

TAXONOMIC REVISION OF THE GENUS *CRINUM* L. (LILIACEAE) OF BANGLADESH

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Abstract

The genus *Crinum* L. represented by eight species in Bangladesh is revised. The species occurring in Bangladesh are *Crinum amabile* Donn, *C. amoenum* Roxb., *C. asiaticum* L., *C. defixum* Ker-Gawl., *C. jagus* (Thomps.) Dandy, *C. latifolium* L., *C. pratense* Herb. and *C. stenophyllum* Baker. Each species is described with updated nomenclature, important synonyms, English and Bangla names, phenology, specimens examined, chromosome number, habitat, distribution, economic value and mode of propagation. A dichotomous bracketed key to the species and illustrations are also provided.

Introduction

The classification of the lilioid monocots has long been problematic (Chase *et al.*, 2009). Some authors treated all lilioid monocots including the genus *Crinum* L. in one family, Liliaceae *s.l.* (Cronquist, 1981). Though the genus *Crinum* L. was formerly included in the family Liliaceae, the Angiosperm Phylogeny Group (APG) reevaluated the taxonomic position of this genus and placed it in the family Amaryllidaceae (APG III, 2009). Linnaeus established the genus *Crinum* in 1737 recognising four species, *viz.* *Crinum latifolium*, *C. asiaticum*, *C. americanum* and *C. africanum* (Nordal, 1977). The pantropical genus *Crinum* L. consists of about 112 species distributed in tropical Africa, America, Asia and Australia (Govaerts *et al.*, 2012). The genus is most diverse in Africa, particularly sub-Saharan Africa. Biogeographical analyses place the origin of *Crinum* in southern Africa (Meerow *et al.*, 2003; Kwembeya *et al.*, 2007).

Crinum are perennial herbs with globose to ovoid subterranean bulbs. Herbert (1837) divided the genus into two sections on the basis of the degree to which the tepals are patent. Baker (1881) provided detailed insight into the genus *Crinum* and divided the genus into three subgenera based on floral characters, *viz.*, *Stenaster*, *Platyaster* and *Codonocrinum*. The actinomorphic flowers with linear petals were placed in the subgenus *Stenaster*; actinomorphic flowers and lanceolate petals were included in the subgenus *Platyaster*, while the subgenus *Codonocrinum* is characterized by funnel-form, zygomorphic flowers and curved tubes. Later, Baker (1898) submerged *Platyaster* into subgenus *Stenaster*, which must be named subgenus *Crinum* as it contains the type species, *C. americanum* L. (Meerow *et al.*, 2003). In order to resolve the mix-ups in nomenclature in *Crinum* several systematic studies have been carried out (Herbert, 1820; Baker, 1888, 1896; Hooker, 1892; Uphof, 1942; Verdoorn, 1973; Dassanayake, 2000). Though identification of *Crinum* species is straight forward, yet there is species complexity in many cases. In the recent past, many species of *Crinum* were placed under some other genera especially under *Amaryllis*, while many species belonging to other genera were transferred to *Crinum* (Hannibal and Williams, 1998). These snags were mainly due to inadequate research and misinterpretation or misidentifications of the plant specimens (Hannibal and Williams, 1998). Recently, Yakandawala and Samarakoon (2006) made an attempt to solve the taxonomic ambiguity on species limits of *C. latifolium* and *C. zeylanicum*.

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Members of *Crinum* are important for their ornamental, economical and medicinal values. Leaf extract is used for treatment for vomiting and for ear-aches. The bulbs are crushed and applied onto piles and abscesses to cause suppuration. In addition, the roasted bulbs are used as a rubefacient in rheumatism (Jayaweera, 1981). *C. asiaticum* possesses antimicrobial activities (Win, 2011). Phytochemical analysis has recently yielded a vast array of compounds, including more than 150 different alkaloids in the genus *Crinum* (Fennell and van Staden, 2001).

In Bangladesh, *Crinum* L. appears to be the largest genus in the family Liliaceae represented by eight species including both wild and cultivated. In the Indian sub-continent Hooker (1892) was the pioneer on the genus *Crinum* L. who recognised 19 species from this area of which 7 species were treated as doubtful or imperfectly known. Of these, four species were reported from the area of current Bangladesh. Later, Prain (1903) listed four *Crinum* species from the area of present Bangladesh. A very few cytological investigations on some *Crinum* species occurring in Bangladesh were made over last two decades. Alam *et al.* (1998) made a karyotype analysis in *C. pretense* and *C. defixum* with differential banding patterns. Later, Ahmed *et al.* (2004) studied fluorescent banding in *C. latifolium* L., *C. asiaticum* L. and *C. amoenum* Roxb. Those studied were concentrated with orcein, CMA and DAPI rather than taxonomy of those species. Recently, Hassan (2007), and Afroz and Hassan (2008) documented six *Crinum* species occurring in Bangladesh with inadequate taxonomic description. There has been no detailed taxonomic studies on this genus in Bangladesh. Therefore, the present study aims to revise the genus *Crinum* L. in Bangladesh.

Materials and Methods

Plant samples of different *Crinum* L. species were collected from different parts of the country and planted in the Dhaka University Botanical Garden for further study. The collected plant specimens were critically studied and examined which were supplemented by the herbarium specimens housed at the Dhaka University Salarkhan Herbarium (DUSH) and Bangladesh National Herbarium (DACB). Identification of the *Crinum* species were confirmed in consultation with standard literature (Hooker, 1892; Karthikeyan *et al.*, 1989; Raven and Zhengyi, 2000; Utech, 2002; Hassan, 2007) and matching with authentically identified herbarium specimens deposited in DUSH and DACB. Updated nomenclature is determined consulting The Plant List (2013), a working list of all plant species. Each species is described with updated nomenclature, important synonyms, English and Bangla names, flowering and fruiting period, specimens examined, chromosome number, habitat, distribution, economic value, and mode of propagation. A dichotomous bracketed key to the species and illustrations are also provided. The voucher specimens are deposited at DUSH.

Results

Taxonomic treatment

Genus *Crinum* L.,

Gen. Pl. ed. 1: 97 (1737); Sp. Pl.: 291 (1753); Benth. & Hook. f., Gen. Pl. 3: 726 (1883); Bak., Handb. Amaryll. : 74 (1888); Fl. Cap. 6: 198 (1896); Fl. Trop. Afr. 7: 373 (1898); Phill., Gen. ed. 2: 203 (1951); Uphof in Herbertia 9: 63 (1942); Traub, the Genera of Amaryllidaceae : 60 (1963). *Crinopsis* Herb., Amaryll. : 270 (1837). *Erigona* Salisb., Gen. Pl. Fragm. : 115 (1866). *Liriamus* Rafin., Fl. Tell. 4: 23 (1836). *Scadianus* Rafin., Atl. Journ. : 164 (1833). *Taenais* Salisb., Gen. Pl. Fragm. : 115 (1856). *Tanghekolli* Adans. Fam. 2: 57 (1763).

Perennial herbs with tunicated bulbs, usually produced at the apex into a short or long false stem. Leaves long, lorate or ensiform, spirally arranged, sessile, with smooth or scabrous edges.

Peduncle compressed, solid. Flowers large, fragrant, umbellate, short-pedicelled or sessile, spathes 2, lanceolate, scarious; bracteoles many, linear. Perianth funnel-shaped or almost salver-shaped, tube long, straight or incurved, perianth segments 6, linear-lanceolate or narrowly oblong, red to white, often striped, streaked, or overlaid with red abaxially. Stamens 6, adnate to the throat of the perianth tube; filaments free, filiform, declinate or diverging; anthers linear or oblong-linear, dorsifixed. Carpels 3, syncarpous. Ovary inferior, 3-celled, ovules few in each locule, biseriate; style long, filiform, more or less declinate; stigma small, sub-capitate. Fruit a capsule, sub-globose or obovoid, membranous or coriaceous, bursting irregularly. Seeds few, large, green, rounded or irregularly compressed.

Key to the species of *Crinum* L. occurring in Bangladesh

- | | | |
|----|--|------------------------|
| 1. | Perianth lobes linear | 2 |
| - | Perianth lobes oblong or lanceolate | 5 |
| 2. | Umbels more than 15-flowered | 3 |
| - | Umbels up to 15-flowered | 4 |
| 3. | Scape purplish, shorter than the leaves | <i>C. amabile</i> |
| - | Scape green, longer than the leaves | <i>C. asiaticum</i> |
| 4. | Bulbs with a fusiform, stoloniferous base | <i>C. defixum</i> |
| - | Bulbs not stoloniferous | <i>C. stenophyllum</i> |
| 5. | Perianth tube erect; stamens spreading | 6 |
| - | Perianth tube upcurved; stamens declinate | 7 |
| 6. | Leaves acuminate, scabrous; perianth lobes shorter than the tube | <i>C. amoenum</i> |
| - | Leaves obtuse or sub-acute; perianth lobes longer than the tube | <i>C. pratense</i> |
| 7. | Leaf margin scabrous; perianth vertically reddish on the back | <i>C. latifolium</i> |
| - | Leaf margin smooth; perianth white | <i>C. jagus</i> |

Crinum amabile Donn, Hort. Cantabrig. ed. 6: 82 (1811). *Crinum augustum* Roxb., Fl. Ind. 2: 136 (1832). (Figs 1 & 7A-C).

English names: Purple Spider Lily, Pink Crinum lily, Giant Spider Lily, Tiger Lily.

Bangla name: *Sukhdarshan*.

A perennial herb with a large tunicated bulb, bulb c. 40 × 12 cm with long stem; roots c. 15 cm long. Leaves long, c. 60-170 × 7-20 cm, lorate, entire, acute, glabrous, green in colour. Scape solid, 60-130 cm long, purplish, 20-50 flowered umbel, green, glabrous, arise from the side of the stem. Flowers large, actinomorphic, bisexual, epigynous, purple, fragrant at night, pedicellate, pedicel c. 3.7 cm long. Spathes 2, 15-25 × 7.0-12.5 cm, lanceolate, purplish-green or purple, bracteoles many, linear, c. 10.2 × 0.5 cm, white in colour. Perianth segments 6, c. 17 × 3 cm, purple, lower parts forming a long, slightly curved tube, tube c. 13 cm long, purple. Stamens 6, adnate to the throat of the perianth tube; filaments filiform, c. 9 cm long, purplish; anthers linear, 1.5-2.5 cm long, dorsifixed, yellow. Carpels 3, syncarpous; ovary inferior, c. 1.8 cm long, 3-celled, purple; style single, filiform, c. 22 cm long; stigma sub-capitate; placentation axile. Fruit not formed.

Flowering: Almost throughout the year.

Specimens examined: **Dhaka**: Dhaka University Botanical Garden, 15.11.2006, Sumona 3 (DUSH); Cantonment, Shaheed Anwar Girls College campus, 15.11.2006, 06.10.2016, Sumona 105 (DUSH).

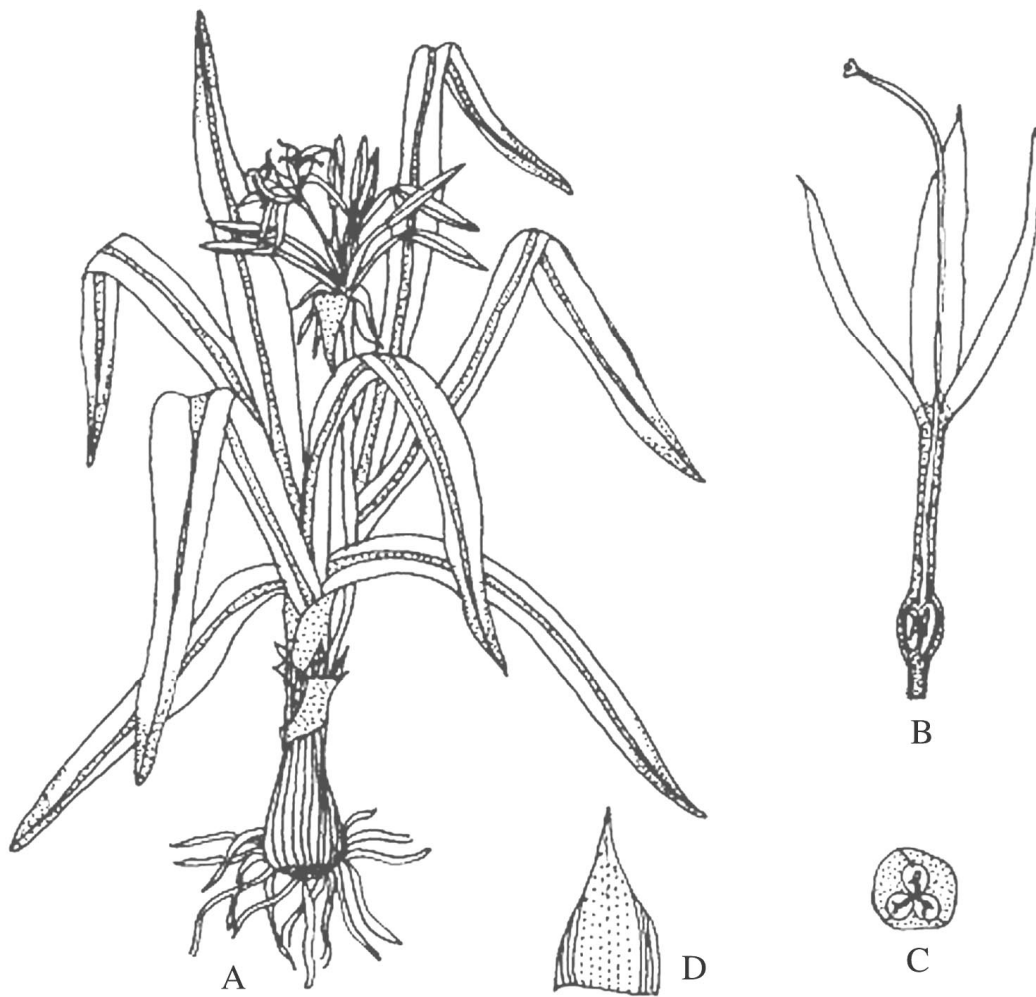


Fig. 1. *Crinum amabile* Donn: A. Habit ($\times 0.1$); B. L.S. of a flower ($\times 0.2$); C. T.S. of ovary ($\times 2$); D. Bract ($\times 0.1$).

Chromosome number: $2n = 33$ (Ahmed *et al.*, 2004).

Habitat: Cultivated in gardens.

Distribution: South Africa, Tropical regions of Asia. In Bangladesh, the species is cultivated in some private institutions and roadsides.

Economic value: Ornamental.

Propagation: By bulb separation.

Crinum amoenum Roxb., Hort. Beng. : 23 (1814); Roxb., Fl. Ind. 2: 127 (1832); Hook. f., Fl. Brit. Ind. 6: 282 (1892); Prain, Beng. Pl. 2: 798 (1903); Hassan, Encycl. Flora & Fauna of Bangladesh 11: 340 (2007). *Crinum himalense* Royle, Ill. Bot. Himal. Mts. (1839); *Crinum verecundum* Carey ex M. Roem., Fam. Nat. Syn. Monogr. : 75 (1847). (Figs 2 & 7D-F).

English names: Himalayan Crinum, Tiger Lily.

Bangla name: *Gang Kachu*.

A bulbous perennial herb, bulb globose, 5.0-7.5 cm in diameter. Leaves 45-60×2.5-4.0 cm, bright-green, sub-erect, ensiform, tapering from the base to the tip, acuminate, margin sub-scabrous. Scape 30-60 cm long, rather slender, sub-cylindric, greenish-purple. Inflorescence of 6-12 flowered umbels; spathes 2, c. 5 cm long, lanceolate; bracteoles many. Flowers sub-sessile. Perianth tube green, 7.5-10.0 cm long, lobes 5.0-7.5 cm long, linear-lanceolate, longer than the filaments, white. Stamens 6; filaments red, c. 6 cm long, shorter than the perianth lobes; anthers oblong, dorsifixed. Carpels 3; ovary 3-celled, inferior, c. 1.6 cm long; placentation axile. Fruit a capsule. Seeds 1-5, irregularly round.

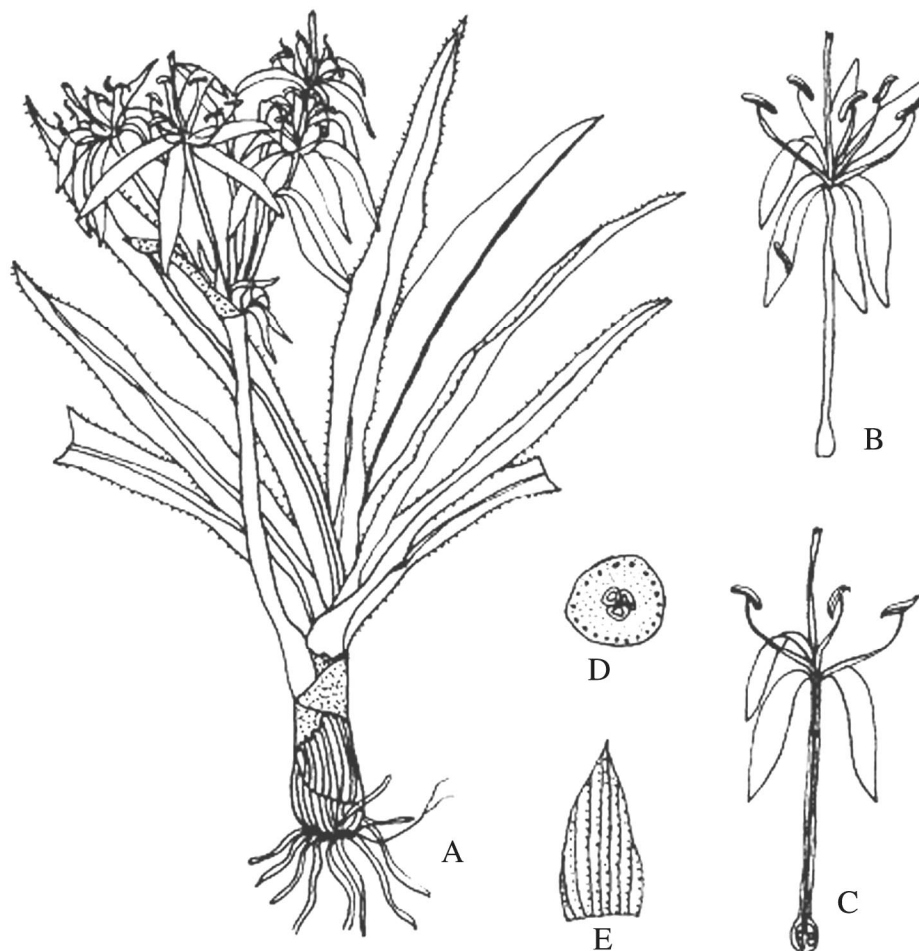


Fig. 2. *Crinum amoenum* Roxb.: A. Habit (×0.2); B. Flower (×0.3); C. L.S. of a flower (×0.3); D. T.S. of ovary (×3); E. Bract (×0.5).

Flowering and fruiting: May–August.

Specimens examined: **Dhaka:** Baldha Garden, 26.05.2007, Sumona 38 (DUSH); Dokkhin Middle Faidabad, 24.05.2007, Sumona 36 (DUSH). **Patuakhali:** Galachipa, Rangabali, 23.03.2006, M. Sultana 1208 (DUSH); Patuakhali Sadar, Laukathi, 15.05.2006, M. Sultana 1268 (DUSH). **Chittagong:** Chunati, Goalmara, 28.06.1997, Rahman *et al.* 663B (HCU). **Cox's Bazar:** Teknaf, Upazila Sadar, 25.05.2014, Sumona 88 (DUSH).

Chromosome number: $2n = 18, 22$ (Kumar and Subramaniam, 1986).

Habitat: In forests, plain lands and gardens.

Distribution: Tropical Himalayas, India (Sikkim and Khasia Hills), Nepal and Myanmar. In Bangladesh, it is distributed in Dhaka, Patuakhali, Sylhet, Cox's Bazar and Chittagong districts.

Economic value: Ornamental.

Propagation: By seeds and sucker formation.

Crinum asiaticum L., Sp. Pl.: 292 (1753); Hook. f., Fl. Brit. Ind. 6: 280 (1892); Prain, Beng. Pl. 2: 797 (1903); Utech, Fl. North Am. 26: 279 (2002); Hassan, Encycl. Flora & Fauna of Bangladesh 11: 340 (2007). *Amaryllis carnososa* Herb. Ham. *ex* Hook. f., Fl. Brit. Ind. 6: 280 (1892). *Crinum albiflorum* Noronha, Verh. Batav. Genootsch. Kunst. 5(Art. 4): 12 (1790). *Crinum angustifolium* Herb. *ex* Steud., Nomencl. Bot. ed. 2, 1: 438 (1840). *Crinum bancanum* Kurz, Tijdschr. Nederl. Ind. 27: 231 (1864). *Crinum bracteatum* Willd., Sp. Pl., ed. 4. 2(1): 47 (1799). *Crinum hornemannianum* M. Roem., Fam. Nat. Syn. Monogr. : 71 (1847). *Crinum macrocarpum* Carey *ex* Kunth, Enum. Pl. 5: 553 (1850). *Crinum plicatum* Livings. *ex* Hook., Bot. Mag. 56: t. 2908 (1829). *Crinum rumphii* Merr., Interpr. Rumph. Herb. Amboin. : 141 (1917). *Crinum sumatranum* Roxb., Fl. Ind. 2: 131 (1832). *Crinum umbellatum* Carey *ex* Herb., Bot. Mag. 47: sub t. 2121, p. 7 (1820). *Crinum woolliamsii* L.S. Hannibal, Herbert. 43(1): 14 (1987). *Crinum toxicarium* Roxb., Fl. Ind. 2: 134 (1832). **(Figs 3 & 7G-I).**

English names: Poison Bulb, Giant Crinum Lily, Crinum Lily.

Bangla names: *Bara Kanur, Nagdal, Kachori, Sukhdarshan, Gaerhonar-pata.*

A perennial herb with a large tunicated bulb. Leaves long, 36-48×3-5 cm, lorate, margin entire, acute, wavy, glabrous, green in colour. Scape solid, 15-50 flowered umbels, green, glabrous. Flowers large, actinomorphic, bisexual, epigynous, white, fragrant at night, pedicellate; pedicel c. 3.3 cm long. Bracts 2, c. 6.5×3.2 cm, ovate-lanceolate, acute, greenish-white, bracteoles many, linear, white in colour. Perianth segments 6, c. 8×1 cm, white, lower parts forming a long, straight tube, tube erect, greenish, c. 7.5 cm long, equalling the linear lobes, lobes revolute. Stamens 6, adnate to the throat of the perianth tube; filaments filiform, c. 4.6 cm long, purplish in upper half and white in lower half; anthers linear, 1.5-2.5 cm long, dorsifixed, yellow. Carpels 3, syncarpous, green; ovary inferior, c. 1.5 cm long, 3-celled, placentation axile; style single, filiform; stigma sub-capitate. Fruit a capsule, c. 3.0×1.5 cm, sub-globose, beaked, green, bursting irregularly. Seeds round, concave.

Flowering and fruiting: March–November.

Specimens examined: **Dhaka:** Dhaka University Botanical Garden, 08.08.2007, Sumona 43 (DUSH); *ibid.*, 01.07.1968, Mozahar 155; 05.09.1994, M.M. Khan 89; Uttara, Sector No. 8, 12.07.2007, Sumona 41 (DUSH). **Jhalakathi:** Chankati, 03.03.1987, Huq & Mia 6667 (DACB). **Khulna:** Sundarban, Manderbaria, 21.08.2002, S. Nasir Uddin N-1386(1); Sundarban, Kotka, 24.08.2010, Sumona 65; Kotka, 21.09.2011 Sumona 71 (DACB). **Mymensingh:** Bhaluka, 03.07.2001, M.S. Hossain 229; Ishwarganj, 05.07.2001, M.S. Hossain 261 (DACB). **Patuakhali:** Kalapara, Nilganj, 11.03.1999, M. Sultana 320 (DUSH); Patuakhali Sadar, Lohalia, 14.05.2005,

M. Sultana 714 (DUSH); Kalapara, Gongamoti, 07.01.2006, M. Sultana 935 (DUSH); Kalapara, 08.08.2013, Sumona 81 (DUSH).

Chromosome number: $2n = 22$ (Kumar and Subramaniam, 1986).

Habitat: Homesteads, coastal areas, and also cultivated in gardens.

Distribution: Throughout the tropical parts of India, Sri Lanka and Nepal. In Bangladesh, it is common in the Sundarbans and coastal areas of Chittagong, and also planted in gardens.

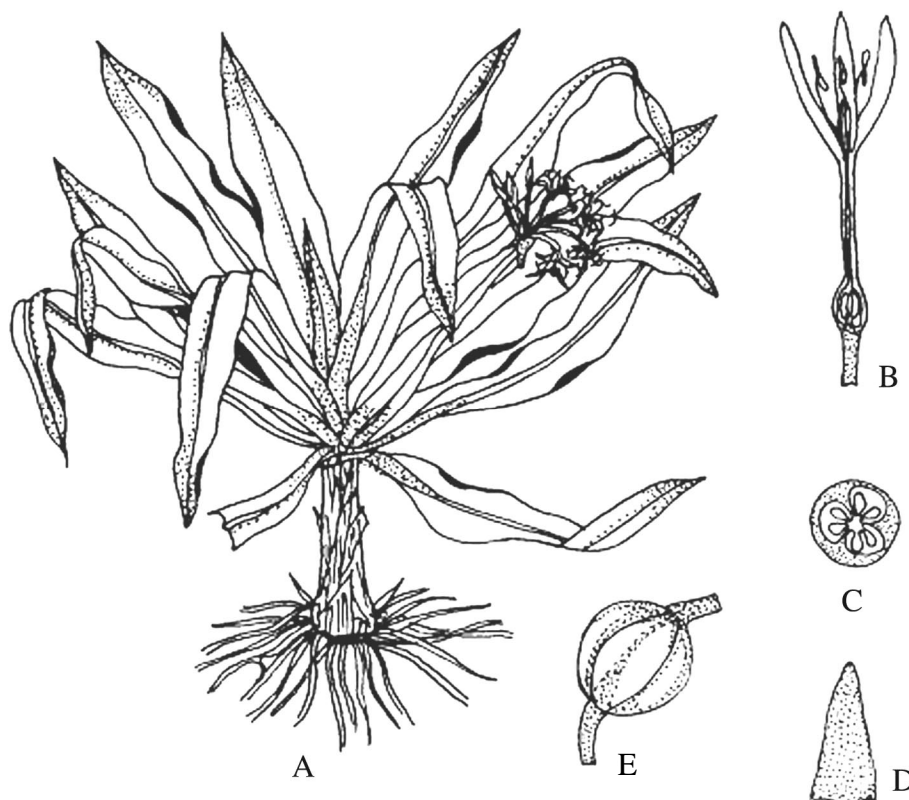


Fig. 3. *Crinum asiaticum* L.: A. Habit ($\times 0.1$); B. L.S of a flower ($\times 0.4$); C. T.S. of ovary ($\times 5$); D. Bract ($\times 0.3$); E. Fruit ($\times 1$).

Economic value: Widely planted in the gardens for its beautiful flowers. The bulb contains the alkaloids lycorine, crinidine and hamayne (Ghani, 2003). The bitter bulb is tonic, laxative, expectorant, used in biliousness and strangury and other urinary complaints. Fresh root is emetic, nauseant and diaphoretic. Seeds are purgative, diuretic, emmenagogue and tonic. Leaves are expectorant, applied to skin diseases and to reduce inflammation (Sinha, 1996). Tuber is useful in bronchitis and diseases of the chest and lungs, gonorrhoea, night blindness and defective vision, disease of the spleen, urinary concretion, lumbago, anuria, toothache and snake-bite (Kirtikar *et al.*, 1935).

Ethnobotanical information: Leaf juice is used in ear-ache (Yadav and Bhandoria, 2013).

Propagation: By bulbs and seeds.

Crinum defixum Ker-Gawl., Quart. Journ. Sci. 3: 105 (1817). Hook. f., Fl. Brit. Ind. 6: 281 (1892); Prain, Beng. Pl. 2: 798 (1903); Cooke, Fl. Pres. Bomb. 2: 749 (1908); Haines, Bot. Bih. Or.: 1108 (1924); Hassan, Encycl. Flora & Fauna of Bangladesh 11: 341 (2007). *Crinum asiaticum* Roxb., Hort. Beng. : 23 (1814). *Crinum viviparum* (Lamk.) R. Ansari & V.J. Nair, J. Econ. Taxon. Bot. 11(1): 205 (1988). (Figs 4 & 7J).

English names: Poison Bulb, Crinum Lily.

Bangla name: *Sukhdarshan*.

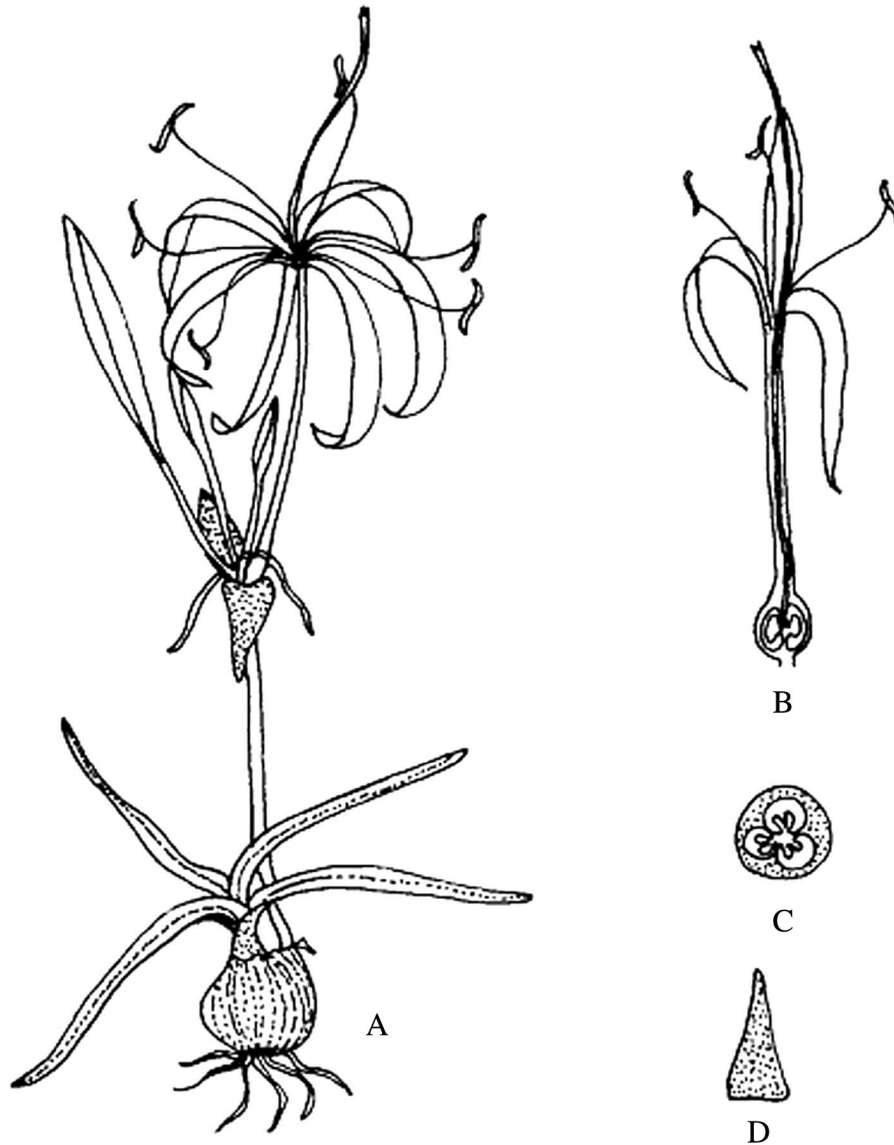


Fig. 4. *Crinum defixum* Ker-Gawl.: A. Habit ($\times 0.2$); B. L.S. of a flower ($\times 0.4$); C. T.S of ovary ($\times 0.3$); D. Bract ($\times 0.2$).

Very stout bulbous herb, bulb with a fusiform stoloniferous base, neck cylindrical. Leaves 30-80×2-3 cm, linear or linear-lanceolate, concave, smooth, entire, obtuse. Scape 35-50 cm long, usually shorter than the leaves, compressed, smooth; spathe 2-leaved, bracteoles filiform. Flowers in umbels, umbel usually 6-15 flowered, bisexual, large, shortly pedicellate. Perianth white, tube cylindrical, 6.0-7.5 cm long, segments 6, linear, nearly as long as the tube. Stamens 6, adnate to the throat of the perianth tube, spreading, recurved; filaments white or pink, shorter than the perianth lobes; anthers oblong, brown, versatile. Carpels 3, syncarpous; ovary inferior, 3-celled; style erect, exerted; stigma simple. Fruit a capsule, ellipsoid, c 2.5 cm long, 1-2 seeded. Seeds large, rugose.

Flowering and fruiting: May–August.

Specimens examined: **Dhaka:** Dhaka University Botanical Garden (originally collected from Char Kukri Mukri), 05.07.2017, Sumona 110 (DUSH); Savar: Jahangirnagar University campus, 30.04.2015, Sumona 94 (DUSH). **Patuakhali:** Bhupal, Kalaiya, 13.03.1973, M. S. Khan K-2843 (DACB); Patuakhali Sadar, Lohalia, 18.11.2004, M. Sultana 462 (DUSH); Mirzaganj, Subidkhali, 20.11.2004, M. Sultana 565 (DUSH); Galachipa, Basunia, 01.03.2005, M. Sultana 619 (DUSH); Galachipa, Panpotti, 18.12.2010, M. Sultana 1860 (DUSH).

Chromosome number: $2n = 22$ (Alam *et al.*, 1998); 50, 60 (Kumar and Subramaniam, 1986).

Habitat: Swampy river banks and gardens where it is commonly cultivated.

Distribution: Throughout tropical India and Sri Lanka. In Bangladesh, it is well represented in forests and many gardens.

Economic value: Commonly cultivated in the gardens for its beautiful large fragrant flowers. Bulb is nauseous, emollient, emetic and diaphoretic. The plant is toxic to cattle (Sinha, 1996). Bulb and stolon are administered in the treatment of burns and carbuncle. In otitis a few drops of juice of leaves are instilled into the ear. In Rema Kalenga area of Moulvi Bazar district bulbs are used for the treatment of stomach complaints of cow (Yusuf *et al.*, 2009).

Propagation: By bulbs.

Crinum jagus (Thomps.) Dandy, Journ. Bot. Lond. 77: 64 (1939). *Amaryllis jagus* Thomps., Bot. Displ. : t. 6 (1798); *Crinum giganteum* Andr., Bot. Rep. : t. 169 (1810). (Figs 5 & 7K).

English name: Giant Crinum.

Bangla name: *Sukhdarshan*.

A bulbous perennial herb, bulb globose, 12.5-15.0 cm in diameter with c. 7 cm long neck. Leaves many, 60-90×7-12 cm, lorate or lanceolate, margin entire, wavy, acute or obtuse. Scape 30-90 cm long, green; spathes 2, greenish-white, ovate-lanceolate, c. 9.7×5.9 cm, obtuse; bracteoles 4-8, linear-lanceolate, c. 8.0×0.7 cm, greenish-white. Inflorescence of 4-8 flowered umbels, short-pedicelled or sessile. Perianth segments 6, c. 11.5×4.0 cm, ovate-lanceolate, fragrant, white, lobes as long as or shorter than the tube, tube c. 19 cm long, green. Stamens 6; filaments adnate to the throat of the perianth tube, 6-8 cm long, shorter than the perianth lobes, curved, white; anthers oblong, c. 1.5×0.2 cm, dorsifixed, versatile, spiral after bursting. Carpels 3, syncarpous; ovary 3-celled, inferior, c. 2.5×1.5 cm; placentation axile; style with stigma c. 9.5 cm long, green. Fruit a sub-globose capsule. Seeds not found.

Flowering and fruiting: April–July.

Specimens examined: **Dhaka:** Dhaka University campus, Science Library, 03.05.2007, Sumona 25 (DUSH); Near Charukala Institute, 26.05.2007, Sumona 39 (DUSH); Dhaka University Botanical Garden (originally collected from Char Kukri Mukri), 10.05.2017, Sumona 106 (DUSH).

Chromosome number: $2n = 33$ (Kumar and Subramaniam, 1986).

Habitat: Soil rich in organic matter.

Distribution: Native to tropical Africa. Found in Sri Lanka, India, Myanmar, and Malaysia. In Bangladesh, it is found to be grown in different gardens.

Economic value: Cultivated in the gardens for its large beautiful flowers.

Ethnobotanical information: Crushed and roasted bulbs are used in rheumatism. Leaf juice is used in ear-ache (Sinha, 1996).

Propagation: By bulbs.

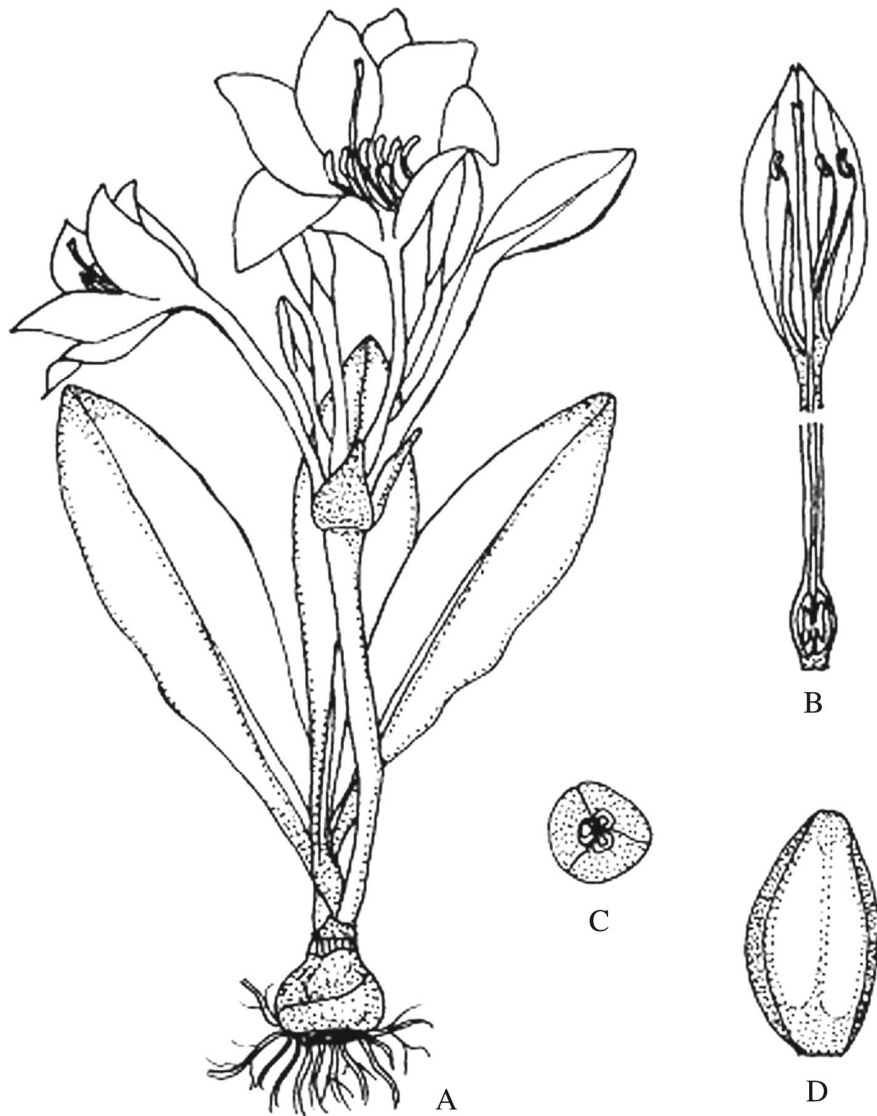


Fig. 5. *Crinum jagus* (Thomps.) Dandy: A. Habit ($\times 0.1$); B. L.S. of a flower ($\times 0.1$); C. T.S. of ovary ($\times 2$); D. Bract ($\times 0.1$).

***Crinum latifolium* L.**, Sp. Pl.: 291 (1753); Hook. f., Fl. Brit. Ind. 6: 283 (1892); Prain, Beng. Pl. 2: 798 (1903); Raven and Zhengyi, Fl. China 24: 265 (2000); Hassan, Encycl. Flora & Fauna of Bangladesh 11: 341 (2007). *Crinum ornatum* Herb., Amaryll. : 262 (1837). *Crinum moluccanum* Roxb., Fl. Ind. 2: 140 (1859). *Crinum zeylanicum* L., Syst. ed. 12 (1767). (Figs 6 & 7L).

English name: Pink Striped Trumpet Lily.

Bangla name: *Sukhdarshan*.

A bulbous perennial herb, bulb globose, 12.5-15.0 cm in diameter with a short neck. Leaves many, 60-90×7-12 cm, lorate, margin sub-scabrid. Scape 60-90 cm long, greenish-purple or yellowish-green; spathes 2, reddish-green or purple, lanceolate. Inflorescence of 6-12 flowered umbels, short-pedicelled. Perianth segments 6, c. 12.2×3.0 cm, perianth tube curved, c. 7 cm long, lobes 7-15 cm long, as long as or shorter than the tube, elliptic-oblong or elliptic-lanceolate, fragrant, white, more or less streaked or tinged with red towards the centre, sometimes red-purple, nearly all over the back. Stamens 6, declinate; filaments adnate to the throat of the perianth tube, 6-8 cm long, shorter than the perianth lobes; anthers oblong, 1.3-2.0 cm long, grey, dorsifixed, versatile. Carpels 3, syncarpous; ovary inferior, 3-celled, c. 1 cm long; placentation axile. Fruit a sub-globose capsule, c. 4.5×3.0 cm, pinkish-maroon.

Flowering and fruiting: May–September.

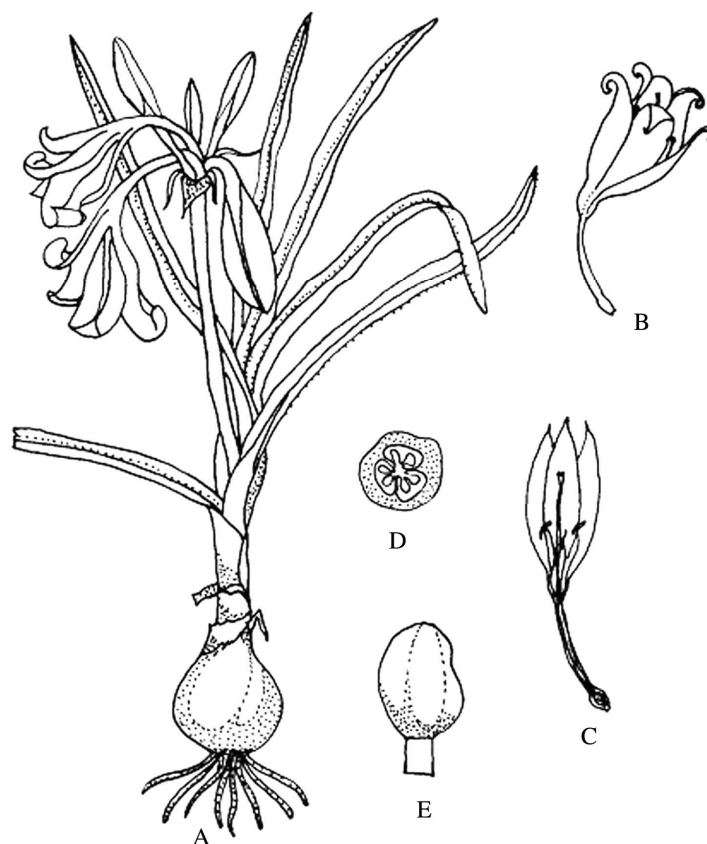


Fig. 6. *Crinum latifolium* L.: A. Habit (×0.1); B. Flower (×0.1); C. L.S. of a flower (×0.1); D. T.S. of ovary (×2); E. Fruit (×0.4).

Specimens examined: **Dhaka:** Dhaka University Botanic Garden, 28.04.2007, Sumona 24 (DUSH); Dhaka University Campus, Science Library, 19.09.2007, Sumona 44 (DUSH); *ibid.* 20.08.2012, Sumona 74 (DUSH).

Chromosome number: $2n = 22, 33$ (Kumar and Subramaniam, 1986).

Habitat: Soil rich in organic matter.

Distribution: Native to tropical Asia. Distributed throughout Sri Lanka, India and Myanmar, also in Malaysia and Africa. In Bangladesh, it is cultivated in different gardens.

Economic value: The bulbs are extremely acidic. In India, when roasted, they are used as rubifacient, or crushed on piles and abscesses to cause suppuration. Leaf juice is used for ear-ache (van Valkenburg and Bunyapraphatsara, 2002). Crushed and roasted bulbs are used in rheumatism (Sinha, 1996).

Ethnobotanical information: In some parts of India bulbs are used in traditional medicine (Kehimkar, 2000).

Propagation: By bulbs.

Crinum pratense Herb., Amaryll.: 256 (1837). Hook. f., Fl. Brit. Ind. 6: 282 (1892); Prain, Beng. Pl. 2: 798 (1903); Cooke, Fl. Pres. Bomb. : 750 (1908); Hassan, Encycl. Flora & Fauna of Bangladesh 11: 342 (2007). *Crinum longifolium* Roxb., Fl. Ind. 2: 130 (1832). *Crinum lorifolium* Roxb. ex Ker-Gawl., J. Sci. Arts 3(5): 110 (1817).

Bangla names: *Sukhdarshan*, *Bon Peyaj*.

A bulbous perennial herb, bulb ovoid or spherical, 10-13 cm in diameter, neck 5-7 cm across. Leaves 45-90 cm long, linear, channelled, sub-erect or declinate, entire, obtuse. Scape c. 30 cm or more long, compressed, decumbent; spathe 5.0-7.5 cm long, deltoid-lanceolate. Flowers in umbels, white, fragrant, shortly pedicellate, bisexual, epigynous. Perianth tube 7.5-10.0 cm long, perianth lobes lanceolate. Stamens 6, adnate to the throat of the perianth tube; filaments filiform, red; anthers oblong, dorsifixed, bursting longitudinally. Carpels 3, syncarpous; ovary inferior, 3-celled; style single; stigma simple. Fruit a capsule.

Flowering and fruiting: May–August.

Specimen examined: **Dhaka:** Dhaka University Botanic Garden (originally collected from Chanbari beat of Rema-Kalenga Wildlife Sanctuary in Habiganj), 01.06.2000, Zashim Uddin 835 (DACB).

Chromosome number: $2n = 22$ (Alam *et al.*, 1998).

Habitat: Plain lands, also on the bank of channel (Uddin and Hassan, 2004).

Distribution: Plains of India and Myanmar. In Bangladesh, it is found both in wild and planted in household gardens.

Economic value: Used as an ornamental herb.

Propagation: By bulbs.

Crinum stenophyllum Baker, Gard. Chron. 1: 786 (1881); Handb. Amaryll. : 75 (1888); Hook. f., Fl. Brit. Ind. 6: 281 (1892); Hassan, Encycl. Flora & Fauna of Bangladesh 11: 342 (2007).

Herbs. Leaves 90×0.6 -1.0 cm, linear, flaccid. Scape very slender, 2-edged. Inflorescence umbel, 4-6 flowered. Spathe c. 5 cm long, lanceolate. Pedicel c. 0.6 cm long. Perianth tube 7-10 cm long, very slender, lobes half as long or longer.

Specimen examined: No specimen was examined because of unavailability in nature and in any herbarium of Bangladesh.

Distribution: India, Bangladesh and Myanmar.

Notes: J.D. Hooker reported this species from Sylhet district in 1892. Since then there has been no further report of its occurrence from anywhere Bangladesh and no specimen available at any herbarium of Bangladesh. Hence, the species is presumed to be extinct in Bangladesh.

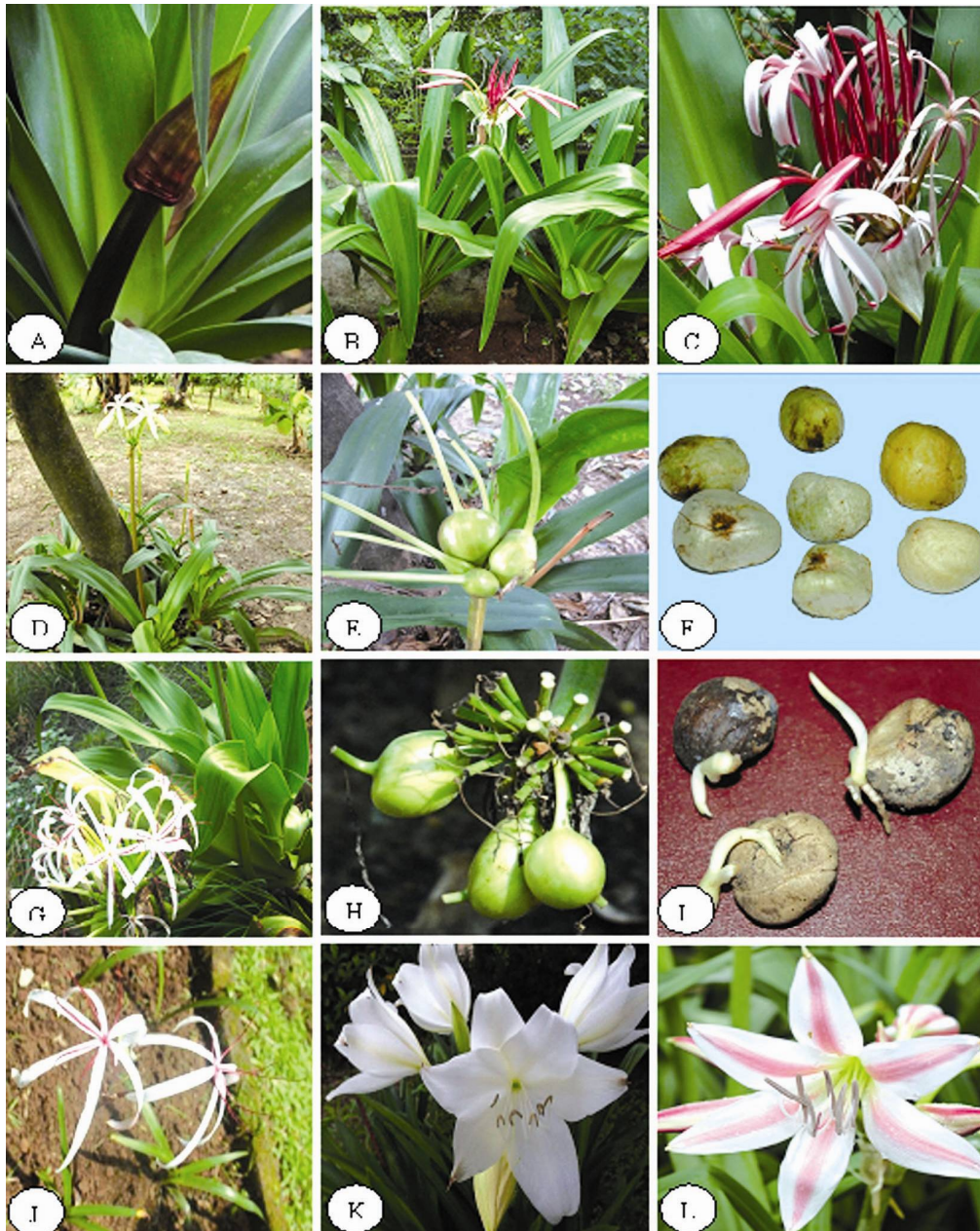


Fig. 7. Photographs of *Crinum* L. species: A-C. *Crinum amabile* Donn; D-F. *C. amoenum* Roxb.; G-I. *C. asiaticum* L.; J. *C. defixum* Ker-Gawl.; K. *C. jagus* (Thomps.) Dandy; L. *C. latifolium* L.

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