Growth Traits of pendent *Heliconia* genotypes in Kanyakumari conditions

Abstract

Heliconia is one of the important emerging exotic specialty cut flowers which is gaining importance in the Indian markets and is used as a cut flower, floral decoration, and beautifying gardens. We carried out a field experiment at Horticultural Research Station, Pechiparai, Kanyakumari to evaluate the performance of pendent *Heliconia* genotypes based on the growth characteristics. The results revealed that among the eight genotypes evaluated, *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 *H. vellerigera* 'Red' and *H. chartacea* 'Sexy Pink' which were on par with each other with the maximum number of suckers (8.05 and 8.20 respectively). *H. vellerigera* 'Red' has the highest stem girth 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, 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 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 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* 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* in India include the West Godavari district of Andhra Pradesh, Kerala, southern Tamil Nadu, Karnataka, Assam, and other northeastern states.

Heliconia finds utility in landscaping due to its lush tropical foliage and an array of inflorescence styles and hues. Additionally, they serve as intercrops in coconut, areca nut, and rubber-based cropping systems, enhancing farmers' profits (Nihad *et al.,* 2016). Notably, the sizable leaves of *H.* species, particularly *H. bihai*, are harnessed to craft eco-friendly bio food wrappers. This innovative packaging solution, including an outer paper covering, caters to busy consumers (Dodampe *et al.,* 2022). Moreover, the folk medicine realm has embraced *H. rostrata* for addressing diabetes and diabetes-related leg swellings (Shahriar *et al.,* 2017). There is a good demand for the flowers and suckers of the pendant types. On average in a hectare 88,000 to 1,15,000 flowers can be obtained from 10,000 to 30,000 suckers. 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 *H.* 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 2023. The study includes eight genotypes of *Heliconia* which are all pendent types. The species includes *H. rostrata* 'Regular', *H. rostrata* 'Ten Days', *H. excelsa, H. chartacea* 'Temptress', *H. chartacea* 'Sexy Pink', *H. chartacea* 'Surinam Gold', *H. vellerigera* 'Brown', and *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 60, 120, and 180 days post-planting (DAP).

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, *H. rostrata* 'Ten Days' showed maximum ($P<0.05$) plant height which was on par with *H. excels,* and *H. vellerigera* 'Brown'

whereas minimum plant height was observed in *H. vellerigera* 'Red' at 60 days DAP. While at 120 and 180 days DAP, *H. chartacea* 'Surinam Gold' recorded a maximum (P<0.05) plant height whereas *H. chartacea* 'Sexy Pink' had a minimum plant height. Similarly, Malakar *et al.,* (2015) assessed the vegetative and floral characteristics of various *Heliconia* genotypes to determine their usefulness as cut flowers or as landscape plants. They claim that *Heliconia stricta,* has the highest recorded height, followed by *Heliconia wagneriana*. The *Heliconia stricta* var. "Dwarf Jamaican Red" was found to be the shortest

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 *H. psittacorum* cv. *Andromeda* and *H.* x *H spathocircinata* 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 suckers evaluated at 60 days intervals among *Heliconia* sp. revealed that *H. chartacea* 'Sexy Pink' recorded the highest (P<0.05) number of suckers while *H. vellerigera* 'Brown' had no suckers (Table 2). At 120 DAP, a maximum number of suckers was observed in *H. vellerigera* 'Red' which was on par with *H. chartacea* 'Sexy Pink' while the minimum number of suckers was observed in *H. excelsa* and *H. vellerigera* 'Brown'. At 180 DAP *H. chartacea* 'Sexy Pink' had the highest (P<0.05) number of suckers which was on par with *H. vellerigera* 'Red'. The lowest (P<0.05) number of suckers was observed in *H. excelsa* which was equivalent to *H. chartacea* 'Surinam Gold'. 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. Sexy Pink, Temptress, Wagneriana, and other notable cut flower *Heliconia*'s recorded medium to high sucker production per clump (Malakar and Biswas, 2022) which was similar to the present study.

Stem girth

The stem girth of eight different *Heliconia* genotypes at 60 days intervals was observed (Table 3). The genotype *H. vellerigera* 'Red' has the highest (P<0.05) stem girth while *H. rostrata* 'Ten Days' had the least value of stem girth. Among the *Heliconia* genus, the distinction between 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 *H. chartacea* displayed the highest plant height at 120 and 180 days DAP, while *H. chartacea* displayed the lowest plant height. In terms of the number of suckers, *H. vellerigera* 'Red' and *H. chartacea* demonstrated similar high counts, while *H. excelsa* and *H. chartacea* had the lowest counts. *H. vellerigera* 'Red' emerged with the greatest stem girth, while *H. rostrata* exhibited the smallest stem girth value. Among the evaluated genotypes, *H. vellerigera* 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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Table 1. Plant height (cm) of different Heliconia genotypes under open field condition

Genotypes	**60DAP**	**120DAP**	**180DAP**
H_1 - *H. rostrata* 'Regular'	83.05	123.88	178.71
H_2 - *H. rostrata* 'Ten Days'	105.21	123.07	136.29
H_3 - *H. excelsa*	102.31	125.69	169.82
H_4 - *H. chartacea* 'Tempress'	97.48	127.50	150.93
H_5 - *H. chartacea* 'Sexy Pink'	67.36	81.89	108.82
H_6 - *H. chartacea* 'Surinam Gold'	86.62	168.12	228.32
H_7 - *H. vellerigera* 'Brown'	102.85	154.55	180.32
H_8 - *H. vellerigera* 'Red'	79.10	144.94	184.87
SE.d	**1.80**	**3.61**	**3.30**
CD	**3.87**	**7.75**	**7.07**

Table 2. Number of suckers produced by different Heliconia genotypes under open field condition

Genotypes	60 DAP	120 DAP	180 DAP
H_1 - *H. rostrata* 'Regular'	1.12	3.85	6.06
H_2 - *H. rostrata* 'Ten Days'	1.21	3.95	5.22
H_3 - *H. excelsa*	1.07	2.19	3.17
H_4 - *H. chartacea* 'Tempress'	1.23	3.05	4.98
H_5 - *H. chartacea* 'Sexy Pink'	3.04	6.01	8.05
H_6 - *H. chartacea* 'Surinam Gold'	1.04	5.14	6.07
H_7 - *H. vellerigera* 'Brown'	0.00	2.02	3.07
H_8 - *H. vellerigera* 'Red'	1.06	6.19	8.20
SEd	**0.11**	**0.23**	**0.19**
CD	**0.24**	**0.49**	**0.415**

Table 3. Stem girth (cm) of different Heliconia genotypes under open field condition

Genotypes	60 DAP	120 DAP	180 DAP
H_1 - *H. rostrata* 'Regular'	2.20	2.60	2.90
H_2 - *H. rostrata* 'Ten Days'	1.90	2.00	2.30
H_3 - *H. excelsa*	2.20	3.30	4.50
H_4 - *H. chartacea* 'Tempress'	2.80	3.30	4.00
H_5 - *H. chartacea* 'Sexy Pink'	2.80	3.60	3.81
H_6 - *H. chartacea* 'Surinam Gold'	2.30	2.60	3.14
H_7 - *H. vellerigera* 'Brown'	3.10	4.01	5.02
H_8 - *H. vellerigera* 'Red'	2.70	3.02	3.60
SE.d	**0.05**	**0.05**	**0.18**
CD	**0.11**	**0.11**	**0.38**