



Evaluation of heliconia (*Heliconia* spp) genotypes under south Gujarat agro-climatic condition

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ABSTRACT

An experiment was carried out to evaluate 25 genotypes of heliconia (*Heliconia* spp) under 50% shade net during 2008-09 to 2010-11. Wide range of variation among the 25 genotypes of heliconia was recorded with respect to vegetative and floral characteristics. Among the different genotypes, Iris Bannochie (red), Parrot Beak (red with yellow edges), Lobster Claw-II (orange-red), Pedro Ortiz (cherry red), *H. wagneria* Red (red), Orange (crimson) and Golden Torch (yellow) were found ideal for cut flowers and recommended for commercial cultivation and as landscape plant for south Gujarat.

Key words: Bracts, Flowering, Genotypes, Heliconia, Vegetative

Heliconias (*Heliconia* spp) are amongst the most attractive of all the exotic tropical flowering plants which belongs to the family Heliconiaceae and member of a large taxonomic category Zingiberales. It has several common names like Lobster's Claws, Parrot's Flower, Parrot Plantain and False Plantain. Andhra Pradesh, Kerala, Karnataka, Asom and other north-eastern states are the major producers.

Heliconia flowers are the most unusual flora of the tropics and gaining popularity as commercially high value cut flower due to the diversity in their color, form, unusual inflorescence and long vase life. This high value flower crop can be successfully grown with little care and also do fairly well under partial shade or net house or under coconut orchards as intercrop.

Heliconia may also prove as highly remunerative new flower crop for farmers and nurserymen of Gujarat, since the agro-climatic conditions of south Gujarat are more favourable for its cultivation. However, no evidence is available for growing heliconia in Gujarat. Therefore, the present investigation was designed to study the vegetative, quality and yield parameters of various genotypes. This research will also be helpful to find most suitable genotypes for commercial cultivation under south Gujarat and provide information for further breeding programmes and research studies on management practices.

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MATERIALS AND METHODS

The experiment was carried out at the Floriculture Research Farm, Department of Floriculture and Landscape Architecture, ASPEE College of Horticulture and Forestry, Navsari Agricultural University, Navsari which comes under south Gujarat Heavy Rainfall Zone-I, AES-III. Navsari is situated at 20° - 95' North latitude and 75° - 95' East longitude at an altitude of 10 meters above mean sea level. The experimental site is located three kilometres away in the west from Navsari and 12 kilometres away in the east from Arabian seashore, the historical place Dandi. Treatment consisted of 25 genotypes of heliconia, viz. *Heliconia latispatha* Orange, *H. wagneria* Red, *H. chartacea* Sexy Orange, *H. wagneria* Rainbow, *H. stricta* Iris Bannochie, *H. c.* × *H. b.* Lobster Claw- III, *H. collinsiana* Pendula, *H. orthotrica* She, *H. c.* × *H. b.* LC-II, *H. latispatha* Red, *H. latispatha* Distance, *H. psittacorum* Kenea Red, *H. p.* × *H. s.* Tropica, *H. p.* × *H. s.* Allan Carle, *H. p.* × *H. s.* Nickerensis, *H. chartacea* Berg Pink, *H. psittacorum* Andromeda, *H. psittacorum* Lady Di, *H. psittacorum* Red Torch, *H. varabes* Red, *H. carabae* Flash, *H. b.* × *H. c.* Pedro Ortiz, *H. psittacorum* Strawberry, *Heliconia rostrata* Parrot Beak and *H. p.* × *H. s.* Golden Torch. The different genotypes of heliconia were collected from one registered nursery of Trishur (Kerala). Uniform rhizomes with axillary bud of these genotypes were planted on raised beds with spacing of 1.5 m × 1.0 meter under 50% green colour shade net house in 2008. Uniform cultural practices were followed throughout the experiment. Observations were recorded on various vegetative, flowering, quality and yield parameters from five randomly selected plants from each plot. Plant height, leaves/stem and leaf area of third leaf of tallest stem were measured at the end of each

Table 1 Vegetative and flowering parameters as influenced by different genotypes of heliconia

Genotype	Plant height (cm)	No. of leaves/ stem	Leaf area (cm ²)	Days to first flowering	Duration of flowering (days)
<i>Heliconia latispatha</i> Orange	106.87	6.40	712.69	97.40	26.67
<i>H. wagneria</i> Red	311.66	5.20	2234.31	315.00	32.53
<i>H. chartacea</i> Sexy Orange	230.70	5.73	1058.43	764.20	8.47
<i>H. wagneria</i> Rainbow	233.34	4.40	1291.55	323.00	33.53
<i>H. stricta</i> Iris Bannochie	263.63	4.13	1128.39	203.40	46.93
<i>H. c. × H. b.</i> Lobster Claw-III	232.06	5.00	1407.86	312.80	34.27
<i>H. collinsiana</i> Pendula	273.76	5.60	2148.72	319.80	30.53
<i>H. orthotrica</i> She	117.54	4.60	697.15	313.40	30.87
<i>H. c. × H. b.</i> LC-II	190.28	5.00	812.32	311.60	41.27
<i>H. latispatha</i> Red	246.13	5.67	1138.77	123.00	32.20
<i>H. latispatha</i> Distance	251.89	5.13	894.10	140.20	23.67
<i>H. psittacorum</i> Kenea red	160.70	4.27	421.94	190.20	25.33
<i>H. p. × H. s.</i> Tropica	218.05	4.93	808.11	282.20	22.20
<i>H. p. × H. s.</i> Allan carle	256.18	4.67	1220.18	247.20	33.00
<i>H. p. × H. s.</i> Nickerensis	160.33	5.40	427.07	278.80	23.40
<i>H. chartacea</i> Berg Pink	180.85	4.80	689.81	0.00	0.00
<i>H. psittachorum</i> Andromeda	127.77	4.07	326.87	172.80	31.33
<i>H. psittachorum</i> Lady Di	131.05	4.93	285.19	142.80	25.87
<i>H. psittachorum</i> Red Torch	140.59	4.20	363.11	198.00	25.27
<i>H. varabes</i> Red	185.45	4.53	728.91	404.40	13.93
<i>H. carabae</i> Flash	240.98	4.73	763.89	411.00	14.73
<i>H. b. × H. c.</i> Pedro Ortiz	317.41	4.80	3074.47	398.40	30.67
<i>H. psittachorum</i> Strawberry	120.45	4.20	270.38	161.20	19.67
<i>Heliconia rostrata</i> Parrot Beak	201.85	5.80	552.66	277.80	42.07
<i>H. p. × H. s.</i> Golden Torch	201.35	4.47	772.22	154.20	25.73
CD (P=0.05)	15.72	0.59	26.61	18.46	1.74
CV (%)	10.69	16.65	6.76	5.62	8.97

Table 2 Quality and yield parameters as influenced by different genotypes of heliconia

Genotype	Bracts/ rachis	Spikes/ plant	Rachis length (cm)	Stalk length (cm)	Presentability (10)
<i>Heliconia latispatha</i> Orange	5.33 (2.41)	5.47 (2.40)	19.61	51.44	4.25
<i>H. wagneria</i> Red	6.93 (2.72)	3.20 (1.91)	32.85	105.05	7.00
<i>H. chartacea</i> Sexy Orange	4.00 (1.65)	1.07 (1.11)	13.66	49.18	6.75
<i>H. wagneria</i> Rainbow	6.13 (2.57)	3.93 (2.05)	27.85	60.23	6.25
<i>H. stricta</i> Iris Bannochie	5.13 (2.37)	6.73 (2.63)	31.11	64.81	7.50
<i>H. c. × H. b.</i> Lobster Claw-III	5.80 (2.51)	4.87 (2.30)	29.19	62.45	6.00
<i>H. collinsiana</i> Pendula	6.33 (2.61)	6.13 (2.55)	42.14	137.99	6.50
<i>H. orthotrica</i> She	4.67 (2.27)	2.33 (1.67)	23.53	54.13	4.50
<i>H. c. × H. b.</i> LC-II	8.67 (3.02)	5.47 (2.43)	31.67	68.13	7.25
<i>H. latispatha</i> Red	6.73 (2.66)	4.47 (2.19)	36.36	137.39	7.00
<i>H. latispatha</i> Distance	7.33 (2.78)	4.47 (2.16)	32.93	136.43	6.00
<i>H. psittacorum</i> Kenea red	4.73 (2.28)	8.67 (3.02)	20.62	113.27	4.25
<i>H. p. × H. s.</i> Tropica	3.80 (2.07)	6.93 (2.68)	17.79	101.57	4.25
<i>H. p. × H. s.</i> Allan carle	4.33 (2.19)	5.80 (2.46)	21.26	103.27	5.25
<i>H. p. × H. s.</i> Nickerensis	5.13 (2.37)	7.00 (2.71)	18.84	94.29	4.50
<i>H. chartacea</i> Berg Pink	0.00 (0.71)	0.00 (0.71)	0.00	0.00	0.00
<i>H. psittachorum</i> Andromeda	4.67 (2.27)	6.13 (2.56)	14.56	60.80	3.75
<i>H. psittachorum</i> Lady Di	4.80 (2.30)	5.27 (2.39)	15.63	70.14	4.00
<i>H. psittachorum</i> Red Torch	4.27 (2.17)	6.40 (2.57)	17.83	89.32	4.75
<i>H. varabes</i> Red	3.13 (1.75)	1.00 (1.17)	16.43	48.39	4.75
<i>H. carabae</i> Flash	3.20 (1.77)	1.07 (1.19)	15.53	54.45	4.75
<i>H. b. × H. c.</i> Pedro Ortiz	5.33 (2.17)	3.87 (1.89)	32.20	96.57	9.00
<i>H. psittachorum</i> Strawberry	4.33 (2.19)	2.87 (1.83)	17.43	102.75	3.75
<i>Heliconia rostrata</i> Parrot Beak	13.73 (3.75)	7.73 (2.83)	47.79	118.59	8.50
<i>H. p. × H. s.</i> Golden Torch	4.80 (2.29)	13.33 (3.71)	24.42	126.93	4.25
CD (P=0.05)	0.14	0.16	2.47	8.57	
CV (%)	8.17	9.95	14.23	14.10	

*Data in parenthesis are square root transform value.

year. Presentability of flower was measured on 10 points scale considering colour, bracts, rachis length and appearance. Only mean data of pooled analysis of three years (2008-09, 2009-10 and 2010-11) are presented in tables which were analysed in completely randomized block design as suggested by Gomez and Gomez (1984).

RESULTS AND DISCUSSION

Vegetative and flowering parameters

The evaluated genotypes exhibited wide variation for vegetative and flowering attributes (Table 1). It was observed that significantly maximum plant height was recorded by *H. b.* × *H. c.* Pedro Ortiz (317.41 cm) which was at par with *H. wagneria* Red (311.66 cm). The maximum number of leaves (6.40) was recorded in *H. latispatha* Orange followed by *Heliconia rostrata* Parrot Beak (5.80). It is clear from the data that maximum leaf area of third leaf of tallest stem (3074.47 cm²) was recorded in *H. b.* × *H. c.* Pedro Ortiz. Criley and Kawabata (1986) stated that weather and environmental factors such as light and humidity have influence on the timing of leaves and their emergence.

H. latispatha Orange produced significantly advanced flowering (97.40 days) followed by *H. latispatha* Red (123.00 days). The maximum duration of flowering was observed in *H. stricta* Iris Bannochie (46.93 days) followed by *Heliconia rostrata* Parrot Beak (42.07 days). Similar observations were also recorded by Ramachandru and Thangam (2012) and in heliconia. The differences in the vegetative and floral characters might be attributed to the genetic makeup of the species and the environmental conditions. According to Atehortua (1998), plants start flowering after emitting a number of leaves depending on the species or variety. Swarna Priya (2010) also recorded a wide range of variation among the 27 genotypes for morphological characters.

Quality and yield parameters

It is explicit from the data presented in Table 2 that the maximum number of bract per rachis (13.73) was recorded in *H. rostrata* Parrot Beak followed by *H. c.* × *H. b.* LC-II (8.67). Maximum number of spikes per plants (13.33) was recorded in *H. p.* × *H. s.* Golden Torch which was followed by *H. psittacorum* Kenea Red (8.67), Maximum rachis length (47.79 cm) was recorded in *Heliconia rostrata* Parrot Beak followed by *H. collinsiana* Pendula (42.14 cm), while maximum stalk length (137.99 cm) was recorded in *H.*

collinsiana Pendula which was at par with *H. latispatha* Red (137.39 cm) and *H. latispatha* Distance (136.43 cm). Similar results in 10 species of heliconia was reported by Costa *et al.* (2009b).

Rocha *et al.* (2010) also reported wide variation in stem length and inflorescence in seven cultivars of *H. psittacorum* and interspecific hybrids. The variability may be associated to genetic characteristics of genotypes or adaptability to the climatic conditions (Costa *et al.* 2009 a).

Meenakshi *et al.* (2012) also reported wide range of variability in 18 genotypes of heliconia with respect to vegetative and flowering parameters.

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