

## THE GENUS *HELICONIA* L. CULTIVATED IN BANGLADESH

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### Abstract

The heliconias, now widely grown in Bangladesh as ornamental plants, have been classified into eight species with four cultivars, and two hybrids. Dichotomous bracketed keys to the taxa, detailed taxonomic descriptions with colour photographs, time of flowering and distribution have been provided. English names and chromosome numbers have also been furnished wherever available.

### Introduction

The family Heliconiaceae consists of a single rather large genus *Heliconia* L., with 100 or more species, native mainly to tropical and subtropical South and Central America (Cronquist 1981). The name *Heliconia* is derived from Helicon, a mountain in southern Greece regarded by the ancient Greeks as the home of the Muses, thus suggesting the relationship between these plants and the bananas, genus *Musa* (Berry and Kress 1991). Unique features of the Heliconiaceae are (1) medium to large erect herbs rising from underground rhizomes; (2) each erect shoot is composed of a stem and leaves, whereas the stem is made up of an axis covered by overlapping sheathing leaf bases, technically called a pseudostem; (3) inverted flowers; and (4) the presence of a single staminode. They mainly propagate by clump and rhizome divisions.

Although heliconias are native only to Central and South America and some of the islands of the South Pacific, for horticultural and commercial popularity, they are now being grown in nearly all of the tropical regions of the world, including Africa and Asia. By now many species of *Heliconia* are also introduced and widely grown in Bangladesh, mainly for their ornamental value.

Several attempts have been made over the years to sort out the taxonomy of the Old World *Heliconia*. Baker (1893), followed by Schumann (1900) and Winkler (1930), dealt with the problem of identity and origin of these taxa by assigning them to the neotropical species *H. bihai* (L.) L. Others such as Ridley (1908a, b), Backer (1920) and Green (1969) recognized the distinctive and endemic features of the paleotropical taxa that separated them from the neotropical species.

The recent taxonomic treatment of the *Heliconia* of Costa Rica (Daniels and Stiles 1979) emphasizes the need for critical field observations and photographs of live specimens *in situ*, since in most cases some characteristic features are absent from dried herbarium collections.

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There is so far no taxonomic work has been done on the family Heliconiaceae of Bangladesh. The present work, therefore, is the first attempt on the comprehensive taxonomic studies of heliconias grown in Bangladesh.

### Materials and Methods

The present work is mainly based on the living materials collected from different areas of the country and planted in the Botanical Garden, University of Dhaka, for critical observations and studies. After a critical study of all the collected materials artificial dichotomous keys to the taxa have been prepared for easy identification. Brief notes on nomenclature, detailed taxonomic description, time of flowering and distribution have also been provided under each taxon. The species, hybrids and cultivars are identified with the help of the Heliconia Society Website ([www.heliconia.org](http://www.heliconia.org)), Heliconia Society International, and Berry and Kress (1991). All the collected materials are kept in Dhaka University Herbarium (DUH).

### Results and Discussion

In the present work, eight species with four cultivars, and two hybrids of *Heliconia* have been treated.

**Heliconia** L., Mant. Pl. 2: 147, 211 (1771).

Medium to large erect herbs with underground rhizomes, acaulescent or with slender, unbranched aerial stem (pseudostem). Leaves simple, exstipulate, with basal sheath and long petiole, midrib prominent, numerous lateral veins in a pinnate-parallel arrangement, the lateral veins extending to the margin. Inflorescence terminal, has either an erect or pendent orientation, with large coloured bracts, in one plane (distichous) or spirally arranged due to twisting of the rachis, boat-shaped, each bract subtending a compact, few-flowered monochasial cyme (cincinni). Flowers perfect, bisexual, irregular, epigynous. Perianth segments 6, in 2 cycles, sepals 3, petals 3 (sepals and petals scarcely differentiated), 2 sepals and 3 petals united, remaining sepal free, all petaloid. Stamens 5, functional, inserted, anthers oblong, basifixed, opening by longitudinal slits, 6<sup>th</sup> stamen is a small staminode adnate to the odd tepal. Carpels 3, syncarpous, ovary 3-celled, inferior, ovule solitary in each cell, placentation basal-axile, style slender, furrowed, stigma wet, papillate. Fruit a schizocarp or a drupe, separating into 3-(2)-1-seeded parts.

### Key to the *Heliconia* taxa cultivated in Bangladesh

- |  |   |  |
|--|---|--|
| 1. Inflorescence pendent or contorted  | 2 |  |
| - Inflorescence erect  | 3 |  |
| 2. Inflorescence pendent, cincinnal bracts bright red with yellow-green tip and green margin |   | <b>H. rostrata</b>                           |
| - Inflorescence contorted, cincinnal bracts maroon all through                               |   | <b>H. bourgaeana</b> × <b>H. collinsiana</b> |

- |   |   |
|---|---|
| 3. Leaf sheaths and the lower surface of leaf blades purplish-maroon  | <b>H. metallica</b>                               |
| - Leaf sheaths and the lower surface of leaf blades green   | <b>4</b>  |
| 4. Leaves like those of banana (musoid)   | <b>5</b>  |
| - Leaves like those of ginger (zingiberoid), leaves linear to lanceolate; bracts tip pointed  | <b>H. aurantiaca</b>                              |
| 5. Flowers with distal dark green or black band   | <b>H. psittacorum</b>                             |
| - Flowers without distal dark green or black band   | <b>6</b>  |
| 6. Basal bract usually with green leaflet (second bract with or without a green keel)   | <b>H. latispatha</b>                              |
| - Basal bract without green leaflet, but with a green keel  | <b>7</b>  |
| 7. Tepal apex round   | <b>H. stricta</b>                                 |
| - Tepal apex acute  | <b>8</b>  |
| 8. Leaves obovate-oblong; cincinnal bracts yellow   | <b>H. psittacorum</b> × <b>H. spathocircinata</b> |
| - Leaves ovate-oblong or linear-lanceolate  | <b>9</b>  |
| 9. Leaves ovate-oblong; bracts usually more than 5, bright rose-red with green tip, lip dark green distally with whitish line above | <b>H. bihai</b>                                   |
| - Leaves linear-lanceolate; bracts usually less than 5, reddish-orange  | <b>H. densiflora</b>                              |

### Taxonomic enumeration

The *Heliconia* taxa in the text are arranged alphabetically.

1. ***Heliconia aurantiaca*** Ghiesb. *ex* Lem., *Illustr. Hort.*: 9. t. 332 (1862). *Bihai aurantiaca* (Ghiesb.) Griggs, *Bull. Torr. Bot. Club*: 445 (1904). (Pl. 1, Fig. 1)

*English name*: Aurantic heliconia.

A zingiberoid-type, perennial herb with rhizomatous underground stem, c 1.5 m tall. Pseudostem green, c 2 cm in diameter. Leaves simple, sheaths green to greenish-orange, petiolate, petioles c 3.5 cm long, lamina 6-28 × 3-6 cm, linear to lanceolate, acute to acuminate, entire, midrib green. Inflorescence one per shoot, c 20 cm long, terminal, erect, distichous, a raceme of many-flowered monochasial cymes (cincinni), cincinnal bracts orange with pale green tip, turning green with age. Flowers pedicellate, pedicels c 1 cm long, orange, bracteate, bracts 3-6, c 6 cm long, tip pointed, first bract without flower, flowers inverted, 5 or more per bract, yellow, acute at the apex, rachis orange. Tepals 6, in 2 cycles, c 5 cm long. Stamens 5, filaments c 2.5 cm long, anthers 2-celled, c 1 cm long, staminode c 0.6 cm long, acuminate, shallowly tri-dentate. Carpels 3, ovary 3-celled, c 0.4 cm in diameter, off-white with yellow or green edge, ovule solitary in each cell, placentation axile, style 1, 3.7 cm long, off-white, stigma yellow. Fruit a schizocarp or drupe. Seeds 1-3 per fruit. *Flowering time*: December-June.

*Chromosome number*: 2n = 24 (Fedorov 1969).

*Distribution:* Mexico to Panama, Barbados, and USA (Florida, Hawaii) (Berry and Kress 1991).

*Specimen examined:* **Dhaka:** Baldah Garden, 19.04.2007, Nahid Sultana 20 (DUH).

2. **Heliconia bihai** (L.) L., Mant. 2: 211 (1771). *Musa bihai* L., Sp. Pl.: 1043 (1753); *H. humilis* Jacq., Hort. Schoenz. 1: 23 (1804); *Bihai luteofusca* O. Kuntze, Rev. Gen.: 684 (1891); *B. bihai* (L.) Griggs, Bull. Torr. Bot. Club: 445 (1904). (Pl. 1, Fig. 2)

*English names:* Crab claw, Lobster claw, Macaw flower.

A musoid-type, perennial herb with rhizomatous underground stem, c 3 m tall. Pseudostem greenish-brown, c 3.5 cm in diameter. Leaves simple, petiolate, petioles c 32 cm long, lamina 50-60 × 20-22 cm, ovate-oblong, shortly acuminate, entire, midrib green on the upper surface and reddish-green on the lower surface. Inflorescence one per shoot, up to 45 cm long, pedunculate, peduncle c 15 cm long, greenish-white, terminal, erect, distichous, a raceme of many-flowered monochasial cymes (cincinni), cincinnal bracts bright rose-red with green tip, lip dark green distally with whitish line above. Flowers pedicellate, pedicels 1.3 cm long, off-white, glabrous, bracteate, bracts 5-12, 14-17 cm long, cincinnal bracts placed at 1.0-1.5 cm or more apart, rachis red, bracteolate, bracteoles off-white with deep brown apex, flowers inverted, 12 or more per bract, arranged in 2 rows from small to large, upper portion light green and lower portion off-white, acute at the apex. Tepals 6, in 2 cycles, 0.6-4.0 cm long. Stamens 5, filaments 0.2-2.2 cm long, anthers 2-celled, 0.8-1.0 cm long, staminode c 0.5 cm long, acuminate, shallowly tri-dentate. Carpels 3, ovary 3-celled, c 0.3 cm in diameter, off-white, ovule solitary in each cell, placentation axile, style 1, 0.9-3.5 cm long, off-white, stigma off-white. Fruit a schizocarp or drupe. Seeds 1-3 per fruit. *Flowering time:* December-June.

*Chromosome number:*  $2n = 24$  (Fedorov 1969).

*Distribution:* Northern South America (Berry and Kress 1991).

*Specimens examined:* **Dhaka:** Baldah Garden, 19.04.2007, Nahid Sultana 21 (DUH).

**Gazipur:** Rajendrapur (Omni Agro Complex), 19.12.2006, Nahid Sultana 10 (DUH).

3. **Heliconia densiflora** Hort. Par. ex Verlot, Rev. Hortic.: 274 (1869). Cogn. and Marchal, Pl. Ornem.: 2. t. 46 (1874); *Bihai densiflora* O. Kuntze, Rev. Gen.: 685 (1891). (Pl. 1, Fig. 3)

A musoid-type, perennial herb with rhizomatous underground stem, up to 1 m tall. Pseudostem green, c 2 cm in diameter. Leaves simple, petiolate, petioles c 1 cm long, lamina 15-20 × 3-5 cm, linear-lanceolate, acute, entire, midrib green. Inflorescence one per shoot, c 10 cm long, terminal on a long peduncle, erect, distichous, a raceme of many-flowered monochasial cymes (cincinni), cincinnal bracts reddish-orange. Flowers pedicellate, pedicels c 1 cm long, yellow, glabrous, bracteate, bracts 4-5, 5-10 × 1.3-1.5

cm, cincinnal bracts placed at 0.9-1.8 cm or more apart, rachis reddish-orange, bracteolate, flowers inverted, 6 or more per bract, yellow with greenish tip, acute at the apex. Tepals 6, in 2 cycles, c 3.5 cm long. Stamens 5, filaments c 1.5 cm long, anthers 2-celled, c 1 cm long, staminode c 0.6 cm long, acuminate, shallowly tri-dentate. Carpels 3, ovary 3-celled, c 0.2 cm in diameter, yellow, ovule solitary in each cell, placentation axile, style 1, 2.8 cm long, off-white, stigma yellow. Fruit a schizocarp or drupe. Seeds 1-3 per fruit. *Flowering time*: December-June.

*Distribution*: Australia, Brazil, Costa Rica and USA (Florida, Hawaii).

*Specimen examined*: **Gazipur**: Rajendrapur (Omni Agro Complex), 03.04.2007, Nahid Sultana 15 (DUH).

#### 4. *Heliconia latispatha* Benth., Bot. Voy. Sulph.: 170 (1846).

##### Key to the cultivars

Plant small, 1.0-1.5 m tall; cincinnal bracts usually red on distal half and yellow or golden proximally, basal bract usually with green leaflet, second and third bracts often with green keel and tip

***H. latispatha* cv. *Distans***

Plant large, 2-4 m tall; cincinnal bracts usually red over most of the bract with small area of yellow or golden at the base, basal bract usually with green leaflet, second and third bracts without green keel and tip

***H. latispatha* cv. *Red-Yellow Gyro***

4a. *Heliconia latispatha* Benth. cv. ***Distans*** in Bot. Voy. Sulph.: 170 (1846). *H. meridensis* Klotzsch, Linnaea 20: 462 (1847); *Bihai meridensis* O. Kuntze, Rev. Gen.: 684 (1891); *B. latispatha* (Benth.) Griggs, Bull. Torr. Bot. Club: 445 (1904).

**(Pl. 1, Fig. 4)**

*English names*: Expanded lobster claw, Golden lobster claw.

A musoid-type, perennial herb with rhizomatous underground stem, 1.0-1.5 m tall. Pseudostem green with chocolate-maroon spots, c 3 cm in diameter. Leaves simple, petiolate, petioles 15-25 cm long, lamina 60-75 × 15-20 cm, oblong, acute, entire, midrib green on the upper surface and green with red spots on the lower surface. Inflorescence one per shoot, c 30 cm long, pedunculate, peduncle c 11 cm long, glabrous or slightly hairy, terminal, erect, spiral, a raceme of many-flowered monochasial cymes (cincinni), cincinnal bracts usually red on distal half and yellow or golden proximally, basal bract usually with green leaflet, second and third bracts often with green keel and tip. Flowers pedicellate, pedicels c 1 cm long, pale yellow, glabrous, bracteate, bracts 3-7, 15-18 cm long, cincinnal bracts placed at 2-3 cm or more apart, rachis usually yellow, sometimes green, bracteolate, bracteoles brownish-yellow, flowers inverted, 12 or more per bract, yellowish-green, acute at the apex. Tepals 6, in 2 cycles, 4.0-4.3 cm long. Stamens 5, filaments 2.0-2.5 cm long, anthers 2-celled, c 0.9 cm long, staminode c 1.1 cm long, acuminate, shallowly tri-dentate. Carpels 3, ovary 3-celled, c 0.5 cm in diameter, yellow-

white, slightly hairy, ovule solitary in each cell, placentation axile, style 1, c 3.5 cm long, yellow-white, stigma brown. Fruit a schizocarp or drupe. Seeds 1-3 per fruit. *Flowering time*: April-December.

*Distribution*: Barbados, USA (Florida, Hawaii), Venezuela and West Indies.

*Specimens examined*: **Dhaka**: Mohammadpur, 09.08.2006, Nahid Sultana 3 (DUH); Kakrail, 02.04.2007, Nahid Sultana 13 (DUH).

- 4b. ***Heliconia latispatha*** Benth. cv. **Red-Yellow Gyro** in Bot. Voy. Sulph.: 170 (1846). *H. meridensis* Klotzsch, Linnaea 20: 462 (1847); *Bihai meridensis* O. Kuntze, Rev. Gen.: 684 (1891); *B. latispatha* (Benth.) Griggs, Bull. Torr. Bot. Club: 445 (1904).

(Pl. 1, Fig. 5)

*English names*: Expanded lobster claw, Golden lobster claw.

A musoid-type, perennial herb with rhizomatous underground stem, 2-4 m tall. Pseudostem green with chocolate-maroon spots, c 3.5 cm in diameter. Leaves simple, petiolate, petioles 20-25 cm long, lamina 70-80 × 20-25 cm, oblong, acute, entire, midrib green on the upper surface and green with red spots on the lower surface. Inflorescence one per shoot, c 35 cm long, pedunculate, peduncle 11-15 cm long, glabrous, terminal, erect, spiral, a raceme of many-flowered monochasial cymes (cincinni), cincinnal bracts usually red over most of the bract with small area of yellow or golden at the base, basal bract usually with green leaflet, second and third bracts without green keel and tip. Flowers pedicellate, pedicels c 1 cm long, pale yellow, glabrous, bracteate, bracts 3-7, 20-25 cm long, cincinnal bracts placed at 2-3 cm or more apart, rachis usually yellowish-green, bracteolate, bracteoles brownish-yellow, flowers inverted, 12 or more per bract, yellowish-green, acute at the apex. Tepals 6, in 2 cycles, 4.0-4.5 cm long. Stamens 5, filaments 2.3-2.5 cm long, anthers 2-celled, c 1 cm long, staminode 1.3 cm long, acuminate, shallowly tri-dentate. Carpels 3, ovary 3-celled, c 0.6 cm in diameter, yellow-white, glabrous, ovule solitary in each cell, placentation axile, style 1, 3.7 cm long, yellow-white, stigma brown. Fruit a schizocarp or drupe. Seeds 1-3 per fruit. *Flowering time*: April-December.

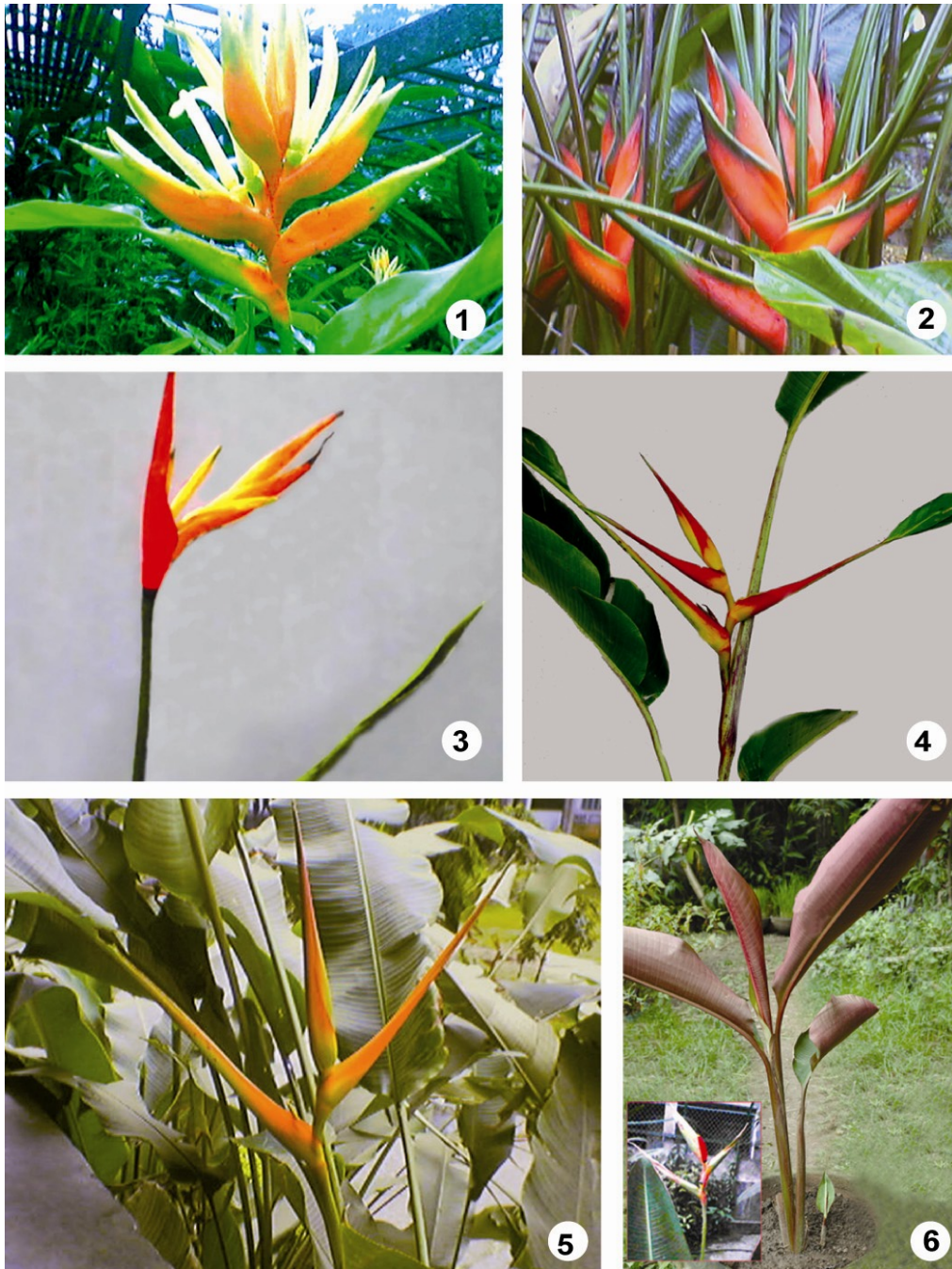
*Distribution*: Mexico to South America (Berry and Kress 1991).

*Specimen examined*: **Dhaka**: Institute of Education and Research (IER), University of Dhaka, 21.04.2007, Nahid Sultana 22 (DUH).

5. ***Heliconia metallica*** Planch. and Linden *ex* Hook., Bot. Mag.: 88. t. 5315 (1862). *Bihai metallica* O. Kuntze, Rev. Gen.: 685 (1891). (Pl. 1, Fig. 6)

*English name*: Shining bird of paradise.

A cannoid-type, perennial herb with rhizomatous underground stem, 1-3 m tall. Pseudostem purplish-maroon, c 2.5 cm in diameter. Leaves simple, sheaths purplish-



**Plate 1**

Figs 1-6. 1. *Heliconia aurantiaca* Ghiesb. ex Lem., 2. *H. bihai* (L.) L., 3. *H. densiflora* Hort. Par. ex Verlot, 4. *H. latispatha* Benth. cv. Distans, 5. *H. latispatha* Benth. cv. Red-Yellow Gyro, 6. *H. metallica* Planch. and Linden ex Hook.

maroon, petiolate, petioles 2-4 cm long, lamina 35-90 × 15-25 cm, lanceolate-ovate, acuminate, entire, upper surface green with light green midrib, lower surface purplish-maroon with purplish midrib. Inflorescence one per shoot, c 15 cm long, terminal on a long peduncle, c 45 cm long, erect, distichous, a raceme of many-flowered monochasial cymes (cincinni), cincinnal bracts greenish-red. Flowers pedicellate, pedicels 1.3 cm long, light green, glabrous, bracteate, bracts 5-7, 6-15 cm long, cincinnal bracts placed at 2 cm or more apart, rachis reddish, bracteolate, flowers inverted, 5 or more per bract, reddish-pink, acute at the apex. Tepals 6, in 2 cycles, 4.2 cm long. Stamens 5, filaments 3.7 cm long, anthers 2-celled, c 0.8 cm long, staminode c 0.5 cm long, acuminate, shallowly tri-dentate. Carpels 3, ovary 3-celled, c 0.7 cm in diameter, off-white with black edge, ovule solitary in each cell, placentation axile, style 1, 4.7 cm long, off-white, stigma off-white. Fruit a schizocarp or drupe. Seeds 1-3 per fruit. *Flowering time*: March-August.

*Chromosome number*:  $2n = 16, 18, 20, 22$  (Fedorov 1969).

*Distribution*: Honduras to Bolivia (Berry and Kress 1991).

*Specimen examined*: **Dhaka**: Baldah Garden, 16.02.2007, Nahid Sultana 11 (DUH).

## 6. *Heliconia psittacorum* L. f., Suppl.: 158 (1781).

### Key to the cultivars

Cincinnal bracts maroon, flowers parrot-green with distal dark green or black band and white tip, staminode acuminate, shallowly tri-dentate      **H. psittacorum** cv. **Black Cherry**

Cincinnal bracts orange, flowers orange with distal dark green or black band and yellow-white tip, staminode acute      **H. psittacorum** cv. **Choconiana**

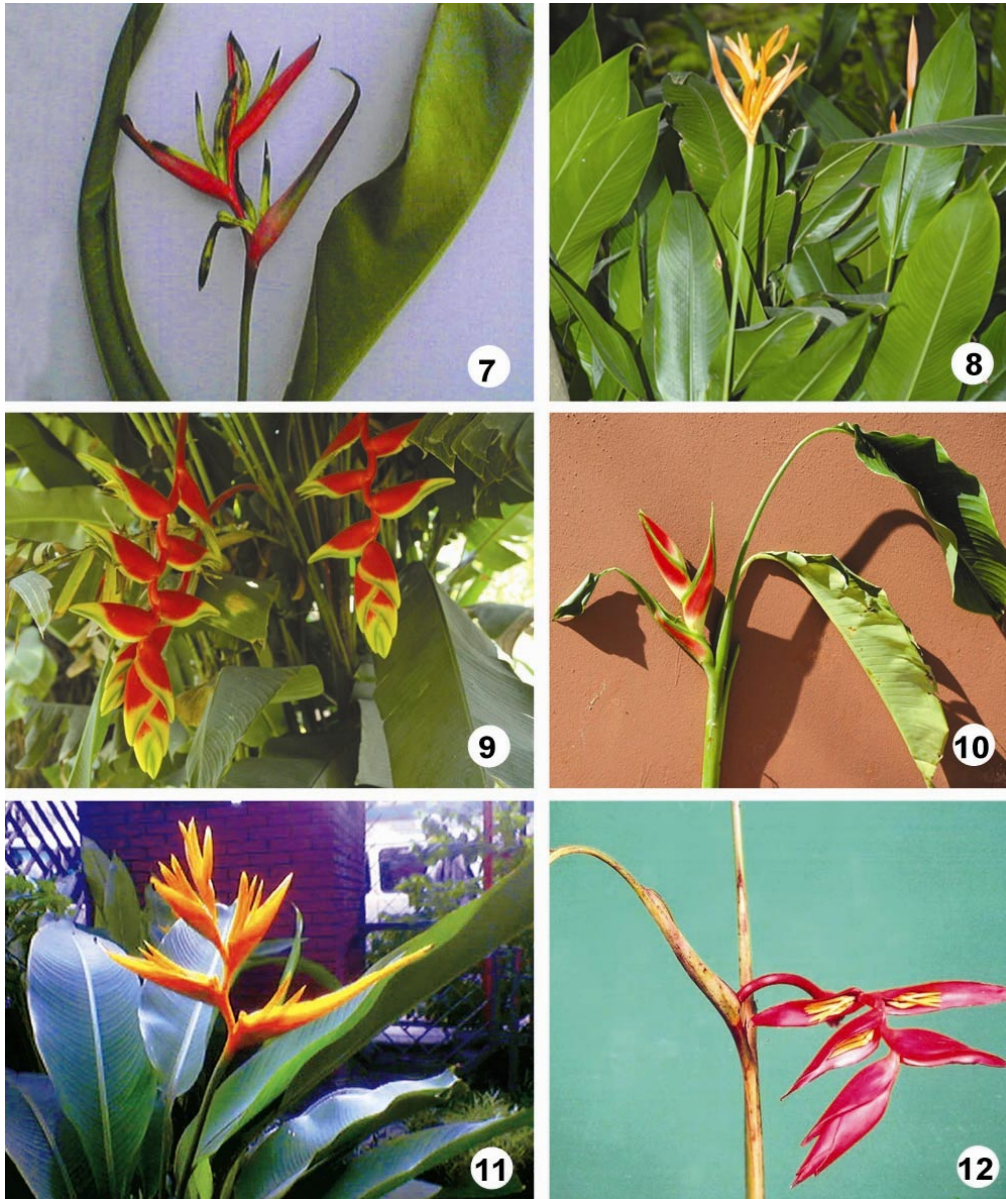
### 6a. *Heliconia psittacorum* L. f. cv. **Black Cherry** in Suppl.: 158 (1781). *Bihai psittacorum* O. Kuntze, Rev. Gen.: 684 (1891).      **(Pl. 2, Fig. 7)**

*English names*: Parakeet flower, Parrot's beak, Parrot's flower.

A musoid-type, perennial herb with rhizomatous underground stem, c 1.5 m tall. Pseudostem green, c 2.5 cm in diameter. Leaves simple, petiolate, petioles 7-10 cm long, lamina 30-45 × 7.5-11.0 cm, lanceolate, acuminate, entire, lower surface glossy, midrib green. Inflorescence one per shoot, c 14 cm long, terminal on a long peduncle, c 75 cm long, erect, distichous, a raceme of many-flowered monochasial cymes (cincinni), cincinnal bracts maroon. Flowers pedicellate, pedicels 1.7 cm long, red, glabrous, bracteate, bracts 4-6, 6-17 cm long, first bract greenish-maroon and others maroon, cincinnal bracts placed at 1.5 cm or more apart, rachis red, bracteolate, bracteoles brown, 0.9-2.0 × 0.4 cm, flowers inverted, 9 or more per bract, parrot-green with distal dark green or black band and white tip, acute at the apex. Tepals 6, in 2 cycles, 4.2 cm long. Stamens 5, filaments c 2.5 cm long, anthers 2-celled, c 1 cm long, yellow, staminode c



1.5 cm long, acuminate, shallowly tri-dentate. Carpels 3, ovary 3-celled, c 0.4 cm in diameter, off-white with green edge, ovule solitary in each cell, placentation axile, style 1, c 4 cm long, lower portion yellow, upper portion off-white, stigma yellow. Fruit a schizocarp or drupe. Seeds 1-3 per fruit. *Flowering time*: March-September.



**Plate 2**

Figs 7-12. 7. *Heliconia psittacorum* L. f. cv. Black Cherry, 8. *H. psittacorum* L. f. cv. Choconiana, 9. *H. rostrata* Ruiz and Pavon, 10. *H. stricta* Huber, 11. *H. psittacorum* L. f. × *H. spathocircinata* Aristeguieta, 12. *H. bourgaeana* Petersen × *H. collinsiana* Griggs.

*Chromosome number:*  $2n = 24$  (Fedorov 1969).

*Distribution:* USA (Hawaii).

*Specimen examined:* **Gazipur:** Rajendrapur (Omni Agro Complex), 03.04.2007, Nahid Sultana 14 (DUH).

- 6b. **Heliconia psittacorum** L. f. cv. **Choconiana** in Suppl.: 158 (1781). *Bihai psittacorum* O. Kuntze, Rev. Gen.: 684 (1891). (Pl. 2, Fig. 8)

*English names:* Parakeet flower, Parrot's beak, Parrot's flower.

A musoid-type, perennial herb with rhizomatous underground stem, c 1.5 m tall. Pseudostem greenish-maroon, c 2.5 cm in diameter. Leaves simple, petiolate, petioles c 16 cm long, lamina 20-37 × 6-9 cm, lanceolate, acute, entire, lower surface glossy, midrib green. Inflorescence one per shoot, c 10 cm long, terminal on a long peduncle, c 85 cm long, erect, distichous, a raceme of many-flowered monochasial cymes (cincinni), cincinnal bracts orange. Flowers pedicellate, pedicels 1.8 cm long, orange, glabrous, bracteate, bracts 4-6, 6-11 cm long, cincinnal bracts placed at 2.5 cm or more apart, rachis orange, bracteolate, bracteoles brown, flowers inverted, 8 or more per bract, orange with distal dark green or black band and yellow-white tip, acute at the apex. Tepals 6, in 2 cycles, c 4.5 cm long. Stamens 5, filaments c 3 cm long, anthers 2-celled, c 1 cm long, staminode 1.2 cm long, acute. Carpels 3, ovary 3-celled, c 0.5 cm in diameter, off-white with orange edge, ovule solitary in each cell, placentation axile, style 1, 4.3 cm long, orange, stigma orange. Fruit a schizocarp or drupe. Seeds 1-3 per fruit. *Flowering time:* April-December, sometimes bloom year-round.

*Chromosome number:*  $2n = 24$  (Fedorov 1969).

*Distribution:* Guianas (Berry and Kress 1991).

*Specimens examined:* **Dhaka:** Botanical Garden, University of Dhaka, 30.06.1970, A.M. Huq 76 (DACB); Mirpur Botanical Garden, 14.08.1988, Rezia Khatun 377 (DACB); Bangladesh National Herbarium (BNH) compound, Dhanmondi, 06.08.1991, Rezia Khatun 695 (DACB); Botanical Garden, University of Dhaka, 17.08.2006, Nahid Sultana 4 (DUH).

7. **Heliconia rostrata** Ruiz and Pavon, Fl. Per. 3: 71. t. 305 (1798-1802). *Bihai rostrata* (Ruiz and Pavon) Griggs, Bull. Torr. Bot. Club: 445 (1904). (Pl. 2, Fig. 9)

*English names:* False bird of paradise, Hanging heliconia, Hanging lobster claw, Lobster claw.

A musoid-type, perennial herb with rhizomatous underground stem, up to 3 m tall. Pseudostem greenish-red, c 2.5 cm in diameter. Leaves simple, petiolate, petioles up to 24 cm long, lamina 7-98 × 4-20 cm, oblong, acute, entire, midrib green, sometimes maroon beneath. Inflorescence one per shoot, 20-50 cm long, pedunculate, peduncle 15-

20 cm long, red, hairy, terminal, pendent, distichous, sometimes spiral, a raceme of many-flowered monochasial cymes (cincinni), cincinnal bracts bright red with yellow-green tip and green margin, densely hairy. Flowers pedicellate, pedicels c 0.7 cm long, yellowish-white, bracteate, bracts 4-35, 7-10 cm long, cincinnal bracts placed at 2 cm or more apart, rachis red, bracteolate, bracteoles brown, flowers inverted, 12 or more per bract, yellow, acute at the apex. Tepals 6, in 2 cycles, 3.5-5.0 cm long. Stamens 5, filaments c 2 cm long, anthers 2-celled, c 1 cm long, staminode 1.0-1.2 cm long, acute. Carpels 3, ovary 3-celled, c 0.6 cm in diameter, off-white, ovule solitary in each cell, placentation axile, style 1, c 3 cm long, off-white, stigma off-white. Fruit a schizocarp or drupe. Seeds 1-3 per fruit. *Flowering time*: March-August.

*Chromosome number*:  $2n = 24$  (Hanson *et al.* 2001).

*Distribution*: Originally from Amazonian Peru and Ecuador, now widely cultivated around the world (Berry and Kress 1991).

*Specimens examined*: **Dhaka**: Botanical Garden, University of Dhaka, 16.07.2006, Nahid Sultana 1 (DUH); Tikatuli, 04.04.2007, Nahid Sultana 16 (DUH); Dhanmondi, 05.04.2007, Nahid Sultana 18 (DUH).

8. ***Heliconia stricta*** Huber, Bol. Mus. Para. 4: 543 (1906). *Bihai stricta* Griggs, Bull. Torr. Bot. Club, 42: 325 (1915). **(Pl. 2, Fig. 10)**

*English name*: Firebird heliconia.

A musoid-type, perennial herb with rhizomatous underground stem, c 2 m tall. Pseudostem green, c 2.5 cm in diameter. Leaves simple, petiolate, petioles up to 19 cm long, lamina 25-35 × 10-12 cm, oblong, acuminate, entire, midrib green. Inflorescence one per shoot, c 25 cm long, pedunculate, peduncle c 5 cm long, green, terminal, erect, distichous, a raceme of many-flowered monochasial cymes (cincinni), cincinnal bracts red with yellowish-white base and green margin, basal bract with green keel, glabrous. Flowers pedicellate, pedicels c 1 cm long, off-white, bracteate, bracts 5-6, 10-13 cm long, cincinnal bracts placed at 1.5 cm or more apart, rachis yellowish-white, bracteolate, bracteoles off-white, flowers inverted, 12 or more per bract, arranged in 2 rows from small to large, upper portion deep green and lower portion off-white, round at the apex. Tepals 6, in 2 cycles, 1.0-3.7 cm long. Stamens 5, filaments 1.5-3.0 cm long, anthers 2-celled, c 0.7 cm long, staminode c 1.5 cm long, acute. Carpels 3, ovary 3-celled, c 0.4 cm in diameter, off-white, ovule solitary in each cell, placentation axile, style 1, 1.7-4.0 cm long, off-white, stigma brown. Fruit a schizocarp or drupe. Seeds 1-3 per fruit. *Flowering time*: December-June.

*Distribution*: Bolivia, Ecuador, Surinam and Venezuela (Brickell 1996).

*Specimen examined*: **Gazipur**: Rajendrapur (Omni Agro Complex), 19.12.2006, Nahid Sultana 9 (DUH).

9. **Heliconia psittacorum** L. f. × **H. spathocircinata** Aristeguieta (Pl. 2, Fig. 11)

*English name:* Golden torch.

A musoid-type, perennial herb with rhizomatous underground stem, c 50 cm tall. Pseudostem green, c 2 cm in diameter. Leaves simple, sheaths green, petiolate, petioles 4.5-6.0 cm long, lamina 17-30 × 7.5-9.5 cm, oblong-obovate, acuminate, entire, midrib green. Inflorescence one per shoot, c 15 cm long, terminal on a long peduncle, 85 cm long, erect, distichous to spiral, a raceme of many-flowered monochasial cymes (cincinni), cincinnal bracts yellow. Flowers pedicellate, pedicels c 1.3 cm long, yellow, glabrous, bracteate, bracts 5-8, 4.5-12.0 cm long, cincinnal bracts placed at 1.0-3.5 cm or more apart, rachis yellow, bracteolate, bracteoles c 3.5 × 0.7 cm, light yellow, flowers inverted, 7 or more per bract, yellow, acute at the apex. Tepals 6, in 2 cycles, 4.7-5.0 cm long. Stamens 5, filaments c 2.7 cm long, anthers 2-celled, c 1 cm long, staminode c 1.6 cm long, acuminate, shallowly tri-dentate. Carpels 3, ovary 3-celled, c 0.4 cm in diameter, off-white with yellow edge, ovule solitary in each cell, placentation axile, style 1, c 4.5 cm long, yellow, stigma off-white. Fruit a schizocarp or drupe. Seeds 1-3 per fruit. *Flowering time:* December-April.

*Distribution:* Guyana and South America.

*Specimens examined:* **Dhaka:** Kakrail, 23.08.2006, Nahid Sultana 5 (DUH); Basundhara, 04.04.2007, Nahid Sultana 17 (DUH). **Gazipur:** Rajendrapur (Omni Agro Complex), 19.12.2006, Nahid Sultana 8 (DUH).

10. **Heliconia bourgaeana** Petersen × **H. collinsiana** Griggs (Pl. 2, Fig. 12)

*English name:* Pedro Ortiz.

A musoid-type, perennial herb with rhizomatous underground stem, c 155 cm tall. Pseudostem green with maroon spots, c 3.5 cm in diameter. Leaves simple, sheaths green, petiolate, petioles c 15 cm long, lamina 30-35 × 10-15 cm, oblong, acuminate, entire. Inflorescence one per shoot, c 40 cm long, terminal, contorted, a raceme of many-flowered monochasial cymes (cincinni), cincinnal bracts maroon. Flowers pedicellate, pedicels 2.2 cm long, yellow, glabrous, bracteate, bracts 5-8, 15-25 cm long, cincinnal bracts placed at 2-5 cm or more apart, rachis maroon, bracteolate, light yellow, flowers inverted, 13 or more per bract, yellow, acute at the apex. Tepals 6, in 2 cycles, c 5.2 cm long. Stamens 5, filaments 3.2 cm long, anthers 2-celled, 1.2 cm long, staminode 1.7 cm long, acuminate, shallowly tri-dentate. Carpels 3, ovary 3-celled, c 0.6 cm in diameter, off-white with yellow edge, ovule solitary in each cell, placentation axile, style 1, c 5 cm long, orange, stigma off-white. Fruit a schizocarp or drupe. Seeds 1-3 per fruit. *Flowering time:* December-June.

*Distribution:* Mexico and Costa Rica.

*Specimen examined:* **Gazipur:** Rajendrapur (Omni Agro Complex), 06.04.2007, Nahid Sultana 19 (DUH).

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