

## Original Research Article

### Performance evaluation Growth Traits of pendent *Heliconia* genotypes for growth characteristics under in Kanyakumari conditions

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#### Abstract

*Heliconia* ~~are is~~ one of the important emerging exotic specialty cut flowers which is gaining importance in the Indian markets ~~which and are is~~ used as a cut flower, floral decoration, and ~~also for~~ beautifying gardens. ~~We carried out a~~ field experiment ~~was conducted~~ at Horticultural Research Station, Pechiparai, Kanyakumari to evaluate the performance of pendent *Heliconia* genotypes based on the growth ~~characters~~ characteristics. The results revealed that among the eight genotypes evaluated, ~~*Heliconia* *H. chartacea*~~ 'Surinam Gold' recorded the highest plant height (168.12 cm and 228.32 cm) at 120 and 180 days after planting (DAP) followed by ~~*Heliconia* *H. vellerigera*~~ 'Red' and ~~*Heliconia* *H. chartacea*~~ 'Sexy Pink' which were on par with each other with ~~the~~ maximum number of suckers (8.05 and 8.20 respectively). ~~*Heliconia* *H. vellerigera*~~ 'Red' has the highest stem girth ~~than of~~ the rest of ~~the~~ genotypes.

**Keywords:** Floriculture, *Heliconia* genotypes, specialty cut flower

#### Introduction:

*Heliconia*, a singular genus encompassing around 250-300 species, has earned considerable attention both in Indian and international markets. It is perennial ~~in nature~~, characterized by a sturdy stem and propagation through rhizomes. The name "*Heliconia*" traces its origin back to Greek, paying homage to Mount Helicon, and is derived from the term 'helikonios' by Carl Linnaeus (Malakar and Biswas, 2022). Inflorescences, composed of variedly colored waxy bracts, constitute the hallmark of this flower. These inflorescences can either droop or stand upright, exposing these plants ~~with to~~ a unique opportunity to flourish within the floricultural sector. Emerging as an exotic specialty, *Heliconias* have surged in popularity in Indian markets. Beyond their role in enhancing gardens, they command

significant prices as cut flowers on the global stage. Referred to as lobster claw, false bird of paradise, wild plantains, parrot flower, parrot plantain, or false plantain (Janakiram and Kumar 2011), *Heliconia*s boast year-round inflorescence production across all seasons, rendering them indispensable for exotic floral arrangements. Their spectrum of colors spans red, pink, orange, yellow, and green, coupled with diverse sizes and shapes. Prominent growing regions for *Heliconia*s in India include the West Godavari district of Andhra Pradesh, Kerala, southern Tamil Nadu, Karnataka, Assam, and other northeastern states.

Beyond aesthetics, *Heliconia*s find utility in landscaping due to their lush tropical foliage and an array of inflorescence styles and hues. Additionally, they serve as intercrops in coconut, arecanut, and rubber-based cropping systems, enhancing farmers' profits (Nihadet *al.*, 2016). Notably, the sizable leaves of *Heliconia* species, particularly *Heliconia-H.bihai*, are harnessed to craft eco-friendly bio food wrappers. This innovative packaging solution, including an outer paper covering, caters to busy consumers (Dodampeet *al.*, 2022). Moreover, the folk medicine realm has embraced *Heliconia-H.rostrata* for addressing diabetes and diabetes-related leg swellings (Shahriaret *al.*, 2017). There is a good demand for the flowers and suckers of the pendent-pendant types. On an average in a hectare 88,000 to 1,15,000 flowers can be obtained from 10,000 to 30,000 suckers. Besides an additional revenue can be obtained by the sale of suckers besides flowers. In light of this, the principal objective of the study is to comprehensively evaluate various *Heliconia* genotypes, focusing on their vegetative and growth characteristics.

## Methods and Materials

The current experiment was carried out at Horticultural Research Station, Pechiparai in Kanyakumari district of Tamil Nadu during the year 2022. The study includes eight genotypes of *Heliconia* which are all pendent types. The species includes *Heliconia-H.rostrata* 'Regular', *Heliconia-H.rostrata* 'Ten Days', *Heliconia-H.excelsa*, *Heliconia-H.chartacea* 'Tempress', *Heliconia-H.chartacea* 'Sexy Pink', *Heliconia-H.chartacea* 'Surinam Gold', *Heliconia-H.vellerigera* 'Brown', and *Heliconia-H.vellerigera* 'Red'. The experiment was laid out in Randomized Block Design (RBD) with three replications in open-field conditions. Six-month-old suckers were planted in uniform pits of size 30cm x 30cm x 30cm with a spacing of 1m x 1m and recommended package of practices were followed thereafter. Biometric observations on growth attributes were recorded on 60, 120, and 180 days after post-planting (DAP).

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## Results and Discussion

### Plant height

The genotypes evaluated exhibited significant ( $P < 0.05$ ) difference in the plant height at 60 days intervals (Table 1). Among the genotypes studied, *Heliconia H. rostrata* 'Ten Days' showed maximum ( $P < 0.05$ ) plant height (105.21 cm) which was on par with *Heliconia H. excelsa excelsa* (102.31 cm) and *Heliconia H. vellerigera* 'Brown' (102.85 cm) whereas minimum plant height was observed in *Heliconia H. vellerigera* 'Red' (79.10 cm) at 60 days after planting (DAP). While at 120 and 180 days DAP, *Heliconia H. chartacea* 'Surinam Gold' recorded the a maximum ( $P < 0.05$ ) plant height with 168.12 cm and 228.32 cm respectively whereas *Heliconia H. chartacea* 'Sexy Pink' had a minimum plant height of 81.89 cm and 108.82 cm respectively.

According to Kress (1984), the genus *Heliconia* displays substantial variability, with approximately 422 distinct species identified. Plant height plays a pivotal role in a species' light competition capacity (Moles et al., 2009). In the case of *Heliconia H. psittacorum* cv. *Andromeda* and *Heliconia H. psittacorum* x *Heliconiaspathocircinata* cv. *Golden Torch*, their plant height ranged from 1.0 to 1.8 m, as documented by Broschat et al. (1984). This current study similarly observed notable variations in plant height among the species.

### Number of suckers

The number of sucker evaluated at 60 days intervals among *Heliconia* sp. revealed that *Heliconia H. chartacea* 'Sexy Pink' recorded the highest ( $P < 0.05$ ) number of suckers (3.04) while *Heliconia vellerigera* 'Brown' had no suckers (Table 2). At 120 DAP, a maximum number of suckers was observed in *Heliconia H. vellerigera* 'Red' (6.19) which was on par with *Heliconia H. chartacea* 'Sexy Pink' (6.01) while the minimum number of suckers was observed in *Heliconia H. excelsa* (2.19) and *Heliconia vellerigera* 'Brown' (2.02) respectively. At 180 DAP *Heliconia H. chartacea* 'Sexy Pink' had the highest ( $P < 0.05$ ) number of suckers (8.05) which was on par with *Heliconia H. vellerigera* 'Red' (8.20). The lowest ( $P < 0.05$ ) number of suckers was observed in *Heliconia H. excelsa* (3.17) which was equivalent with *Heliconia H. chartacea* 'Surinam Gold' (3.07). Andersson (1985) and Thangam et al., (2014) noted the presence of extensive variation within the genus *Heliconia*, attributing it to the diverse characteristics of the *Heliconia* family which was observed in the current study also, where substantial variations were also observed.

## Stem girth

The stem girth of eight different *Heliconia* genotypes at 60 days intervals was observed (Table 3). The genotype *Heliconia H. vellerigera* 'Red' has the highest ( $P < 0.05$ ) stem girth with 3.10 cm, 4.01 cm, 5.02 cm at 60, 120 and 180 DAP respectively while *Heliconia H. rostrata* 'Ten Days' had the least value of stem girth (1.90 cm, 2.00 cm and 2.30 cm on 60, 120 and 180 DAP, respectively). Among the *Heliconia* genus, the distinction among interspecific cultivars and hybrids is naturally evident and discernible. This differentiation has been observed and understood through the process of morphological characterization, as elucidated by Berry and Kress (1991).

## Conclusion

The present study revealed that *Heliconia H. chartacea* 'Surinam Gold' displayed the highest plant height at 120 and 180 days after planting (DAP), while *Heliconia H. chartacea* 'Sexy Pink' displayed the lowest plant height. In terms of the number of suckers, *Heliconia H. vellerigera* 'Red' and *Heliconia H. chartacea* 'Sexy Pink' demonstrated similar high counts, while *Heliconia H. excelsa* and *Heliconia H. chartacea* 'Surinam Gold' had the lowest counts. Furthermore, *Heliconia H. vellerigera* 'Red' emerged with the greatest stem girth, while *Heliconia H. rostrata* 'Ten Days' exhibited the smallest stem girth value. Collectively, these findings lead to the conclusion that among the evaluated genotypes, *Heliconia H. vellerigera* 'Red' revealed superior morphological characteristics in terms of growth and sucker production which could be beneficial to the flower growers for obtaining higher flower yield and revenue in terms of suckers.

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**Table1. Plant height (cm) of different Heliconia genotypes under open field condition**

Genotypes	60DAP	120DAP	180DAP
H <sub>1</sub> - <i>Heliconia-H.rostrata</i> 'Regular'	83.05	123.88	178.71
H <sub>2</sub> - <i>Heliconia-H.rostrata</i> 'Ten Days'	105.21	123.07	136.29
H <sub>3</sub> - <i>Heliconia-H.excelsa</i>	102.31	125.69	169.82
H <sub>4</sub> - <i>Heliconia-H.chartacea</i> 'Tempress'	97.48	127.50	150.93
H <sub>5</sub> - <i>Heliconia-H.chartacea</i> 'Sexy Pink'	67.36	81.89	108.82
H <sub>6</sub> - <i>Heliconia-H.chartacea</i> 'Surinam Gold'	86.62	168.12	228.32
H <sub>7</sub> - <i>Heliconia-H.vellerigera</i> 'Brown'	102.85	154.55	180.32
H <sub>8</sub> - <i>Heliconia-H.vellerigera</i> 'Red'	79.10	144.94	184.87
SE.d	<b>1.80</b>	<b>3.61</b>	<b>3.30</b>
CD	<b>3.87</b>	<b>7.75</b>	<b>7.07</b>

**Table2. Number of suckers produced by different Heliconia genotypes under open field condition**

Genotypes	60 DAP	120 DAP	180 DAP
H <sub>1</sub> - <i>H.rostrata</i> 'Regular' H <sub>1</sub> — <i>Heliconia</i>	1.12	3.85	6.06

<i>rostrata</i> 'Regular'			
<u>H<sub>2</sub> - <i>H.rostrata</i> 'Ten Days'</u> <del>H<sub>2</sub>—<i>Heliconia rostrata</i> 'Ten Days'</del>	1.21	3.95	5.22
<u>H<sub>3</sub> - <i>H.excelsa</i></u> <del>H<sub>3</sub>—<i>Heliconia excelsa</i></del>	1.07	2.19	3.17
<u>H<sub>4</sub> - <i>H.chartacea</i> 'Tempress'</u> <del>H<sub>4</sub>—<i>Heliconia chartacea</i> 'Tempress'</del>	1.23	3.05	4.98
<u>H<sub>5</sub> - <i>H.chartacea</i> 'Sexy Pink'</u> <del>H<sub>5</sub>—<i>Heliconia chartacea</i> 'Sexy Pink'</del>	3.04	6.01	8.05
<u>H<sub>6</sub> - <i>H.chartacea</i> 'Surinam Gold'</u> <del>H<sub>6</sub>—<i>Heliconia chartacea</i> 'Surinam Gold'</del>	1.04	5.14	6.07
<u>H<sub>7</sub> - <i>H.vellerigera</i> 'Brown'</u> <del>H<sub>7</sub>—<i>Heliconia vellerigera</i> 'Brown'</del>	0.00	2.02	3.07
<u>H<sub>8</sub> - <i>H.vellerigera</i> 'Red'</u> <del>H<sub>8</sub>—<i>Heliconia vellerigera</i> 'Red'</del>	1.06	6.19	8.20
SEd	<b>0.11</b>	<b>0.23</b>	<b>0.19</b>
CD	<b>0.24</b>	<b>0.49</b>	<b>0.415</b>

**Table3. Stem girth (cm) of different *Heliconia* genotypes under open field condition**

Genotypes	60 DAP	120 DAP	180 DAP
<u>H<sub>1</sub> - <i>H.rostrata</i> 'Regular'</u> <del>H<sub>1</sub>—<i>Heliconia rostrata</i> 'Regular'</del>	2.20	2.60	2.90
<u>H<sub>2</sub> - <i>H.rostrata</i> 'Ten Days'</u> <del>H<sub>2</sub>—<i>Heliconia rostrata</i> 'Ten Days'</del>	1.90	2.00	2.30
<u>H<sub>3</sub> - <i>H.excelsa</i></u> <del>H<sub>3</sub>—<i>Heliconia excelsa</i></del>	2.20	3.30	4.50
<u>H<sub>4</sub> - <i>H.chartacea</i> 'Tempress'</u> <del>H<sub>4</sub>—<i>Heliconia chartacea</i> 'Tempress'</del>	2.80	3.30	4.00
<u>H<sub>5</sub> - <i>H.chartacea</i> 'Sexy Pink'</u> <del>H<sub>5</sub>—<i>Heliconia chartacea</i> 'Sexy Pink'</del>	2.80	3.60	3.81
<u>H<sub>6</sub> - <i>H.chartacea</i> 'Surinam Gold'</u> <del>H<sub>6</sub>—<i>Heliconia chartacea</i> 'Surinam Gold'</del>	2.30	2.60	3.14
<u>H<sub>7</sub> - <i>H.vellerigera</i> 'Brown'</u> <del>H<sub>7</sub>—<i>Heliconia vellerigera</i> 'Brown'</del>	3.10	4.01	5.02
<u>H<sub>8</sub> - <i>H.vellerigera</i> 'Red'</u> <del>H<sub>8</sub>—<i>Heliconia vellerigera</i> 'Red'</del>	2.70	3.02	3.60

<i>vellerigera</i> Red			
SE.d	<b>0.05</b>	<b>0.05</b>	<b>0.18</b>
CD	<b>0.11</b>	<b>0.11</b>	<b>0.38</b>

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