | 8    | 6.5 | 7    | 2   |     |     |     |     |   |     |            | 7.17  |      |
| 29                     | 5           | 11            | 8.5  | 6.5  | 6   | 2    |     |     |     |     |     |   |     |            | 6.80  |      |
| 37                     | 8           | 12.5          | 11   | 9    | 8   | 9.5  | 8   | 7.5 | 5   |     |     |   |     |            | 8.81  |      |
| 39                     | 10          | 15            | 10   | 10   | 9.5 | 9.5  | 8   | 8   | 7   | 6   | 5   |   |     |            | 8.80  |      |
| 41                     | 12          | 31            | 15   | 10   | 11  | 9    | 8   | 8   | 8   | 7   | 6.6 | 6 | 2   |            | 10.13 |      |
| 43                     | 11          | 16            | 11   | 9    | 10  | 9.5  | 8   | 7   | 8   | 6.5 | 7   | 4 |     |            | 8.73  |      |
| 54                     | 8           | 16            | 9    | 8.5  | 7   | 7    | 6.5 | 5   | 1.5 |     |     |   |     |            | 7.56  |      |
| 56                     | 10          | 12            | 9.5  | 7    | 9.5 | 6.5  | 7   | 7   | 5.5 | 3.5 | 3   |   |     |            | 7.05  |      |
| 62                     | 7           | 11            | 8    | 7.5  | 7   | 7    | 5   | 4   |     |     |     |   |     |            | 7.07  |      |
| 67                     | 11          | 18            | 11   | 10   | 9   | 9    | 8   | 8   | 6   | 7   | 7.5 | 3 |     |            | 8.77  |      |
| 68                     | 11          | 16            | 10   | 10   | 8.5 | 9    | 8   | 7   | 7.5 | 7   | 6.5 |   |     |            | 8.14  |      |
| 70                     | 11          | 3             | 11   | 9.5  | 9   | 9    | 9   | 8   | 8   | 7.5 | 5   | 4 |     |            | 7.55  |      |
| 71                     | 14          | 18            | 11   | 12   | 9   | 10   | 9   | 8   | 8   | 8   | 8   | 7 | 7.5 | 5          | 4.5   | 8.93 |
| 73                     | 11          | 30            | 17   | 12.5 | 12  | 10.5 | 11  | 9   | 9   | 7   | 8.5 | 5 |     |            | 11.95 |      |
| 75                     | 8           | 10            | 11   | 9.5  | 9   | 9    | 7   | 5   | 4.5 |     |     |   |     |            | 8.13  |      |
| 76                     | 9           | 17            | 11   | 9    | 11  | 9    | 7   | 7   | 6   | 4   |     |   |     |            | 9.00  |      |
| 77                     | 9           | 14            | 9    | 9    | 8   | 8    | 6   | 7   | 4   | 2   |     |   |     |            | 7.44  |      |
| 91                     | 10          | 17            | 12   | 10   | 9.5 | 9    | 9.5 | 7.5 | 8   | 6   | 5   |   |     |            | 9.35  |      |
| 92                     | 8           | 14            | 10.5 | 9    | 8.5 | 9.5  | 7   | 8.5 | 4.5 |     |     |   |     |            | 8.94  |      |
| 94                     | 11          | 18.5          | 10   | 9.5  | 9.5 | 9.5  | 8   | 8.5 | 7   | 7   | 6.5 | 5 |     |            | 9.00  |      |
|                        | 9.24        |               |      |      |     |      |     |     |     |     |     |   |     |            | 8.51  |      |

Table 2. Bract length and number on randomly selected plants of *Heliconia caribaea* at Springfield, Dominica.

| <i>Heliconia caribaea</i> |             |               |      |      |      |      |      |      |     |      |     |   |   |            |       |       |
|---------------------------|-------------|---------------|------|------|------|------|------|------|-----|------|-----|---|---|------------|-------|-------|
| Plant #                   | # of Bracts | Bract Lengths |      |      |      |      |      |      |     |      |     |   |   | Avg Length |       |       |
| 1                         | 5           | 12            | 11   | 6    | 3    | 2    |      |      |     |      |     |   |   |            | 6.8   |       |
| 2                         | 12          | 15            | 13   | 12   | 12   | 11   | 9    | 10   | 9   | 8    | 4   | 3 | 3 |            | 9.08  |       |
| 4                         | 12          | 15            | 13   | 13.5 | 11   | 11.5 | 12   | 10   | 8   | 8    | 9   | 8 | 6 |            | 10.42 |       |
| 6                         | 11          | 15            | 15   | 14   | 13   | 11   | 11   | 10   | 8   | 7    | 7   | 3 |   |            | 10.36 |       |
| 13                        | 7           | 14            | 9    | 12   | 11   | 9    | 7    | 6    |     |      |     |   |   |            | 9.71  |       |
| 15                        | 5           | 11            | 11   | 9.5  | 9    | 5    |      |      |     |      |     |   |   |            | 9.1   |       |
| 21                        | 8           | 2             | 9    | 8.5  | 8    | 12.5 | 11   | 13.5 | 14  |      |     |   |   |            | 9.81  |       |
| 33                        | 14          | 18            | 15   | 16.5 | 14.5 | 14   | 13   | 11.5 | 10  | 10.5 | 10  | 8 | 7 | 5          | 3     | 11.14 |
| 35                        | 4           | 6             | 5.5  | 3    | 1.5  |      |      |      |     |      |     |   |   |            |       | 4     |
| 37                        | 6           | 9.5           | 7.5  | 7    | 4.5  | 2    | 1.5  |      |     |      |     |   |   |            |       | 5.33  |
| 40                        | 4           | 10            | 9    | 8    | 4    |      |      |      |     |      |     |   |   |            |       | 7.75  |
| 43                        | 10          | 16.5          | 15   | 13.5 | 13.5 | 11.5 | 10   | 9    | 7   | 7    | 2   |   |   |            |       | 10.5  |
| 44                        | 9           | 19.5          | 13.5 | 13   | 11   | 11.5 | 10   | 7    | 6.5 | 5    |     |   |   |            |       | 10.78 |
| 50                        | 11          | 13.5          | 12.5 | 13.5 | 10   | 10.5 | 9    | 9.5  | 7.5 | 7    | 6.5 | 5 |   |            |       | 9.5   |
| 54                        | 9           | 16.5          | 12   | 12.5 | 9    | 10   | 7    | 8.5  | 5.5 | 4    |     |   |   |            |       | 9.44  |
| 61                        | 5           | 12            | 11.5 | 8.5  | 7    | 2    |      |      |     |      |     |   |   |            |       | 8.2   |
| 64                        | 5           | 16            | 16   | 11   | 4.5  | 6    |      |      |     |      |     |   |   |            |       | 10.7  |
| 65                        | 7           | 13            | 14   | 11   | 11.5 | 10   | 10.5 | 7.5  |     |      |     |   |   |            |       | 11.07 |
| 66                        | 5           | 13            | 10   | 9.5  | 5.5  | 3    |      |      |     |      |     |   |   |            |       | 8.2   |
| 74                        | 7           | 17            | 15   | 13.5 | 10   | 9.5  | 5    | 4.5  |     |      |     |   |   |            |       | 10.64 |
| 75                        | 11          | 12.5          | 15.5 | 13   | 13   | 12.5 | 13   | 10   | 9   | 8.5  | 7.5 |   |   |            |       | 10.41 |
| 77                        | 6           | 14            | 13.5 | 11   | 8    | 9    | 5    |      |     |      |     |   |   |            |       | 10.08 |
| 80                        | 4           | 12.5          | 10   | 7    | 4    | 2    |      |      |     |      |     |   |   |            |       | 8.38  |
| 84                        | 5           | 12            | 11.5 | 8    | 4    | 2    |      |      |     |      |     |   |   |            |       | 7.5   |
| 85                        | 9           | 16            | 9    | 13.5 | 8    | 12.5 | 6    | 6.5  | 5   | 1    |     |   |   |            |       | 8.61  |
|                           | 7.64        |               |      |      |      |      |      |      |     |      |     |   |   |            |       | 9.1   |

Figure 1. Number of bracts compared to mean bract length on *Heliconia bihai*.

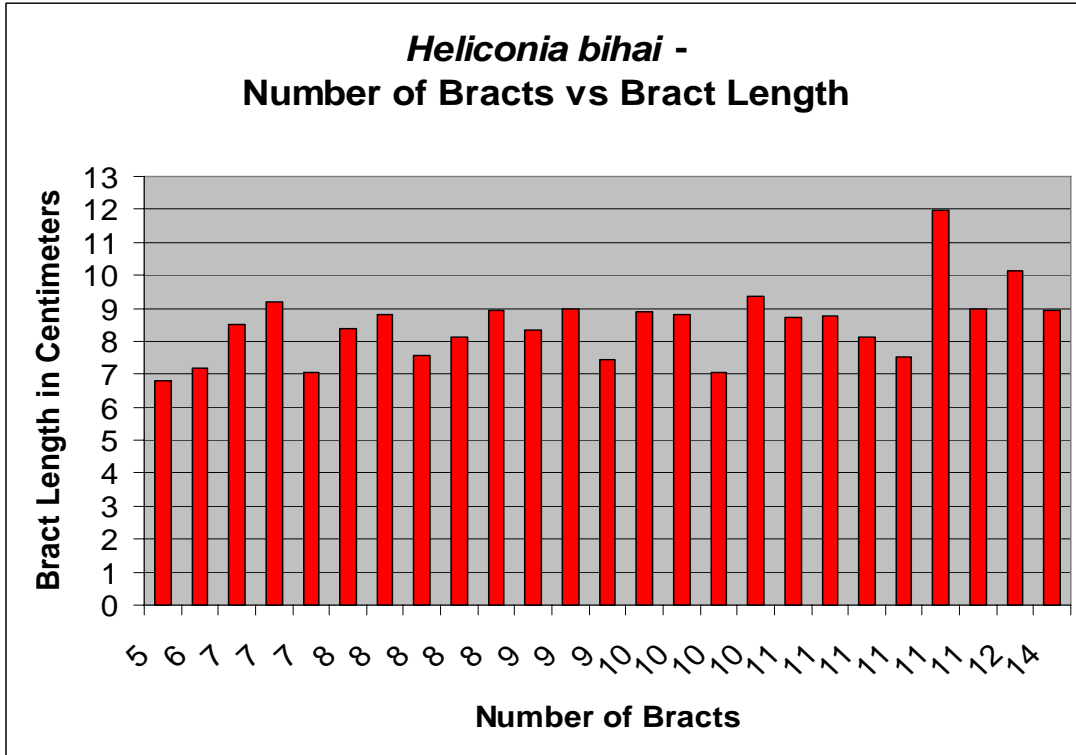


Figure 2. Number of bracts compared to mean bract length on *Heliconia caribaea*.

