

**Production and use
of Heliconia in
Pernambuco,
northeast of Brazil**

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plants and landscape design
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Genus *Heliconia* Central and south America
Roberto Burle Marx
Introduction of heliconia in brasilian gardens



Roberto Burle Marx gardens



Recife - BR
started
mainly in
1999

Products
catalogue



Heliconia to as cut flower or as collection



Objective

Evaluated the ornamental characteristics to provide information to use heliconias :

- As cut flowers – agronomic aspects
- To gardens projects
- Conserve the diversity



Heliconia Germplasm Collection

Federal Rural University of Pernambuco state (UFRPE) Brasil

- 52 genotypes
- Atlantic Rainforest Zone
- Northeast Region - Brazil
- Average temperature - 25.1°C
- Average month precipitation 171 mm
- Full sun condition
- Since January 2003
- Randomized block, 4 rep.
- 2 x 3 m and 3.0 m x 4.0 m
- Sprinkling irrigation system



Clump characteristics

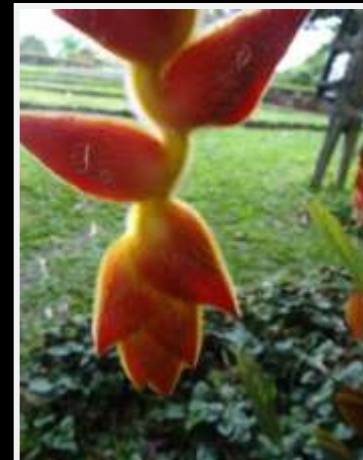
- Height
- Growth habit
- Clump base and area projection
- Shoots number
- Shoots in the internal part
- Inflorescence number
- Bending down tendency





Inflorescences and bracts

- Erect or pendent
- Color
- Shape
- Arrangement
- Weight
- Length
- Number of flowers
- Insects occurrence



Selection aspects to heliconia as cut flower

Results and discussion

Suggested	Aspects	Not recommended
<u>Propagation, clump and plant aspects</u>		
>70%	rhizome viability 3 months after	< 50%
>50 SH, >30 TH?	number of shoots/clump/1°year	<50 SH, <30 TH?
>40 SH, >20 TH?	inflorescence/clump/1°year	>40 SH, >20 TH?
> 75%	death of the shoot apex	< 50%
grouped	clump area x growth habit	open
presence	internal shoots	absence
annual	flowering period	seasonal
<150	flowering cycle	>150
<u>Inflorescence aspects</u>		
upright or pendent	inflorescence type	–
< 30 cm	inflorescence width	> 40 cm
< 50 cm	inflorescence length	> 50 cm
support itself	rachis length and diameter	falling down or break
absence	hair presence	presence
absence	wax presence	presence
0,80 to 1,5 m	flower stem height	<0,8 and > 1,5 m
< 3 cm	flower stem diameter	> 3 cm
< 200 g	flower stem weight	> 200 g
one plane	bracts arrangement	spiraled
vibrant, exotic	bracts color	–
presence	bracts firmness	absence
absence	bracts depth x aquatic habitat	presence
< 5 ?	flowers number	> 10 ?
not necessary	flowers removal	necessary
absence	aquatic invertebrates insects	presence
absence	odors	presence
> 10 days	post-harvest durability	< 7 days

*SH – short heliconia, TH - tall heliconia



Selection aspects to heliconia as ornamental plant

Results and discussion

Suggested	Traits	Not recommended
>50 SH, >30 TH?	number of shoots/clump/1°year	<50 SH, <30 TH?
>40 SH, >20 TH?	inflorescence/clump/1°year	>40 SH, >20 TH?
>4 SH, >2 TH?	inflorescence/clump/month	<4 SH, <2 TH?
grouped or open	clump area x growth habit	–
presence	internal shoots	absence
–	clump height	–
less than one year	commencement of flowering stage	more than one year
annual	flowering period	seasonal
<150	flowering cycle	–
upright or pendent	inflorescence type	–
one plane or spiraled	bracts arrangement	–
visible or partial visible	inflorescence visualization	hardly visible
> 30 days	inflorescence in the clump	< 30 days
good	ornamental aspect of the clump	poor
low	clump maintenance requirements	high
support itself	stem	falling down or break
absence	hair on leaves or inflorescences	presence
absence	wax on leaves or inflorescences	presence
vibrant, exotic	bracts color	usual
absence	bracts depth x aquatic habitat	presence
< 5	flowers number	> 10
>4 SH, >6 BH	bracts number	<4 SH, <6 BH
absence	aquatic invertebrates insects	presence
absence	odors	presence
different	leaf color	–



*SH – short heliconia, TH - tall heliconia

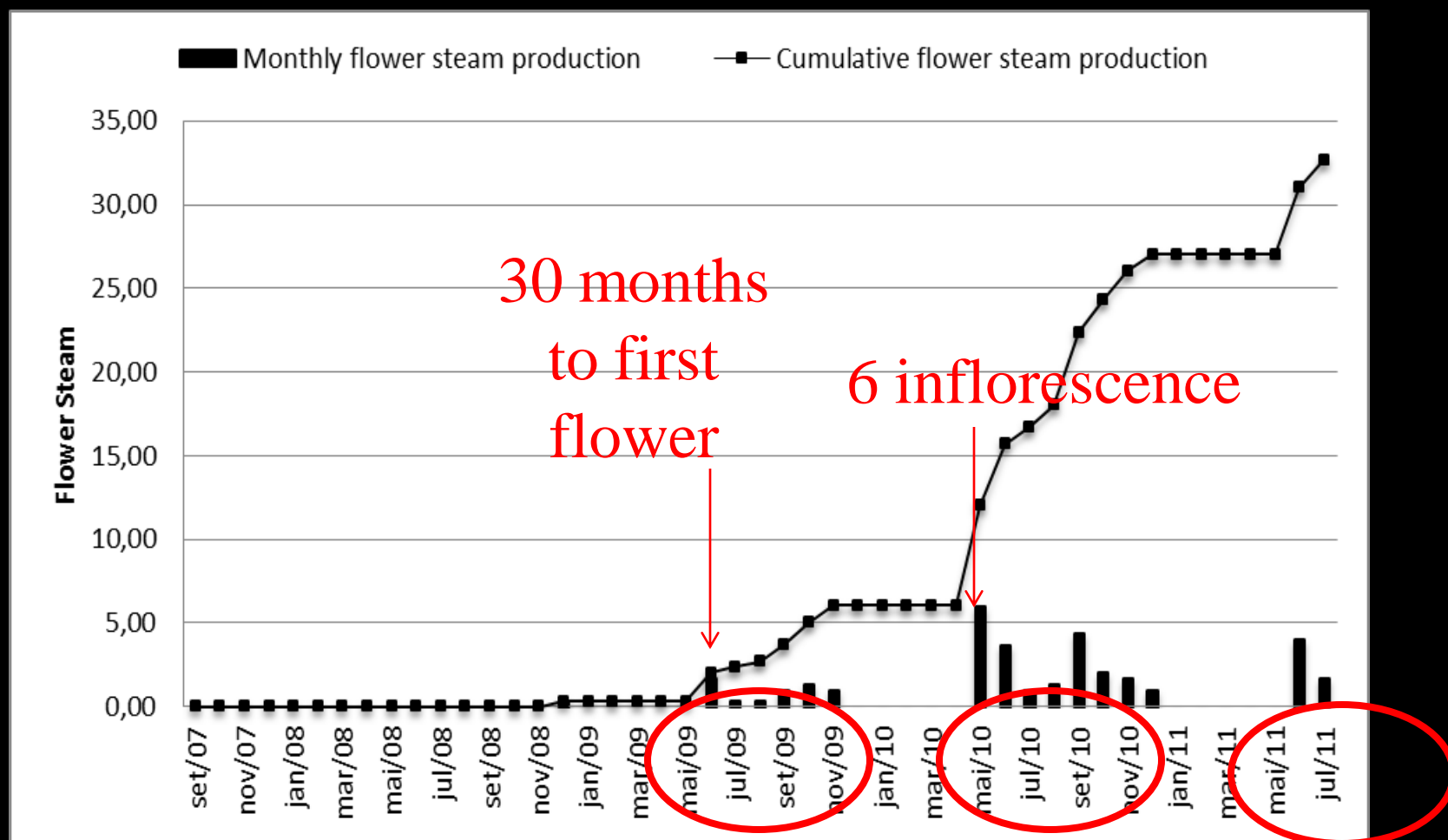
Heliconia pogonantha

- Pendent inflorescence
- Dark red and spiraled bracts
- Partially inflorescence visualization
- Remove old and dry leaves
- Green leaf color
- Dark red bracts color in one plane
- Hair in the inflorescence
- Wax in the leaf
- Quality in the clump

exotic ornamental aspects



Heliconia pogonantha monthly and cumulative flower steam emission, 54 months after planting (MAP). Heliconia Germplasm Collection -UFRPE, Brazil



Shoot emission to inflorescence emergence - 396 days
Inflorescence emergence to harvesting - 19 days
Flowering cycle - 417 day long cycle genotype
Long cycle genotype



- 3 m plants height
- 1.44 m flower stem height
- 25 cm inflores. width
- 50 cm inflores. Length (5 bracts)
- 3.7 cm stem diameter
- 460 g stem weight
- Post harvest durability-13 days
- Got dark very quickly
- Bracts and rachis firmness

Could be indicated as
ornamental plant



Less insects occurrence

No odors

No flowers removal

X

Color bracts

Spiraled bracts arrangement

Difficult packing flowering stems

Reduce the possibilities *Heliconia pogonantha* use as cut flower.



Conclusion

Heliconia pogonantha could be used as ornamental plants. Nevertheless is necessary bread some aspects to be use as:

- reduce the flowering cycle
- increase the production
- reduce flowering stems weight
- no wax and hair;
- bracts arranged in one plane

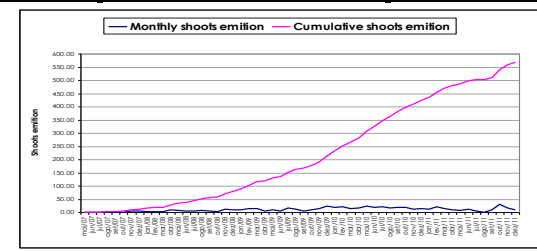
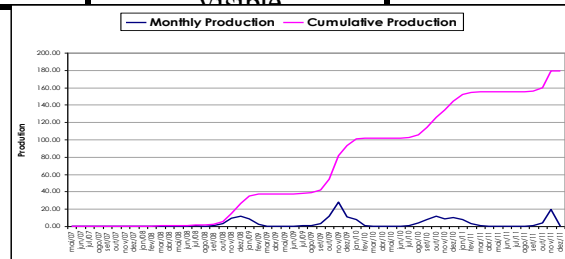


*Heliconia
episcopalis*



Heliconia episcopalis

Aspects	Suggested	Not recommended	Observed	Indication
Cumulative Shoots/Clump (CSC)	>80	<80	567	Positive
Cumulative Flower Stem/Clump (YIELD)	>50	<40	179	Positive
Shoots develop in inflorescences (SDI%)	> 65%	< 50%	33,82%	Negative
Commencement of flowering stage (CFS)	< one year (early flowering)	> one year	13 MAP	-
		(late flowering)		
Flowering period (FP)	Annual	Seasonal	Seasonal (July to February)	-
Clump height (CH)	-	-	1.17	Positive
Internal shoots (IS)	Presence	Absence	Presence	Positive
Growth Habit (GH)	Grouped	Open	Open	Positive
Clump base area (CBA)	<2.5 m ²	>2.5 m ²	3.64 m ²	-
Clump projection area (CPA)	-	-	6.74 m ²	-
Bending Down Tendency (BDT)	Absence	Presence	Absence	Positive
Clump maintenance requirements (CMR)	Low	High	Low	Positive
Inflorescence type (IT)	Upright or pendent	-	Upright	Positive
Bracts arrangement (BA)	One plane	Spiraled	One plane (very closed bracts)	Positive
Bracts color (BC)	Vibrant, exotic	-	Yellow to orange	Positive
Inflorescence visualization (IV)	Visible or partial visible	Hardly visible	Visible	Positive



Heliconia episcopalis

Aspects	Suggested	Not recommended	Observed	Indication
Hair in the inflorescence or Leaves (HAIR)	Absence	Presence	Absence	Positive
Wax in the inflorescence or Leaves (WAX)	Absence	Presence	Absence	Positive
Inflorescence durability in the clump (IDC)	> 30 days	< 30 days	159 days	Positive
Bracts number in the clump (BNC)	>6	<6	10 or more	Positive
Flowering cycle (FC)	<150 days	>150 days	308 days	Negative
Inflorescence emergence to harvesting (IEH)	-	-	22 days	Positive
Height of flowering stem (HFS)	0.80 to 1.5 m	<0.8 and > 1.5 m	0.88 m	Positive
Inflorescence width (IW)	< 0.30 m	> 0.30 m	0.04 m	Positive
Inflorescence length (IL)	< 0.50 m	> 0.50 m	0.10m	Positive
Diameter of flowering stem (DFS)	< 30 mm	> 30 mm	1.55 cm	Positive
Weight of flowering stem (WFS)	< 0.20 kg	> 0.20 kg	0.11 kg	Positive
Post-harvest durability (PHD)	> 10 days	< 7 days	9 days	Positive
Bracts firmness (BF)	Presence	Absence	Presence	Positive
Rachis firmness (RF)	Support itself	Falling down or break	Support itself	Positive
Bracts depth (BD)	Absence	Presence	Absence	Positive
Aquatic insects occurrence (AIO)	Absence	Presence	Absence	Positive



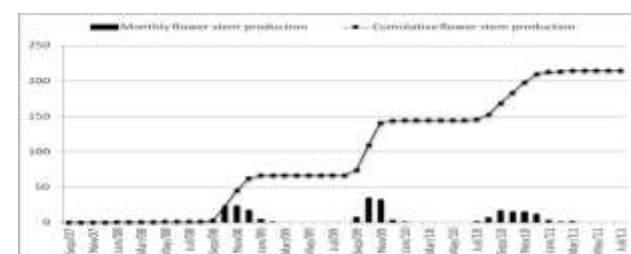
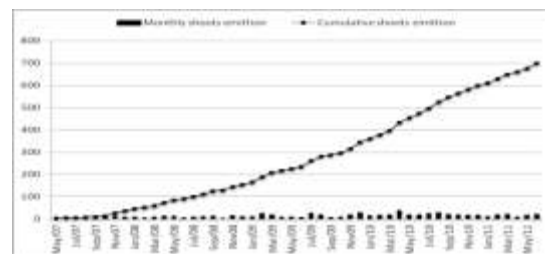
Heliconia rauliniana



Heliconia rauliniana



Aspects	Suggested	Not recommended	Observ.	Classific.
Total number of shoots/clump	>80	<80	698	Positive
Inflorescence/clump	>50	<40	227	Positive
Clump area	<2.5 m ²	>2.5 m ²	3.11m ²	Intermedi
Internal shoots	Presence	Absence	Presence	Positive
Commencement of flowering stage	Less than one year	More than one year	9 MAP	Positive
Flowering period	Annual	Seasonal	Seasonal	Improve
Flowering cycle	<150 days	>150 days	290 days	Intermedi
Inflorescence type	Upright or pendent	-	Upright	Positive
Clump height	-	-	2.8m	Positive
Inflorescence width	< 30 cm	> 40 cm	0.34	Intermedi
Inflorescence length	< 50 cm	> 50 cm	0.35	Positive
Rachis length and diameter	Support itself	Falling down or break	Support	Positive
Hair in the inflorescence	Absence	Presence	Presence	Indifferent
Wax in the inflorescence	Absence	Presence	Absence	Positive
Height of flowering stem	0,80 to 1,5 m	<0,8 and > 1,5 m	1.35	Intermedi
Diameter of flowering stem	< 3 cm	> 3 cm	3 cm	Positive
Weight of flowering stem	< 0.20 kg	> 0.20 kg	0.23 kg	Intermedi



Aspects	Suggested	Not recommended	Observ.	Classific.
Bracts arrangement	One plane	Spiraled	One plan	Intermedi
Bracts color	Vibrant, exotic	–	Red	Positive
Bracts firmness	Presence	Absence	Presence	Positive
Bracts depth x aquatic habitat	Absence	Presence	Absence	Positive
Flowers number	< 5	> 10	9	Intermedi
Flowers removal	Not necessary	Necessary	Not	Positive
Aquatic insects occurrence	Absence	Presence	Absence	Positive
Odors	Absence	Presence	Absence	Positive
Post-harvest durability	> 10 days	< 7 days	11 (4.8	Positive
Inflorescence durability in the clump	> 30 days	< 30 days	73	Positive
Bracts number in the clump	>6	<6	10 or	Positive
Inflorescence visualization	Visible or partial visible	Hardly visible	Visible	Positive
Clump maintenance requirements	Low	High	Low	Positive
Ornamental aspect of the clump	Good	Poor	Good	Positive

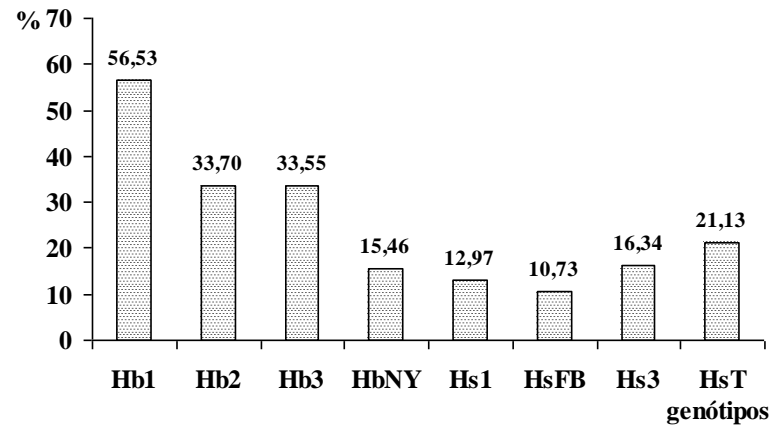
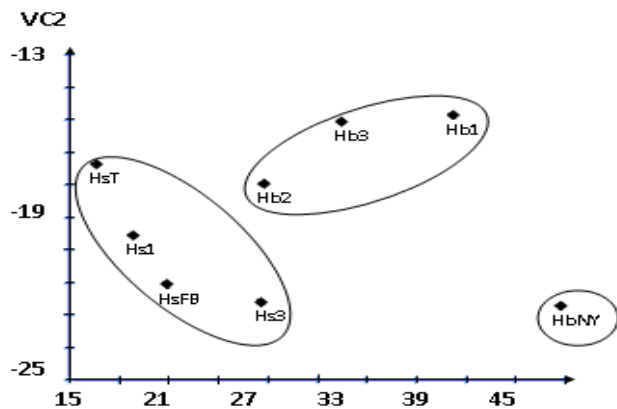
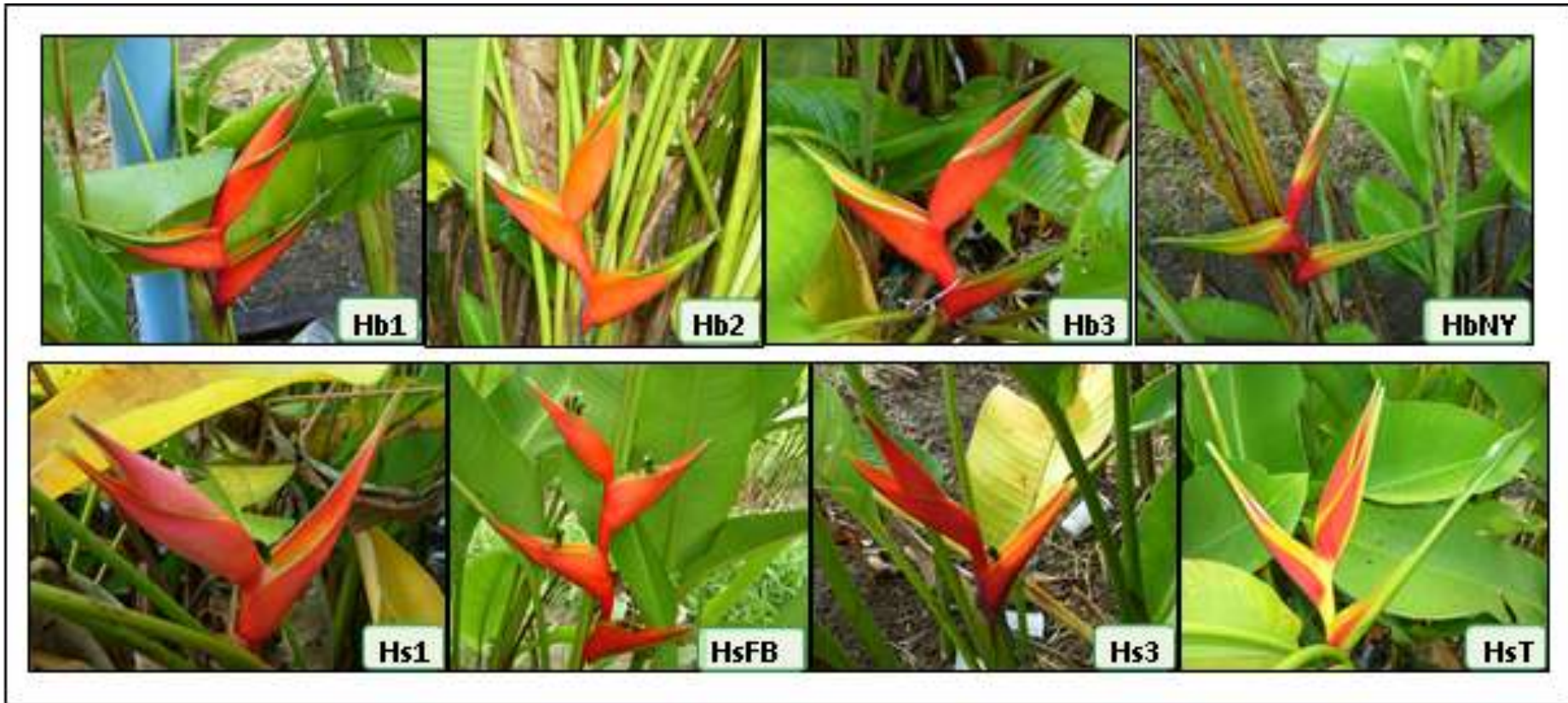


Five years observation of *H. bihai* e *H. stricta* (january 2007 to january 2011).

Genótipos	IF (dias)	NFH	NDEI (dias)	NDCI (dias)	CPP (dias)	CH (cm)	CI (cm)	LI (cm)	DH (mm)	MF (g)	DPC (dias)
Hb1	260.33 B	4.00 B	182.00 B	21.33 B	204.00 B	75.00 B	27.00 A	23.33 A	20.33 B	208,67 B	11.00 A
Hb2	406.00 B	5.00 A	231.00 A	16.00 D	252.33 A	75.33 B	22.00 B	18.67 B	21.33 B	219,00 B	12.00 A
Hb3	311.33 B	5.00 A	191.00 B	18.67 C	211.00 B	73.33 B	25.00 A	21.33 B	21.67 B	210,33 B	10.67 A
HbNY	360.00 B	4.00 B	239.67 A	24.33 A	265.67 A	97.67 A	26.33 A	25.67 A	24.67 A	261,00 A	12.67 A
Hs1	443.33 A	4.33 B	204.00 B	10.67 E	214.67 B	74.33 B	21.67 B	19.00 B	20.00 B	115,67 C	7.00 B
HsFB	564.67 A	4.00 B	236.67 A	11.33 E	247.67 A	77.33 B	22.00 B	20.00 B	20.67 B	130,33 C	8.00 B
Hs3	521.00 A	4.67 A	235.00 A	14.00 D	248.33 A	82.67 B	26.00 A	21.00 B	23.67 A	159,33 C	8.67 B
HsT	390.33 B	5.00 A	251.67 A	13.33 D	263.67 A	94.00 A	27.33 A	25.33 A	22.67 A	203,00 B	8.67 B



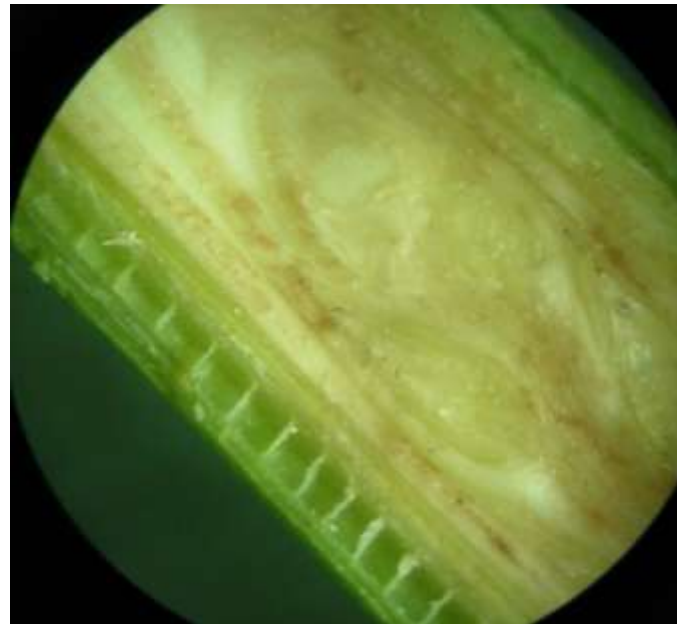
Five years observation of *H. bihai* e *H. stricta* (january 2007 to january 2011).



Identification of shoot apex stage

Number of leaves

Meristem stage: vegetative or reproductive



Post-harvest durability – more than 12 days



Less susceptibility to low temperature



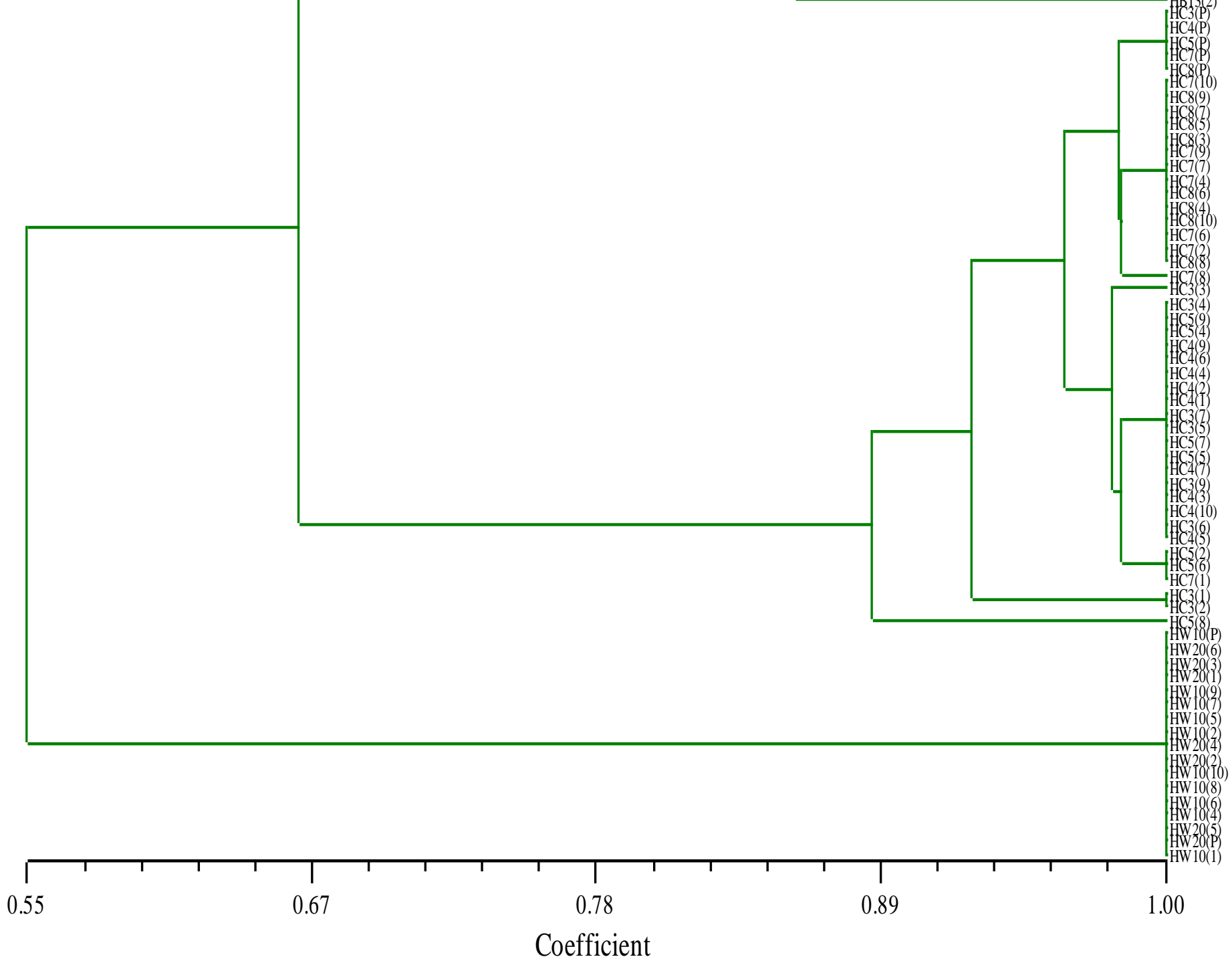
Embrios cultivation – Seeds collecting



In vitro seeds cultivation



- Half brothers family
 - *H. bihai*,
 - *H. chartaceae*
 - *H. wagneriana*



This was only possible because of Research Floriculture Group

Start: 2001

Partners institutions - EMBRAPA, IAC, UFPE

Members:

10 researchers

12 professors

02 Post-doctors

15 students

PRODUCATORS

more than *18 aproved projetos*





Thanks to all of you and

Group of floricultura lab.

UFRPE



*Banco do
Nordeste*



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