

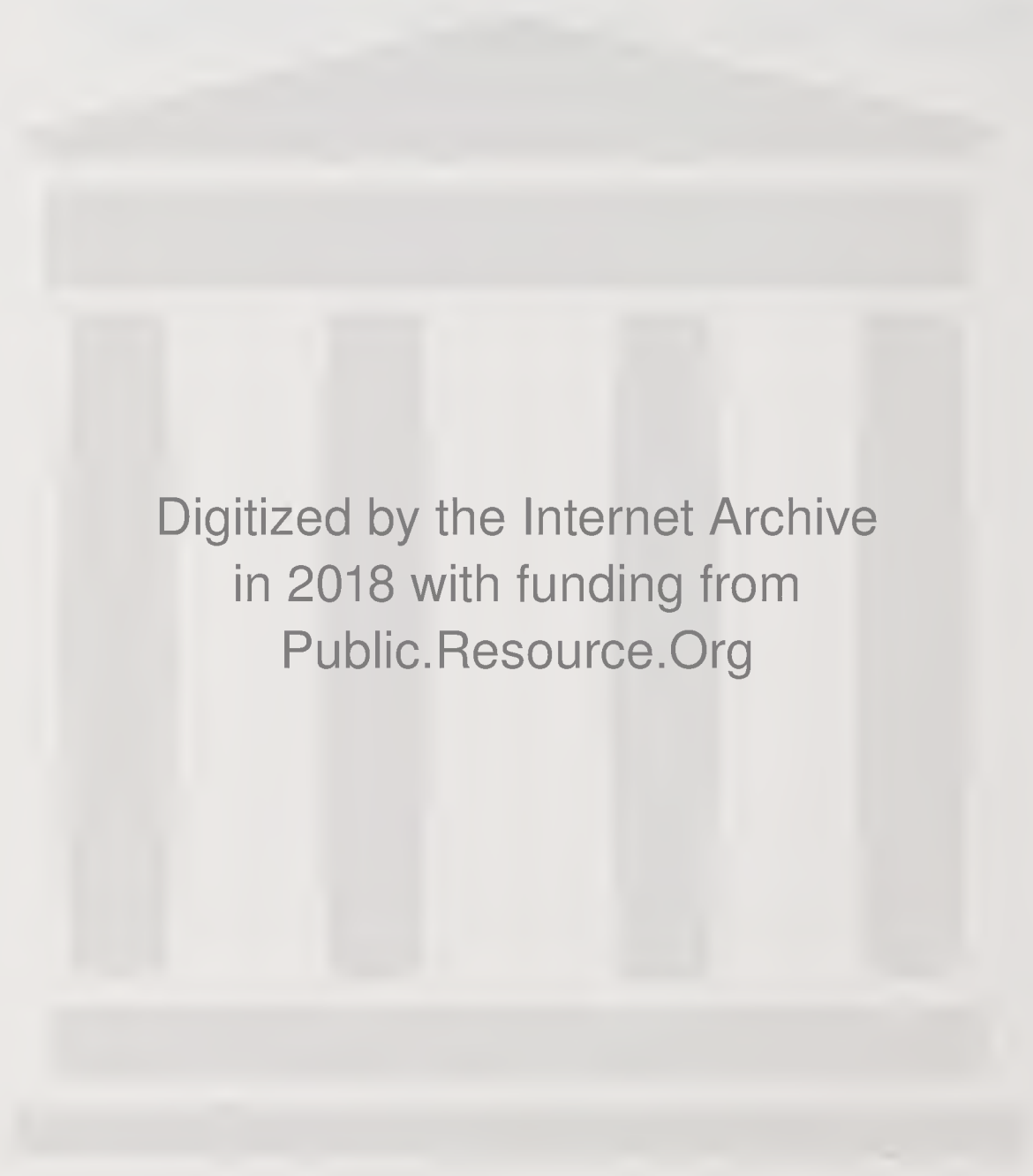
BEAUTIFUL
BULBOUS
FLOWERS

B. B. SHARMA



PUBLICATIONS DIVISION

BEAUTIFUL BULBOUS FLOWERS



Digitized by the Internet Archive
in 2018 with funding from
Public.Resource.Org

**BEAUTIFUL
BULBOUS
FLOWERS**

B.B. SHARMA



PUBLICATIONS DIVISION
MINISTRY OF INFORMATION & BROADCASTING
GOVERNMENT OF INDIA

First print 2002 (*Saka 1924*)

© Publications Division

ISBN : 81-230-0974-7

Price : Rs. 125.00



Published by the Director, Publications Division,
Ministry of Information & Broadcasting, Government of India,
Patiala House, New Delhi-110001.

• **Sales Emporia • Publications Division**

- Patiala House, Tilak Marg, New Delhi-110001
- Super Bazar, Connaught Circus, New Delhi-110001
- Commerce House, Currimbhoy Road, Ballard Pier, Mumbai-400038
- 8, Esplanade East, Kolkata-700069
- A Wing, F Block, Rajaji Bhawan, Besant Nagar, Chennai-600090
- Press Road, Near Govt. Press, Thiruvananthapuram-695001
- Block No. 4, 1st Floor, Gruhakalpa Complex, M.J. Road, Hyderabad-500001
- 1st Floor, 'F' Wing, Kendriya Sadan, Koramangala, Bangalore-560034
- Bihar State Co-operative Bank Building, Ashoka Rajpath, Patna-800004
- 27/6, Ram Mohan Roy Marg, Lucknow-226001
- Ambica Complex, 1st Floor, Above UCO Bank, Paldi, Ahmedabad-380007
- Naujan Road, Ujan Bazar, Guwahati-781001

• **Sales Counters • Press Information Bureau**

- C/o PIB, C.G.O. Complex, 'A' Wing, A.B. Road, Indore (M.P.)
- C/o PIB, 80, Malviya Nagar, Bhopal-462003 (M.P.)
- C/o PIB, B-7/B, Bhawani Singh Road, Jaipur-302001 (Rajasthan)

Typeset by: M/s Quick Prints, New Delhi-110028

Printed at: Mehta Offset (P) Ltd., New Delhi-110028

PREFACE

Man's fondness for flowers for their fragrance and beauty is well-known. Flowers are an essential part of a garden. Bulbous flowers exhibit an astonishing diversity in bewildering array of colour and charm and are extensively used to provide interest and colour before other plants have started to grow. They are particularly suitable to areas where a rich, colourful effect is needed perhaps for a short period.

In view of international co-operation, extensive exploration, collection, assessment and genetic improvement programmes, numerous new charming additions to the existing successful garden forms in bulbous flower crops have taken place in India and elsewhere. The range of easily available hybrids and varieties today far exceeds which were obtainable several years ago. Bulbous flower gardening has therefore been brought within the reach of anyone who has even a few yards of soil or pots. "The bulbous flower world" has become thus a dynamic market place with shifting production centres, new introductions, emerging markets and improved cultivation technologies. With the presence of temperate, sub-tropical and tropical climates, India has become the important source of supply for fresh cut flowers and planting material that can successfully meet specific market requirements. The beginners, often do not know what to choose from the vast array of popular bulbous flowers. The difficulty lies in not knowing the correct botanical name by which to refer a plant, being unable to identify a specimen seen in a garden, flower show or publication or not having elementary information on a particular species.

Efforts have been made to collect basic information and photographs on selected bulbous flower species from numerous sources catalogues to keep knowledge up to date on flower

characters, in particular in this publication in a simple elementary manner.

I am most grateful to Shrimati Surinder Kaur, Director (Publications Division) Ministry of Information and Broadcasting, Government of India for her interest and encouragement at every stage of this book's preparation.

It is my sincere wish that bulbous flower enthusiasts would find it useful.

Residence : A2/22
Paschim Vihar
New Delhi-110063

B.B. SHARMA
Former Professor of Horticulture
Indian Agriculture Research Institute
New Delhi-110012

CONTENTS

Achimene	1
Aconite	3
Amazon Lily	4
Begonia	5
Bell Agapanthus	8
Belladonna Lilly	9
Butter Cup	12
Calla Lily	15
Crinum	17
Cat's Tail	18
Corn Lily	20
Crown Imperial	22
Cyclamen	23
Daffodil	25
Dahlia	31
Day Lily	39
Desert Candle	39
Dog's Tooth	42
Football Lily	43
Freesia	44
Garland Flower	46
Gay Feather	47
Glory Lily	48
Gloxinia	49
Grape Hyacinth	50
Hippeastrum	52

Hyacinth	56
Indian Shot	59
Iris	61
Jacobeian Lily	66
Kafir Lily	66
Leopard Flower	67
Ligularia	68
Lilium	69
Lily of the Valley	74
Lotus	75
Ornamental Onion	77
Oxalis	79
Peruvian Lily	80
Plantain Lily	82
Saffron	83
Snake Lily	86
Snowdrop	87
Snowflake	87
Spider Lily	88
Star of Bethlehem	89
Sword Lily	91
Torch Lily	93
Tuberose	94
Tulip	96
Water Lily	100
Wind Flower	101
Zephyr Lily	103

ACHIMENE

FAMILY : GESNERIACEAE

*Other common names : Magic flower, Nut orchid,
Widow's tear*

The waxy and long lasting Achimene flowers please the eyes in several colours ranging from near pink to lavender and from pale to dark blue. Usually with white throat and light fragrance, they sometimes have yellow or violet spots. Some are pure white, some reddish white and still some are crimson. Achimene mainly flowers during rainy season though the flowers appear from June to November. It is a group of dwarf plants (15-60cm) and can be grown in hanging baskets and pots lending charm and grace to homes and gardens. The origin of Achimene is Guatemala and Mexico.



Achimenes hybrid

It grows well in medium to high elevations than in plains but it is frost tender. Needs warm temperature throughout its growth. It thrives well in minimum temperature

of around 10°C. It should not be grown in direct sunlight. Artificial light for 14-16 hours a day is ideal. The plant needs plenty of water and can not stand water starvation.

The tubers, about 5 or 6, are planted usually during February-April in flat containers at a depth of 2.5cm in light soil and watered soon. The previous year's tubers are broken into small pieces (1.25cm) when the plant is dormant and planted.



Aconitum



Tuberous roots of Aconitum

Most *Achimenes* grown are hybrids. *A. longiflora* with pear-shaped, scaly and white rhizomes is a popular species. Other species grown in gardens are:

(i) *A. erecta* (Syn. *A. coccinea*, *A. rosea*) yields brilliant crimson flowers, (ii) *A. heterophylla* (Syn. *A. giebrechtii*) gives dark reddish orange flowers with yellow throats, (iii) *A. tubiflora* (Syn. *A. dolichoderia*) provides large potato-like tubers (iv) *A. alba* gives white flowers, (v) *A. grandiflora* blooms crimson coloured flowers.

ACONITE

FAMILY : RANUNCULACEÆ

Other common names : Helmet flower, Monkshood, Wolfs bane

Aconitum is derived from the Greek word “**akoniton**”, which is the name of the plant used for poisoning wolves and panthers. All species of monkshood are poisonous. It

originated in Asia, Europe and north America.

In Aconite, the leaves are deeply cut and the curiously helmeted flowers bloom in blue, rose and white colours. They are borne in clusters along a long axis, the youngest crowning the cluster at the apex. Usually, the floret number is 20-30. The sap is poisonous and protective gloves are necessary while cutting the flowers for fresh use when the first cluster of florets have fully opened. It provides feast of colours for rock gardens, borders and under the trees.

Aconite grows well in well-drained soil with plenty of organic matter in partial shade. It likes moist conditions. It is propagated easily from tuberous roots during spring in hills. It can withstand temperatures as low as -15°C . The tuberous roots are planted 2.5-5cm deep in the soil with a spacing of 60cm.

The most versatile species for the garden is *Aconitum napellus* offering blue or violet blooms from 100cm high plants. *Aconitum X bicolor* hybrid produces hooded violet-blue and white flowers on 120cm high plants. *Aconitum fischeri*, about 150cm high produces light, purple blue flowers and is popularly cultivated in hill gardens. *Aconitum carmichaelii* is 120-180cm high. It is an imposing long flowering and long-lived perennial with pyramids of beautiful 5cm flowers.

AMAZON LILY FAMILY : AMARYLLIDACEAE

Other common name : Star of Bethlhem

Amazon lily is otherwise known as *Eucharis amazonica*. Eucharis is a Greek word which means "very graceful". Typical of this word, Amazon lily is grown for its fragrant white flowers that resemble large white daffodils with a cup and 6 spreading petals. It flourishes in places where the

minimum temperature is around 15°C and is, thus, frost tender. It prefers at least 50 per cent relative humidity and spreads upto a height of 60-100cms. The plant originated in Columbia.

It needs partial shade and humus rich soil and free irrigation in summer. It is propagated by seed when ripe or by offset during spring in hills in a protected location. It thrives better in the plains than on the hills. The bulbs are planted during September-October in plains. It looks elegant in pots and borders. It is useful as an indoor plant and for fresh use.

The popular name, star of Bethelhem is also applied to *Ornithogalum*. *Eucharis grandiflora* (*Eucharis amazonica*) is an evergreen clump forming bulb with strap shaped leaves and bears a head of upto 6 fragrant, slightly pendent white flowers at almost any time on 40-60cm high plants.

BEGONIA

FAMILY : BEGONIACEAE

The Begonias are grown for their colourful flowers and ornamental leaves. The Begonias cover an immense diversity of species and varieties. These flowers are divided into several groups according to cultivation and multiplication requirements and stem, foliage and flower characters.

The tuberous-rooted group, grown as annuals for their single flowers, does not grow well in the plains. The tuberous-rooted begonia is considered to be the queen of summer bedding plants. Large-flowered, double types known as *BX tuberhybrida* are most charming. Its rose like blooms measure 8cm-15cm across with serrated or smooth edged petals, self or bicoloured in huge range of shapes and colours namely pink, salmon, orange, apricot, rose, white with rose pink, bright red, pink and white, scarlet, yellow

and many more. The blooms may resemble camellias or carnations or daffodils. The plants may grow 30-45cm high. Other species of importance are : (i) *Begonia multiflora maxima* looks most beautiful with masses of double blooms on 15cm high bushy plants. Besides this, other free flowering variations are multiflora and grandiflora. *Begonia pendula* known as hanging begonia with a drooping habit and



Begonia hybrid (Dragon wing begonia)

profuse small double or semi-double flowers are suitable for hanging baskets in tuberous-rooted class. F₁ hybrid seeds in this division produce large flowered hanging begonias in true double form in shades of pink with many cream centres and several other combinations. The easiest method of propagation is from seeds, tubers or cuttings from tubers during February-March in hills. Dwarf multiflora and pendula are propagated from cuttings and tubers. The tubers can be divided when the shoots are small. The tuberous-rooted begonias love a deep humus-rich soil with little or no lime present. They flower beautifully in light shade.



Hybrid begonia semperflorens

The rhizomatous begonia is the rex begonia (*Begonia rex*) and is a native of India. It is prized for its attractive foliage. The leaves are fan-shaped and lop sided, hairy with toothed edges and silvery white or deep crimson with handsome patterns. In some rex begonias the leaves have glistening metallic sheen. In this group too, the creeping rhizomatous types are more useful for hanging baskets. The begonias under rhizomatous and rex types prefers a minimum temperature of 18°C and relative humidity of 45-75 per cent. The easiest method of propagation is by leaf cuttings and division of rhizomes and this is best done during October-November for flowering in February-March.

The best known sub-class in fibrous-rooted group is Semperflorens and it grows well in the plains in a humid, cool and semi-shaded environment. They can be grown in open beds between November to February in cool plains

and in summer they are taken out of the beds and transferred in pots in shade. Its green, bronze or variegated leaves and the shell like single or double flowers in various charming colours such as pale to deep pink, salmon, red, orange and white pleases every nature lover. F₁ fibrous-rooted begonias (*Begonia X semperflorens-cultorum*) are vigorous, heat tolerant and can be raised by seeds and the crop time is 15-18 weeks. In beds and pots, they make a beautiful garden feature. This group can also be easily propagated by stem and tip cuttings.

Cane-stemmed group requires a minimum temperature of 10°C and flowers in large, pendulous clusters. The growing tips are pinched out to encourage branching. In winter-flowering group, the leaves are green or bronze and the flowers are single, semi-double or double. It is frost tender and grows well in minimum temperature of 10°C. Indirect sun and moist soil is preferred.

BELL AGAPANTHUS

FAMILY : LILIACEÆ

Other Common Names : Blue African lily, Lily of the Nile, Drooping agapanthus

In blue African lily bell or trumpet shaped flowers, usually blue and often fading to purple with age, are very attractive. Some garden forms also produce white blooms on umbels. It is mostly suitable for cultivation at an elevation of 1000-2000 metres in hills in pots, beds and borders. It originated in Cape Colony (Africa).

Agapanthus grows well in full sun in moist but well drained soil. It may grow in shade but production of flowers will be reduced. It can withstand temperatures down to – 5°C. Agapanthus is a summer flowering plant and the flowers are long lasting.

The species can be propagated in spring from fleshy roots, divided from clumps with a knife.

Agapanthus africanus is quite popular and is evergreen.

BELLADONNA LILY FAMILY : AMARYLLIDACEÆ

Other common name : Amaryllis

It is one of the earliest bulbous flowers which starts showing up right from the beginning of the spring season. The large



Amaryllis gracilis



Bulb of Amaryllis gracilis

and sweet-scented flowers of belladonna lilly behold the onlookers in several colours—deep rose, rose, scarlet red, dark red, white with red stripes, pink with yellow throat, rose-pink with white centre, orange etc. It comes from south Africa. It is frost hardy and can withstand temperature down to -5°C . It thrives well both in plains and in hills. This 60-90cm high plant with brown, rounded, large bulbs has deciduous foliage. In summer the flower panicle shows up while in milder climate the leaves may die down and the bulb becomes dormant.

The plant needs well-manured soil, lot of moisture and

*Crinodonna**Bulb of Crinodonna*

sunlight for proper growth. Planting is during March-April in hills and September-October in plains. In colder hills the bulbs are planted deep 12-15cm below the soil. In plains they are planted with necks just above soil. In both cases soil must be well drained before planting and the bulbs should be dry when leaves are dead. When the spikes emerge water

the plant lightly at intervals maintaining optimum moisture. Stop watering when leaves die out. Though the bulbs can last 4-5 years, it is better to dig out and replant annually with sand and organic matter. For pots use porous soil mixture and water only after the spikes look up. Lift parent bulbs only when offsets are required for further planting. Seeds from pods, though not fully ripe, are also useful for multiplication and they germinate readily.

There are a number of intergeneric hybrids using *A. belladonna* and *Crinum*, *Nerine* etc. *Crinodonna*, a hybrid of *Amaryllis belladonna* and *Crinum* is popular for its big multi-flowered umbels. The flowers of royal Dutch hybrids *Amaryllis* are very large (20-25cm). There are also small flower types like *gracilis* hybrids yielding good number of blooms.

BUTTER CUP

FAMILY : RANUNCULACEÆ

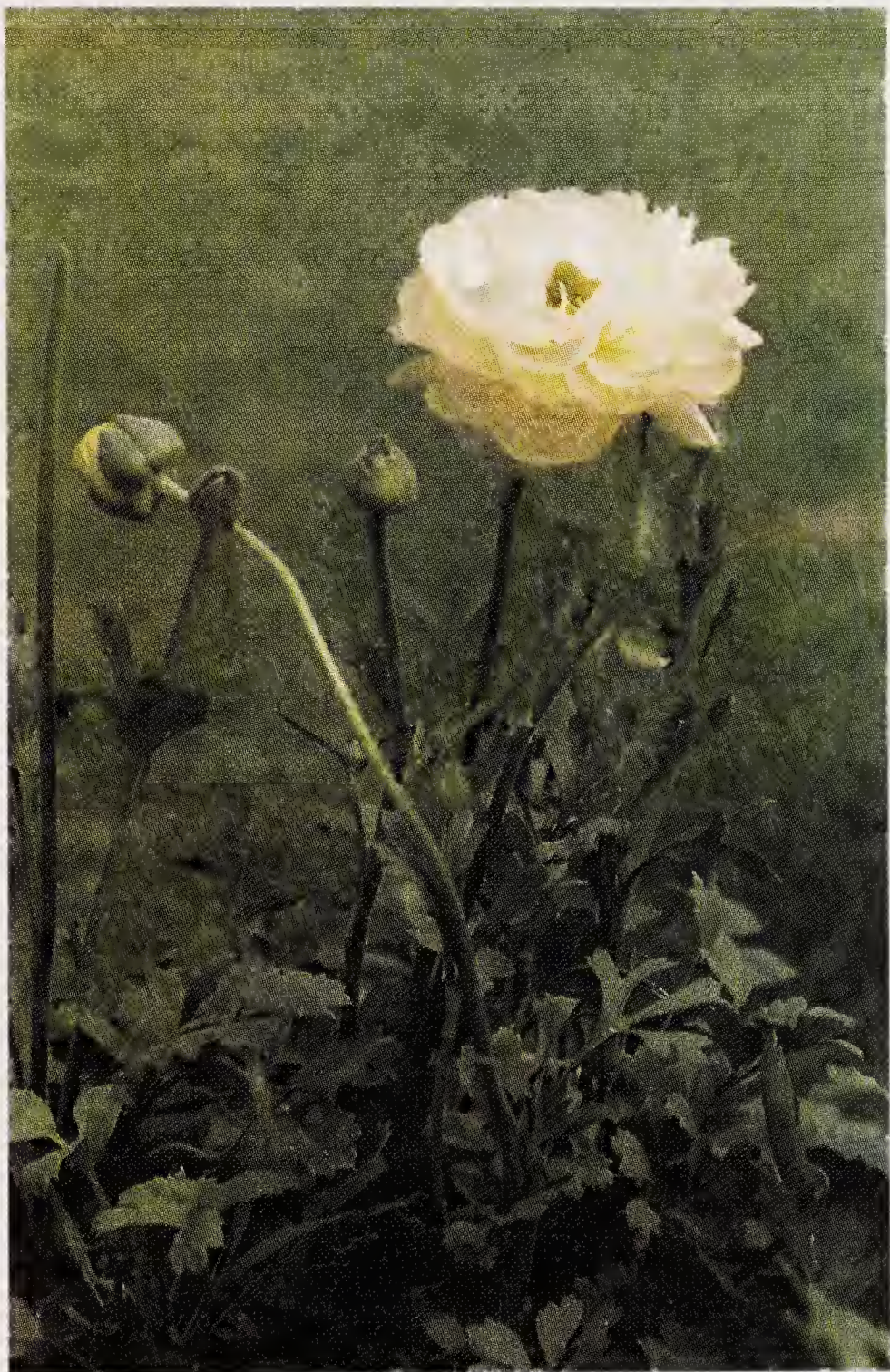
The buttercup is a popular plant with attractive flowers. It is an elegant cut flower with fully double rose-like blooms. It is quite popular for landscaping and public gardens. Pot grown *Ranunculus* is extremely graceful and provide rich display of spring colours, both in hills and in cool plains. As a cut flower, it reaches a height of 40-50cm and there is a full range of colours—white, pink, rose mauve, red, orange, yellow, gold, purple, scarlet and many more. For fresh use it is cut when the flower is fully open. Flowering potted *Ranunculus* plant is marketed when 2-3 flowers have fully opened.

It thrives well both in hills and in cool plains. It withstands even sub zero temperatures upto -15°C . The origin of this plant is Southern Europe and Asia.

The tubers are taken out after flowering in cool plains and are used in next planting in October. The best time for planting in hills is March-April and tubers can be left in the

beds if the minimum temperatures are not too low. The tubers are placed with claws downwards and the crowns of the tubers are kept 5cm under the soil. The planting space may be 8-10cm from tuber to tuber. The flowers appear in February-March in cool plains and in May-June in hills. Any well-drained soil with plenty of humus is good for its cultivation.

The common types are Turban, Turkish and Persian



Ranunculus

Ranunculi. The most popular species is *Ranunculus asiaticus*—the common garden Ranunculus or Persian buttercup or French Ranunculus. It has claw-like tubers. F₁ seeds of *Ranunculus asiaticus* produce compact 20-26cm



Tuberous root of Ranunculus

well-branched plants that finish uniformly between colours. The colours are pink, pure yellow, purple, red, rose, tangerine, white and many more. In hills, the crop time is 6-7 months. It produces single or double flowers in red, white, pink, yellow or purple. Modern varieties of Persian buttercup have a wide range of flower colours. The height of the plant is 45-60cm and the spread is 10-12cm. In *Ranunculus grandiflora*, a garden strain produces long stems and is of free flowering habit. The colour range is huge in this strain. *Ranunculus aconitifolius* is commonly called white bachelor's button. The height of the plant is 60cm. In a garden form of this species, double pure white flowers are borne on strong stems. *Ranunculus acris* (Meadow buttercup) bears double golden yellow flowers. The height and spread of the plant is 50-60cm.

CALLA LILY**FAMILY : ARACEAE**

Other common names : Arum lily, Pig lily, Trumpet lily

Calla lily is an adorable fragrant cut flower plant usually evergreen in warm climate and is grown for its erect funnel-shaped spadix. It originated in south Africa and grows well in areas where minimum temperatures during winter remain around 4°C to 8°C though it can also withstand temperatures down to -15°C when protected with mulch in winter or grown in containers. The plants are propagated by division of rhizomatous roots during October in hills and mild cool plains. The flowering takes place at the end of March. It needs full sun or partial shade and rich well-drained soil.

The most popular species under cultivation is *Zantedeschia aethiopica* (Calla lily). It produces a succession of arum-like, white spathes each with a yellow spadix on



Zantedeschia aethiopica



Rhizome of Zantedeschia aethiopica

60-140cm high plant. For fresh use, it is cut when the flower is fully coloured.

CRINUM

FAMILY : AMARYLLIDACEAE

Other common names : St. John's lily, Cape lily

Crinum originating from south Africa is a very attractive bulbous plant that is extensively loved for its often fragrant, funnel-shaped white or pinkish red flowers borne in a cluster of 8-12 blooms in scape. The flowering is profuse in summer and rains. It may grow in areas where winter temperatures may go down to 0°C, but it is usually frost tender. It thrives well at minimum temperature of 16°C. The bulbs are quite expensive and should be planted in a well-drained, moisture retentive soil in a sheltered sunny spot. It can be grown in pots, borders and along the edges of the pools. The bulbs are planted during February-March both in hills and plains. Crinum hates sorts of disturbances. Bulbs can be taken out from over-crowded plants during spring



Crinum asiaticum

both in hills and cool plains. These plants can be retained at one location for 4-5 years.

The most reliable species is *Crinum X powellii*. Leafless flower stems bear heads of fragrant funnel shaped pink flowers. The height of the plant is upto 100cm and the spread is 60cm. In *Crinum X powellii* 'album', the fragrant blooms are white.

The second commonly grown species is *Crinum asiaticum*. The leafless flower stem produces heads of long-tubed, white flowers with narrow petals. The height of the plant is 45-60cm and the spread is 60-100cm. It thrives well in areas where minimum temperature comes down to 16°C. *Crinum campanulatum* (water crinum) is an unusual species that can grow in shallow water.

CAT'S TAIL

FAMILY : LILIACEAE

Other common names : Rooi dirk, Swart turk

It is one of the attractive bulbous flowers which starts showing in late winter to early spring. The large sized multiflowered raceme upto 20cm long bearing orange yellow and white flowers look at the visitors with a fragrant smile. The flower number is more than 100. It comes from South Africa. It is popular in areas where minimum temperature fluctuate in the range of -6°C to 8°C and so it is easy to grow in hills and cool plains. It is mainly cultivated for garden and fresh flower use and is cut when several florets have fully colored. This 60-80cm high plant has 1-2 stems and green foliage.

It requires well-drained, humus rich soil and sunny location. The rhizomatous swollen roots are planted with 2.5cm soil over them at 20cm apart. The bulbs are stored at 17°C to 20°C.



Bulbinella latifolia

Bulbinella latifolia and *Bulbinella nutans* are the only important popular species.

CORN LILY

FAMILY : IRIDACEÆ

The Corn lily is a winter and spring bulbous flowering plant with flowers in yellow, red, green, pink and several other colours and is useful for fresh use. It produces six-petalled stars on wiry stems and the centre is usually dark red or brown. Its home is South Africa and thrives well in areas

*Ixia hybrid*



Corm of Ixia hybrid

where minimum temperature remains within the range of -6°C to 4°C . The best plan for cool plains is to plant in October and then lift the corms after flowering and fading away of leaves. The corms are stored in a dry place. It grows in open, sunny situation and well-drained soil. It is propagated by seed and offsets in autumn. In cool plains when minimum temperature comes down to 4°C , it can be planted in October. The corms are planted 13cm deep and 6cm apart.

Ixia hybrida is available in a number of named varieties. The flower colours are mostly red, pink, yellow, cream and white on multiflowered spike that carries 6-20 florets on 40-50cm high plants. For fresh flower use, it is cut when 1-2 florets have opened. In *Ixia viridiflora*, the spike carries jade green blossoms, 2.5-5cm across with purple-black eyes on 30-60cm high plants. The spread of the plant is 5-6cm.

CROWN IMPERIAL

FAMILY : LILIACEÆ

Other common name : *Fritillary*

The stately Crown imperial is a graceful and imposing plant quite unlike other closely related fritillary group of plants. At the top a head of upto 5 widely bell-shaped (5cm cups) with yellow, orange or red pendent flowers, 5cm long appear in Crown imperial on upto 150cm high plant.

The flower head is unusual—the odour is best considered as strange and there is a crown of small leaf-like bracts. It is suitable in herbaceous or shrub border. It is fully to frost hardy and can, thus, withstand temperature down to -5°C to -15°C . The origin of this plant is Europe, Asia and North America.

Fritillaria grows well only on hills. It needs full sun or partial shade and well drained moist soil with some well-rotten compost every year. The soil dry out slightly in summer and should not become sunbaked. It is propagated by offsets in August to November or by seed in winter or autumn. The bulbs are planted quite deep, 12-20cm and 30cm apart. The plants are generally not disturbed for several years. *Fritillaria meleagris* is planted 12cm deep and 20cm apart. The bulbs of *Fritillaria imperialis* are placed at a depth of 20cm and 45cm apart. The clumps can be divided every four years. In hills it flowers in April-May. Some species of *Fritillaria* are very popular. The most popular is *Fritillaria imperialis* (Crown imperial). Its 'Rubra maxima' variety is very robust with red flowers. The spread of the plant is 25-30cm. *Fritillaria meleagris* is a plant for the rockeries, front of the border or naturalising in grass. It has solitary bell-shaped prominently chequered flowers in shades of pinkish-purple or white on upto 30cm high plants (Snake's head fritillary).

Fritillaria pyrenaica develops broadly bell-shaped flowers with flared-tipped chequered deep brownish or blackish purple petals on 15-30cm high plants. The spread

of the plant is 6-8cm. *Fritillaria acmopetala* 15-35cm high produces 1-2 broadly bell-shaped green flowers, 3-4cm long with brown-stained petals flaring out ward at tips. *Fritillaria persica* bears a spike of 10-20 or more narrowly bell-shaped deep blackish purple flowers, 1.5-2cm long on upto 150cm tall plants.

CYCLAMEN

FAMILY : PRIMULACEÆ

Majority of gardeners consider Cyclamen as a pot plant—heart shaped and attractively marked leaves with fleshy stalks. Originating from the Mediterranean region the colour of the flowers are delicate pastel shades of pink or purple or red or white and of various other hues. The flowers have reflexed petals in a windblown manner looking like fairy butterflies with their wings swept back. In some varieties the flowers are fringed, frilled, margined and fragrant. There are thousands of varieties available to choose—mini, intermediate and standard hybrid cyclamens, etc.. There are miniature hardy versions with 2-5cm flowers to grow. Further own



Cyclamen persicum

time of flowering can be chosen—these are winter, spring, summer and autumn varieties.

Cyclamen does not grow satisfactorily in the plains but thrive exceedingly well in the hills in a protected corner. It can withstand temperatures down to -1°C to -12°C in hills. A well-drained, humus rich soil, and cool, moist, partial shade is required for this plant. It lasts only one year if cultivated in plains where the winter is long and cool. The plants are raised from seeds or corms. It is easier to grow plants from corms. The corms are planted in February on the hills or in August for indoor decoration when the plants bloom well inside the room from December onward. In plains, the corms are planted in October. The corm is set about 50 per cent in and 50 per cent out of the soil in a pot. The seed is grown from August to November in pans. The seedlings are transferred into small individual pots in March-April. The plants thrive best where the temperature does not rise above 15.5°C . Cyclamens are excellent as cut flowers.



Cyclamen persicum

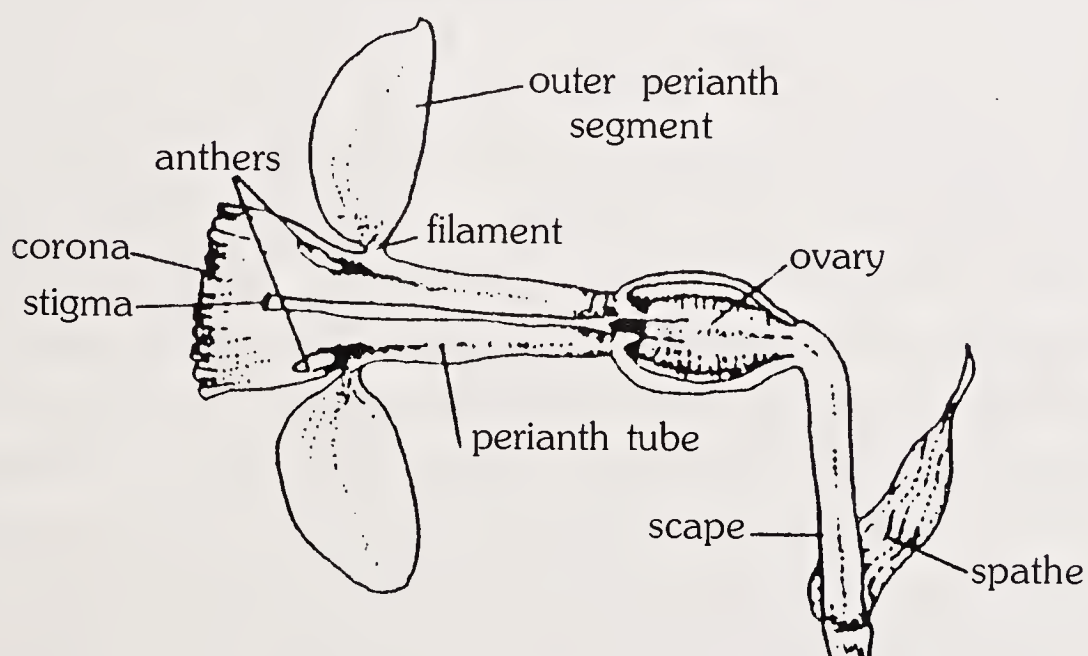
The popular florist's Cyclamen are tender plants selected from wild winter flowering—*Cyclamen persicum*. The commonly grown *Cyclamen coum* produces red, pink or white flowers in December-March. Another popular species is *Cyclamen persicum* var. *giganteum* in which the flowers are quite large in white, pink, purple, red and various other shades. In *Cyclamen hederifolium* var. *album*, pure white flowers with reflexed petals appear before or with leaves which vary but are often ivy-shaped with silvery green petals on upto 10cm high plants.

DAFFODIL

FAMILY : AMARYLLIDACEAE

Other common name : *Narcissus*

Narcissus is one of the most spectacular spring flowering bulbous plant. The common name 'Daffodil' is used when the central cup is as long as the petals or even longer. The short-cupped varieties are called the 'Narcissus'. However, both are grouped under the same botanical genus-Narcissus. The flower is borne on a long stalk. Each flower has a trumpet or a cup (the corona) and petals (perianth segments). It is fully hardy and can, thus, withstand temperatures down

Flower structure

Daffodil



Narcissus tazetta

to -15°C though known otherwise. The origin of this plant is northern hemisphere, Europe, British Isles, Canary Islands, Asia and North Africa. It prefers sun or light shade and well-drained soil but Tazetta cultivars prefer a sunny site and thrives well in lighter soils in beds and pots. *Narcissus tazetta*—paperwhite hybrid varieties grow well in areas where minimum temperatures are in the range of 1°C - 8°C . Dead-heading of the blooms is essential. Most cultivars increase naturally by offsets. The dense clumps are divided no sooner than 7 weeks after flowering after every three years. The species can be propagated by seeds in late summer or autumn in hills. The best time for planting of bulbs in cool plains is October while on the hills the planting can be done in September-October. The flowering takes place during December-March in cool plains and from December to April on the hills. The bulbs are placed 10-



Bulb of Narcissus tazetta

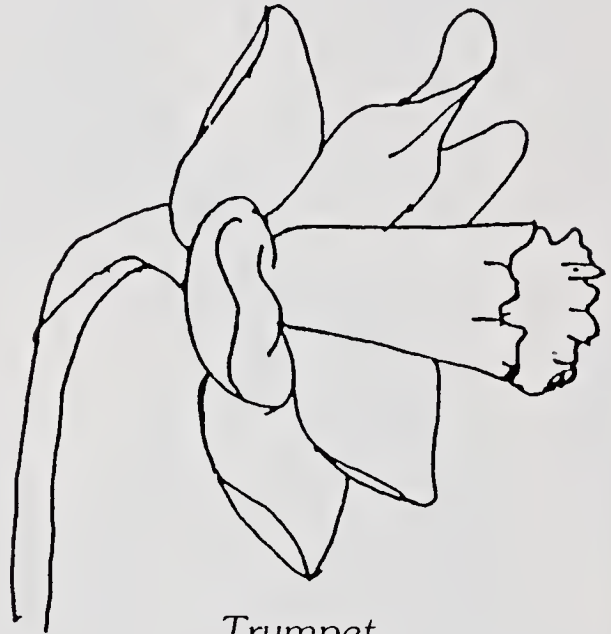
12cm deep and the nose is covered with the soil. After the flowering is over, irrigation is not given. The leaves turn yellow and die. Now the bulbs can be lifted if required.

There is immense variation in *Narcissus*. The *Narcissus* is divided in many classes as given below and in addition, there are two more classes-wild species and miscellaneous types.

TYPES IN NARCISSUS

CLASS 1
TRUMPET
(DAFFODILS)

These bear normally solitary flowers and produce a trumpet that is as long as, or longer than the petals. It is of early to late spring flowering type.



Trumpet

CLASS 2
LARGE-CUPPED

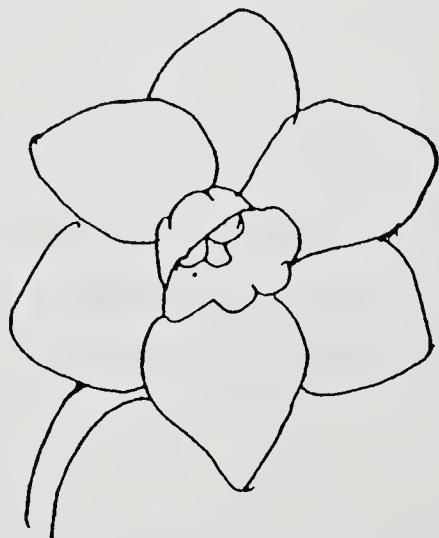
It produces solitary flowers. Each flower has a cup at least one-third the length of the petals but shorter than the petals. It is of spring-flowering type.



Large cupped

CLASS 3
SMALL-CUPPED

The flowers usually appear singly. Each flower has a cup not more than one-third the length of the petals. It is of spring or early-flowering type.



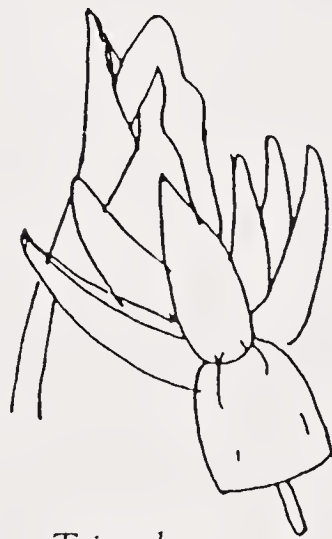
Small cupped

CLASS 4**DOUBLE**

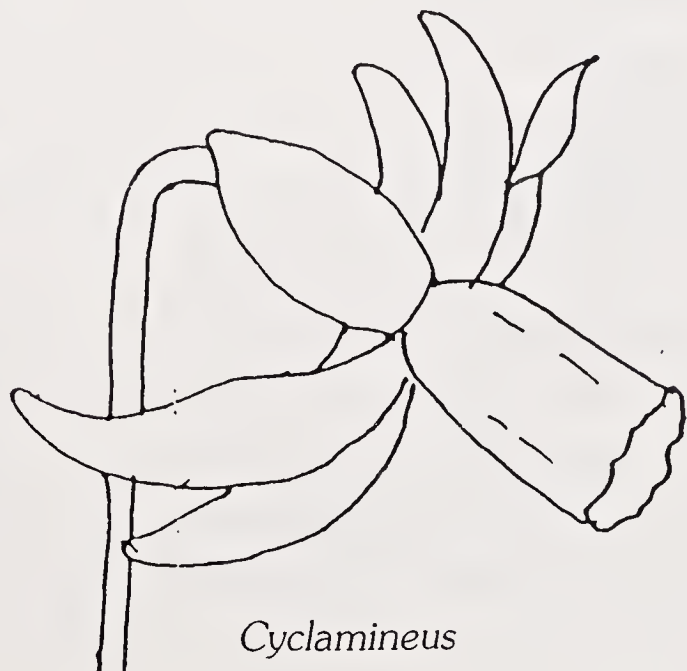
Usually this class has solitary big fully or semi-double flowers with the cup and petals. Many time the cup is replaced by petaloid structures. Some may have smaller flowers in groups of 4 or more. It is of spring or early flowering type.

*Double***CLASS 5****TRIANDRUS**

The flowers are nodding type. The flowers may have short or straight-sided cups and narrow reflexed petals appearing 2-6 per stem. It is of spring flowering type e.g. *N. Hawera hybrid*.

*Triandrus***CLASS 6****CYCLAMINEUS**

1 or 2 flowers per stem appear. The flowers have cup that are some times flanged and often longer than those of triandrus type. Petals are narrow pointed and reflexed. It is of early to mid-spring flowering type.

*Cyclamineus*

CLASS 7**JONQUIL**

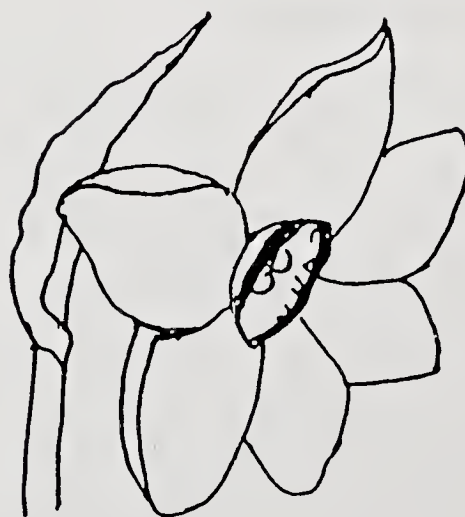
The flowers are scented and appear usually 2 or more per stem. The cups are short and may be flanged sometimes. The petals are many times flat, fairly broad and rounded. It is of spring flowering type.

*Jonquil***CLASS 8****TAZETTA**

The flowers appear in groups of either 12 or more per stem or 3 or 4 large ones. The cups are small and often straight-sided. The petals are broad and usually rounded. The flowers are fragrant. It is of late autumn- to mid-spring - flowering type.

*Tazetta***CLASS 9****POETICUS**

The flowers have a small coloured cup. The petals are glistening white. The flowers appear 1 or 2 per stem and are fragrant. It is of late spring or early summer flowering type.

*Poeticus*

CLASS 10**SPLIT-CUPPED**

The flowers are usually solitary and have cups that are split for more than half of their length. The segments of the cups lie back on the petals and are usually ruffled. It is of spring flowering type.



Split cupped

Some important species and hybrids are as under :
 (1) *Narcissus asturiensis* (*Narcissus minimus*) bears small lemon flowers that have waisted trumpets and slender petals. It prefers full sun. (2) *Narcissus cyclamineus* bears slender nodding clear gold flowers that have narrow reflexed petals and long, slender flanged, waisted trumpets.

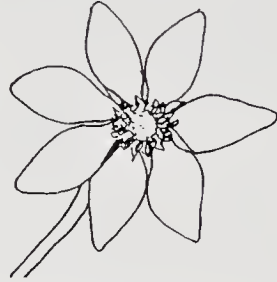
DAHLIA**FAMILY : COMPOSITÆ**

Dahlias have an interesting history. The first tubers arrived in Europe from Spanish settlers in Mexico. Andreas Dahl (after whom the plant is named) regarded it as a vegetable rather than a garden flower but the interest switched from edible tubers to the blooms when the first double flowers were bred in Belgium in 1815. The craze began. Dahlia is now very popular and a highly ornamental plant forming large bushy growth with dense flower heads which are good for cutting and exhibition. Dwarf forms are very popular for mass planting and are also suitable for containers. Their colour range includes almost all shades that one admires. The Dahlia flower consists of a certain number of outer ray florets in which male organs are converted into petals and these petals are arranged round a central disc of bisexual florets. The ray florets have all the colours except blue and the central disc is usually yellow.

Dahlias have been classified into several groups based upon the shape and size of flowers and formation of petals. Some of them are shown in the figures.

FLOWER TYPES IN DAHLIA

1. Each bloom normally possesses 8-10 broad petals encircling an open central disc.



Single

2. The fully double blossoms have one or more rings flattened ray petals encircling a dense mass of shorter tubular petals normally longer than disc petals seen in single dahlias.



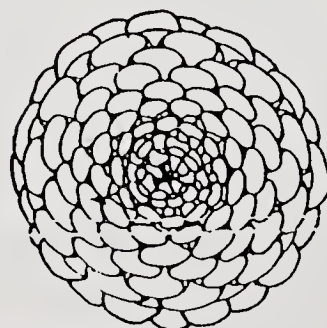
Anemone

3. The collerette blooms have broad outer petals (8-10) and an inner collar of smaller petals encircling an open central disc.



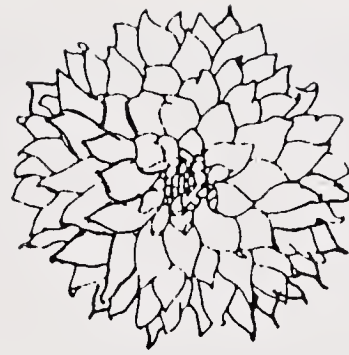
Collerette

4. The fully double blooms are flattened to spherical appearance and have dense, tubular petals.



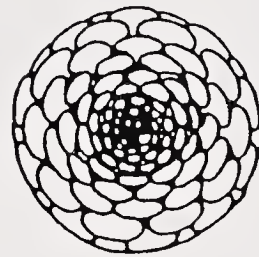
Ball

5. The fully double blossoms have broad, flat petals that incurve slightly at their margins. The petals may reflex to the stem.



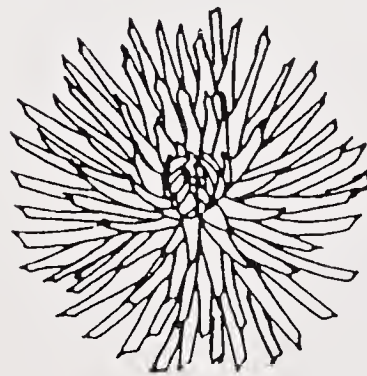
Decorative

6. Pompon double blooms are flattened to spherical appearance and are no more than 5cm across. These are miniature type of ball flowers.



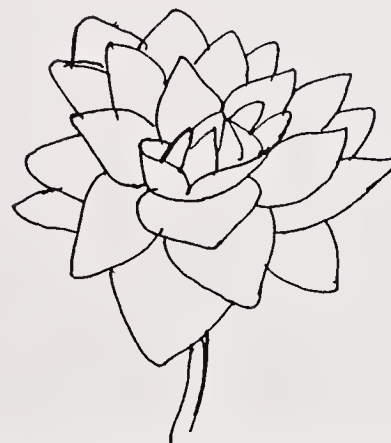
Pompon

7. The fully double blossoms have narrow pointed petals that may be straight or curl inward at times. The fully double show recurved edges for more than two-thirds of their length.



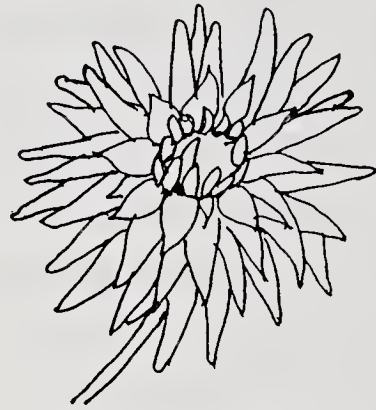
Cactus

8. These are fully double blooms displaying large generally sparse ray petals (flat or slightly incurved or recurved margins). The blooms exhibit a flat appearance.



Water lily

9. These blooms look like cactus flowers except that the petals are broad based. The edges of the petals are generally recurved towards their tips.



Semicactus

10. The blooms in this class are seen in several varieties and are different than the above 9 types.



Miscellaneous

The key below can guide in making choice to describe the bloom diameters of well grown decorative and cactus varieties.

Giant	More than 25cm
Large	20-25cm
Medium	15-20cm
Small	10-15cm
Miniature	Less than 10cm



Pompon dahlia



Cactus dahlia

Dahlia need not be an easy plant. The growing of Dahlia can be an exacting and absorbing hobby. There are soil and compost mixtures to prepare in the beginning of winter, cuttings to raise from tubers and shoots, growing point to pinch out to support formation of bush and large blooms, fertilizer to apply, side shoots to remove, plants to disbud, roots to be kept moist and show blooms to be put up in flower shows. In rearing a Dahlia plant for exhibition



Dahlia

purpose, some special techniques namely stopping, side-shooting and disbudding are practised. To make it bushy stopping is necessary by pinching out the tips of the main stems about 4 weeks after planting. Long stemmed plants are required for indoor decoration and exhibition. In side shooting, unwanted laterals from the main stem about 3 weeks after stopping are snapped. For larger (but fewer) flowers, disbudding is necessary and side-buds are removed leaving only the terminal flower bud. Regular removal of faded blooms and staking prolong the flowering life of the plant.

The Dahlia is an ideal subject for pots, borders and rockeries. Dahlia is propagated by ground tubers, pot tubers from garden shops, rooted cuttings and seeds. It thrives best in a deep humus soil which is not too dry but it can be adversely affected by prolonged wet conditions. A partial shaded to full sunny location should be selected for it. The tubers are planted at the end of June in the cool plains and



Dahlia pinnata

during March-April in hills. In cool plains, the rooted cuttings are transplanted into beds or pots in October and March-April in hills. Dahlias benefit from regular propagation to maintain vigour. The propagation from seed is never followed for the modern Dahlia hybrids except the single or bedding varieties. The seeds are sown in September-October in the plains and March-April in the hills. The planting distances for tall border varieties, medium border varieties and bedding varieties are 90cm, 60cm and 30-45cm respectively.

Hybrids which have been cultivated in great numbers are of uncertain lineage, but probably they are derived from the crossings between several species and varieties mostly consisting of the *Dahlia variabilis*, *Dahlia coccinea*, *Dahlia crocea*, *Dahlia imperialis*, *Dahlia juarezii* and *Dahlia merckii*. Today the skill of breeders has produced a range of sizes and colours unmatched in the world of garden flowers. Plants ranging from dwarf bedders 30cm high to giants taller than a man—blooms varying in size from a coin to the large dinner plate. In general, some catalogues use words to describe the average height of a variety grown under good conditions :

The border variety	More than 120cm
Medium border variety	90cm-120cm
Small border variety	Less than 90cm
Bedding variety	Less than 60cm
Liliput variety	30cm or less

Apart from above hybrids from several species, hybrid seeds from *Dahlia pinnata* bears single and double flowers, 5-7.5cm across in several enchanting colours and double spiky petals. The colours are orange, red, violet, white, yellow and the crop time is 13-14 weeks.

DAY LILY

FAMILY : LILIACEAE

The name 'Day lily' is correctly applied to this group of plants because the flowers borne in succession each lasts for only a day. Modern hybrids are available in a vast range of colours from palest yellow to richest red, the lily-like trumpets measuring upto 18cm across both 50cm dwarfs and 130cm giants are cultivated. Any reasonable garden soil with sufficient moisture will help it grow. It thrives best in sun or light shade. It looks elegant when grown in the background of a herbaceous border, in the front line of shrubbery and along the sides of ponds. The clumps are divided and planted when over-crowded in March both in cool plains and in hills. It originated in Europe and Asia. It can withstand temperatures down to -15°C .

In general, *Hemerocallis* hybrids are 90cm tall and are spaced 60cm apart. The flowering period is April to August. These hybrids are the result of crosses between *Hemerocallis fulva* (yellow-orange), *Hemerocallis lilio-asphodelus* (delicate-lemon) and *Hemerocallis minor* (lemon yellow). The colours are pure pink, yellow-eyed red, yellow-eyed dark red, orange, yellow and scores of other shades. New buds appear continually during the flowering season. The cultivars raised from seeds do not come true. In *Hemerocallis citrina*, many large and fragrant trumpet shaped, rich lemon yellow flowers lasting for a day are produced.

DESERT CANDLE

FAMILY : LILIACEAE

Other common names : Foxtail lily, King's spear

Desert candle is a well-known plant grown for its shallowly cup-shaped flowers in the hills in summer and its colourful and massive upright spikes rising well above head height. Its origin is Central Asia including Himalayas. They are the plants whose attraction lies mainly in their pink, red brown, orange, yellow, buff, white flowers borne freely on 125-

200cm high plants. The number of stems are 1-3 and the foliage colour is green-grey.

Desert candle needs full sunlight and well-drained soil with sufficient organic matter. It perennializes easily in areas where minimum temperature comes down in the range of -12°C to -28°C and so it is suitable only in high hills. The planting time is fall and the crowns are covered with 5cm of soil spaced 30cm apart.



Eremurus hybrid



Tuberous root of Eremurus hybrid

Eremurus robustus produces huge racemes of cup-shaped pink flowers. In *Eremurus* hybrids, the multiflowered spike is 30-60cm long and bears 100-300 flowers numbers in pink, red-brown, orange, yellow and creamy white colours. For fresh use they are cut when 25 per cent of florets have coloured. The cut flowers can be stored safely in water at 2-5°C. Hybrids of *Eremurus robustus*, *Eremurus himalaicus* and *Eremurus stenophyllus* appear in shops in flower colours ranging from sulphur yellow, golden yellow, brownish-orange, lilac pink, to pure white and many more.

DOG'S TOOTH

FAMILY : LILIACEAE

Other common name : Violet

Dog's tooth is an excellent plant for the rockery or around the base of the trees. It requires partial shade and so it is not a sun lover. The nodding star shaped flowers are borne above the attractively mottled leaves. Its common name comes from the shape of the tubers and not the foliage. It is spring flowering in hills and the blooms are in pale to deep pink, bright yellow, rose, pale purple, white and many more colours. It prefers cool climates and can withstand temperatures down to -5°C to -15°C .

It thrives best in humus rich and well-drained soil where the tubers do not become too hot and dry in summer. The planting time is from August to October in hills. The offsets are placed at a depth of 10cm and 10cm apart. It can also be propagated by seeds in autumn. The offsets are removed and replanted immediately in late summer. Erythronium tubers are never allowed to dry out.

There are several species in cultivation. Some of the popular ones are : (1) In *Erythronium grandiflorum* the stem carries 1-3 pendent, bright yellow flowers with reflexed petals on 10-30cm high plants. The spread of the plant is 5-8cm. (2) *Erythronium oregonum* has two semi-erect mottled basal leaves and upto 3 pendent white flowers with yellow eyes and often brown rings near the centre. The petals reflex as flower opens on upto 35cm high plants. (3) Another usual garden type is *Erythronium dens-canis*. The rose coloured flowers measure about 5cm across and the leaves are mottled with brown markings. (4) The aristocrat is *Erythronium revolutum*. It produces a loose spike of 1-4 pendent, pale to deep pink flowers with reflexed petals on 20-30cm high plants (5) *Erythronium* 'White Beauty' has mottled foliage and a loose spike of 1-10 pendent, reflexed white flowers, each with a brown ring near the centre.

FOOTBALL LILY FAMILY: AMARYLLIDACEAE

Other common names : Blood flower, Red cape lily.

Typical characteristics of Football lily are the large, scarlet ball shaped or puff like heads of small star shaped flowers. These dense heads are produced on 30cm long stout stems. It is frost tender and tolerates a minimum temperature of



Haemanthus (Football lily)

10°C–15°C with ease. The origin of this plant is tropical Africa.

This is a very hardy plant which can remain in one place for many years and still produce a beautiful display. So it should be left undisturbed till new stock for planting is needed. It is an ideal subject for rockeries, pots, beds, top of garden walls and as a frontline plant in a herbaceous border. It prefers a well-drained soil and full sun or partial shade. It is propagated by offsets or seeds. The offsets are planted in spring in cool plains 40cm apart.

Haemanthus multiflorus (*Haemanthus kalbreyeri*, *Scadoxus multiflorus*) is a species which grows profusely. Spherical umbel is 10-15cm wide bearing upto 200 narrow petalled flowers on upto 70cm high plant.

The other popular species is *Haemanthus coccineus* (blood lily). It has two elliptic leaves, hairy beneath, that lie flat on the ground. Spotted stem 30cm high forming before the leaves bear a cluster of tiny red flowers with prominent stamens. With fleshy red or pink bracts. *Haemanthus albiflos*, white flowered can be grown in the same pot for several years. It is never more than 30cm or so in height. *Haemanthus Katherinae* produces huge orange-scarlet inflorescences in summer.

FREESIA

FAMILY : IRIDACEAE

The florist's Freesia originating from south Africa are well-known cut flowers for indoor decoration and offers a bright display of richly fragrant blooms in various shades of yellow, white, cream, orange, pink, red, mauve, bronze, blue, primrose yellow with orange shading, sky blue and white throat, deep orange, yellow, cyclamen-purple, cherry-pink with white throat, deep golden yellow and several more. The flower raceme should be cut when the first flower on it has opened. After cutting, the raceme is placed in water

and other blooms also start opening. The funnel shaped flowers are borne on one side of wiry stem. Modern large flowered Freesia hybrids are known for round the year culture, high production, straight and heavy stems, excellent bud presentation, upright leaves, short plants, long crests and very good keeping quality of blooms.



Freesia

Freesia grows well in light, well drained soil and in full sun. It is suitable for growing in beds, pots and shallow containers. About 6-8 corms can be planted 2.5cm deep in 20cm pot. The pot should be kept in shade and irrigated sparingly until the growth has commenced when more water can be applied. The planting is done in October in cool plains and during August-November in the hills. Usually the plants come to flowering within 12 weeks from the date of corm planting. The flowering is in February–March in cool plains. In the hills, successive planting of corms can be done and the flowering lasts for about six weeks. *Freesia* can be grown by seed but the named cultivars are raised by corms only. *Freesia* can withstand temperature down to 0°C only.

The modern hybrids are the results of crosses between *Freesia armstrongii*, *Freesia alba* (*Freesia lactea*, *Freesia refracta*) and others. The prepared corms of *Freesia hybrida* are purchased. *Freesia alba* bears loose spikes of very fragrant, white flowers each 5-8cm long on 20-30cm high plants. In *Freesia armstrongii* the flower stem bends horizontally near the top and bears a spike of unscented upright pink flowers, 3–3.5cm long with yellow base on upto 30cm high plants. The plant spread is 4–6cm.

GARLAND FLOWER

**FAMILY :
ZINGIBERACEÆ**

Other Common name : Ginger lily

Garland flower is a well-known bulbous plant which is loved for its fragrant, spectacular flowers. Of course, the individual blooms are short-lived but borne profusely. It is ideal for sheltered borders and conservatories when grown in clumps. The origin of the plant is South-east Asia. It flourishes well in areas where minimum temperature comes down to

around 5°C. Depending on the kind of species, of course, it can be frost tender to frost hardy. It needs sun and rich moist soil. It is mainly propagated by division in spring in hills and in October in cool plains. The rhizomes are not divided when dormant.

Some species are popularly grown : (1) *Hedychium densiflorum* bears a profusion of short lived fragrant orange and yellow flowers in dense spikes during summer in hills on 120-180cm high plants. The spread of the plant is 60cm (2) *Hedychium coronarium* (white ginger lily) is frost tender and produces dense spikes of very sweet scented butterfly like white blossom with basal yellow blotches. It flowers in mid-summer in the hills. It is best suited for lower elevations.

GAY FEATHER

FAMILY : COMPOSITÆ

Other common names : Blazing star, Snake root

This is a summer flowering plant coming from temperate regions and is useful as a cut flower and garden plant. It bears the erect spikes, densely clothed with small flowers coloured pink or pale purple. The blooms open from top downwards. The grass-like dark green leaves form basal tufts. It prefers sun and well-drained soil. It requires water when the weather is dry. The spikes are removed when the flowers have faded. It is a peculiar plant where all traces of the clump disappear in winter. The emergence of foliage can only mark the presence of gay feather in the soil during spring only.

Liatris callilepsis (*Liatris spicata*) is the species that is mostly grown in the border and pots. The spike carries up to 25 florets, blue in colour on a 100cm high plant. The corms, 6-10cm in diameter are placed 13cm deep and 8-10cm apart in fall or spring in hills. This species originated



Liatris callilepsis

in North America and thrives well in areas where minimum temperature even comes down to -15°C . *Liatris scariosa* produces pure white flowers in mid summer in hills and is 90-150cm high. It is an easy, long lasting cut flower.

GLORY LILY

FAMILY : LILIACEÆ

Glory lily, a native of India, is a flower which excels in the brilliance of its colour and it keeps changing the colour as it matures. In summer, the upper leaf axil carry most exquisite blooms which are primrose-yellow on opening, changing to dark red or orange red each in 6 sharply reflexed, wavy-edged petals. The stamens protrude prominently from the flower. It is superb as a cut flower.

It is a frost tender plant and thrives well in areas where the minimum temperature comes down to 8°C to 9°C . It requires support for growing in pots and garden beds that are well-drained and are under sunny locations. Glory lily is

propagated by seeds and tubers by placing them horizontally in March–April in plains for flowering in July to September. In hills it is not comfortable because it feels helpless before frost. The species in cultivation are : (1) *Gloriosa superba* 'Rothschildiana' bears large flowers that have 6 reflexed red petals with crinkled edges, yellow margin on upto 180cms long plants *Gloriosa superba* is most popular and it is a climbing plant with tendrils which help it to climb on a trellis or screen. (2) *Gloriosa carsonii* produces flowers that are dark chocolate or maroon and lemon yellow at the base (3) *Gloriosa magnifica* has deep rose-red violet shaded flowers (4) In *Gloriosa plantii*, the flowers are salmon-orange and lemon yellow.

GLOXINIA

FAMILY : GESNERIACEAE

Gloxinia is a handsome plant with bright coloured large, open bell-shaped blossoms in profusion well above the thick velvety green foliage. The flowers are in many colours, i.e., bright red, bright scarlet, violet, white, purple, blue, pink, blue or scarlet with a white border. In some garden varieties, the blooms have white throats and in some the petals are frilled, ruffled or fringed. Double flowered cultivars are also grown. Hybrids with big sized blooms on short and stout stems are also cultivated. Gloxinia is extremely graceful when grown in pots and portico. It is frost tender and grows well in locations where winter temperature comes down to 15°C. Its home is Brazil. It grows well in bright light but not direct sun. It prefers a humid environment, moist but not waterlogged soil. The tubers are allowed to dry out when the leaves have died down after flowering. The tubers are stored in a cool, dry place. It can also be propagated by seed and leaf cuttings. The seeds provide 100 per cent double flowers in red, dark blue, blue and white, red and white shade. It is more convenient to use tubers. The tubers are planted in cool plains during February–March or June–

July. In the hills, they are planted during February–March to obtain flowering in summer.

Sinningia speciosa (*Gloxinia speciosa*) is the most popular species. It is short stemmed and bears nodding, funnel-shaped, fleshy, violet-red or white flowers to 5cm long and pouched on lower sides. This species is a parent of several named hybrids.

GRAPE HYACINTH

FAMILY : LILIACEAE

Grape hyacinth is a bulbous flowering plant of a unique appearance and beauty. The flowers and their structure are most interesting-leafless flower stems bear dense spikes of small flowers, most of which have constricted mouth. The spike of blue flowers resembles a grape bunch and carries a musky fragrance. It is an elegant choice for use in miniature indoor arrangements. The grape hyacinth in clumps is suitable for growing in pots, rockeries and borders. It needs a sunny position and fairly well-drained soil. It is fully to half hardy and can, thus grow well in areas where minimum temperature comes in the range of 0°C to –15°C. The origin of Grape hyacinth is Southern Europe.

It is propagated by division or seeds in October on the plains and hills as well. The bulbs are planted 8cm deep and 10cm apart. They flower during February–March both in plains and hills. It does not like disturbances and hence, the bulbs are taken out only when needed after several years.

The most popular choice is *Muscari armeniacum*. It is a spring flowering bulb with 3-6, long, narrow, semi-erect basal leaves. It bears a dense spike of small, fragrant bell-shaped deep blue flowers where the mouth is constricted and have a rim of small, paler blue or white teeth. The height of the plant is 15-25cm and the spread is 9-12cm. Another popularly cultivated species is *Muscari botryoides*.



Muscari

It has bright blue flowers, each with a constricted mouth and white toothed rim. The height of the plant is 15-25cm and the spread is 5-12cm. This species has also a white flowered variety. *Muscari macrocarpum* bears a dense spike of fragrant, brown-rimmed, bright yellow flowers. The upper blossoms are initially, brownish-purple. The height of the plant is 15-20cm and the spread is 10-16cm.

HIPPEASTRUM

FAMILY :
AMARYLLIADACEÆ

Hippeastrums deserve one of the highest honours for their beautiful large funnel shaped blossoms of white, blood red and crimson colours appearing during the summer months. The multiflowered umbel useful for fresh use has 2-6 flower



Hippeastrum (Amaryllis)

number, 13cm in diameter on usually 25-30cm high plant. The modern hybrids have dazzling colours including beautiful stripping and mottling. Though some Hippeastrums can withstand temperatures down to -5°C but mainly they are frost tender and grow well in locations where the minimum temperature remains around $13-15^{\circ}\text{C}$. Their origin is South



Bulb of Hippeastrum (Rhodophiala) advenum

America. Hippeastrums are grown best in beds, borders, pots and as edging plants.

They require full sun or partial shade and well-drained soil. The seeds of good strains generally breed true to type.



Bulb of Hiperkellia

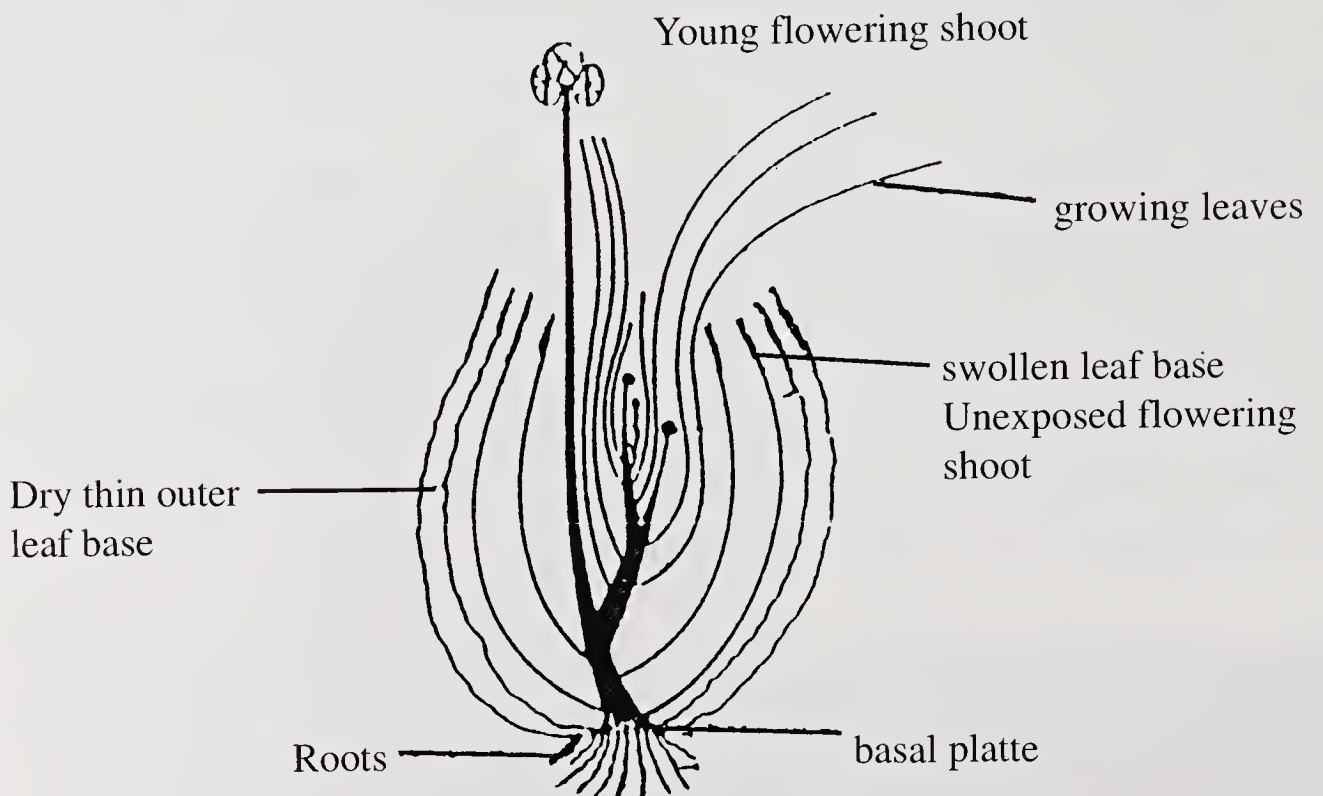
The offsets should be removed only when it can be taken out easily. The bulbs are planted 13cm deep to the base of the bulb and 30cm apart during September–October or preferably during December–January in plains when they are dormant. In the hills large flowered hybrids are planted in the autumn, half burying bulb after leaves die away. Smaller summer flowering species are planted in spring. The plants flower during March–April in cool plains and in the winter or summer in the hills depending on the kind of garden varieties and time of planting. Once planted, these bulbs continue to flower for several years. Hippeastrum goes to dormancy in winter in cool areas.



Hyperkelia

Hippeastrums are incorrectly cultivated as Amaryllis. In *Hippeastrum* (*Rhodophiala*) *advenum*, leafless stem carries a head of 2-8 narrowly funnel shaped red flowers, 5cm long on upto 40cm high plants. The spread of the plant is 15-25cm. *Hiperkelia* is a hybrid between *Hippeastrum vittatum* × *Sprekelia formosissima* and it produces 1-2 red flowers, 12.5cm in diameter on upto

50 cm high plants. The number of stems are 2-3 in the hybrid. It easily thrives in the minimum temperatures ranging



Hippeastrum bulb : its parts

from -6°C to 8°C . *Hippeastrum rutilum* var. *fulgidum* comes from tropical America. This is one of the species from which the varieties have been developed and is smaller and more graceful.

HYACINTH

FAMILY : LILIACEÆ

It is unanimously accepted as most elegant and pre-eminent indoor pot plants. It originated in Palestine, Syria, Lebanon, Turkey and Asia minor. It thrives well in areas where winter temperatures go down to even -5°C . Most gardeners begin their pursuit of bulbous flower growing by potting Hyacinth in their gardens. Leafless flower stalk with tubular blossoms fills the room with their sweet fragrance. Hyacinths are excellent flowers for beds and a special class of glass-vases called hyacinth glasses with lot of excellence—neat and compact growth habit, a long and steady flowering period,

very wide range of brilliant shades and a sweet fragrance. The hyacinth has a weak point and it is the high cost of named bulbs with respect to other important bulbs namely Tulips, Daffodils and Crocuses. It is generally wiser to lift the bulbs after flowering and dying of leaves. The bulbs are stored in dry peat in a cool space till the next planting season. In order to get success in Hyacinth growing, choose



Hyacinthus orientalis

medium sized bulbs for outdoor cultivation and add well-rotten compost or leaf manure. The bigger bulbs are used for pots. Any reasonable garden soil adequately supplied with humus is quite satisfactory for their growth. Hyacinth thrives better in cool environment of hills. But they flower exceedingly well in cool plains when grown from imported bulbs or from offsets procured from hills. The bulbs are planted 15cm deep and 20cm apart in cool plains in October for flowering in February–March. In the hills, the bulbs are planted in February for getting flowers in April–May. Before planting, the bulbs are kept in a cool, dark room or placed in soil or peat in the hills for about 10-12 weeks till the shoots grow to a height of 60-90cm after sprouting. For multiplication of bulbs, the mature bulbs are cut across at the base to a depth of about 1.5cm before planting. Small bulbs are formed near the mother bulbs when placed in soil during September–October. The spikes are removed from the mother bulb on its first emergence. This encourages small bulb formation. Small bulblets may flower in three years.

Hyacinthus orientalis is the most popular Dutch common Hyacinth. The flower stem carries a dense cylindrical spike of fragrant, tubular flowers in each numerous brilliant colours, each with 6 recurving petals. Modern Hyacinths with strong and dense raceme with 30-50 bell-shaped florets have been obtained by selective breeding with wild species and common varieties. The colour range in these hybrids is huge-ranging from white, deep red, pink, light blue, cream yellow, orange, violet, mauve, dark blue to many more. There is also a Roman Hyacinth—*Hyacinthus orientalis albulus*. The flowers of Roman Hyacinth are much less tightly packed and appear earlier than the blossoms of Dutch Hyacinth. There are white, pink and purple garden varieties, all recorded for their intense fragrance.

INDIAN SHOT

FAMILY : CANNACEAE

Other common name : Canna

The flowering spike of Indian shot appears like a colourful gladiolus without any of its popularity. The striking flowers may be large, 13cm across in yellow, pink, red or white colours. This plant could have certainly find a place in all bulb catalogues but for its main disadvantage, it is frost tender. It likes a sunny location and rich soil. The rhizomes are planted 7-10cm deep at 30-45cm spacing interval. The first flower may appear 60 days after planting. The cannas are replanted every year in June–July in plains and in early spring in hills. The rhizomes are lifted in May in plains with some portion of the stem attached.

Decorative *Canna indica* is very important and popular species, 150-200cm high and bears yellow and red flowers.

*Canna rhizome*

Many named *Canna indica* hybrids are popularly cultivated. They are divided into 2 groups—the green leafed varieties and the coloured leafed varieties. Canna leaves are quite big and handsome—select one of the coloured leafed variety. It may be pink or red flower and purple or bronze foliage. They are



Indian shot flower

used as dot plants in bedding schemes. Other modern hybrids—orchid flowering and truss flowering are crosses from different species and are 45-180cm high. The flower colour varies from white to dark cream, yellow, orange, scarlet and several shades of these colours. *Canna x generalis* produces bright blooms 7.5 to 10cm across, held above the foliage. The crop time is 100-120 days when grown by seeds. It may take only 90 days from sowing to bloom of red and rose coloured varieties in warm areas.

IRIS

FAMILY : IRIDACEÆ

Other common name : Flag

The stately Irises originating in South-East Asia, Southern Europe and Himalayas are valuable for cut flowers which can grow to a height of 100cm or more to tiny Alpine specimens peeping above the soil. The rhizome group is taller as compared to the bulb ones which is smaller. All Irises delight the gardener and the flower arranger. Most varieties cultivated in the gardens are hybrids of various types, the pure species are not so commonly grown. The new varieties are more particular than the old one for their requirements. They need a deep nourishing, well-drained soil, a sunny and cool position or light, half-shade. They suffer from damp rot in heavy soil or in excessively rainy seasons. The plants are raised from rhizomes/bulbs usually in October both in plains and in the hills. In the plains, they flower during February–March and the flowering takes place during March–April in the hills. Irises are cultivated for special colourful flowers. Each flower has usually 3 large pendent or semi-pendent petals which often may have clear beards or crests : 3 generally smaller, erect, horizontal or at times pendent petals and a 3-branched style. In some Irises, the style branches are petal like. Generally the flower stems are unbranched. Irises in general are fully hardy unless otherwise stated in bulbous flower catalogues. Irises may thrive only in specific growing environment. Named cultivars are propagated by divisions of rhizomes or offsets (youngest segments) in late summer in hills. Seeds can be used in autumn in hills. Classification of Irises is complex, but getting a working knowledge of main groups is not difficult. Irises are divided into several classes. Some of which are mentioned below.

Bearded Irises are rhizomatous and have beards. Beards indicate numerous often coloured hairs, along the centre of

*Freesia*

each large petal. This group is derived from *I. pallida* and related species. Bearded Irises thrive in a rich, well-drained, slightly alkaline soil in a sunny site. Hybrid bearded Irises are grouped on the basis of mainly height of plant, i.e., miniature dwarf (20cm), standard dwarf (20-40cm), intermediate (40-70cm) and standard tall (70cm or more).

Beardless Irises, also rhizomatous but do not have hairs on the large petals. *Crested* Irises, also rhizomatous but displays ridges or cockscomb-like crests instead of beards. *Bulbous* Irises are distinguished by having bulbs, sometimes with thickened fleshy roots. *Juno* Irises have bulbs with thickened fleshy roots. *Reticulata* Irises include dwarf bulbous Irises valuable for flowering early in the year. Bulbs in this class have net like bulb tunics.

Iris hollandica—Dutch beardless Iris produces blue,

bronze, yellow, or white bicoloured flowers, 7.5–10cm in diameter on up to 60cm high plant. It perennializes in climatic zones where winter temperatures touches -1°C to 4°C . *Iris oncocyclus* (Lady in mourning) produces bearded bronze, yellow and lavender flowers, 15cm in diameter on 40-60cm high plants. It easily perennializes in areas where minimum temperature touches 4°C to 8°C . *Iris hollandica*



Iris hollandica



Corm of Iris hollandica (Dutch Iris)

and *Iris oncocyclus* originated in Israel and can be planted in October in cool plains and in hills. The plants flower during February–March in cool plains and March–April in hills.

For fresh flower use, Iris flower is cut when the buds are opening. When the plants have grown thick for a number of years the rhizomes are divided and replanted. Iris corms are planted 13cm deep to its base at 5cm apart (I.



Rhizome of Iris oncocyclus

hollandica). The rhizomes are covered with 5cm of soil at 10cm apart. (*I. oncocyclus*).

Iris cristata is a rhizomatous, crested iris that produces virtually stemless long-tubed lilac, blue, lavender or white flowers, 3-4cm across with a white patch and a orange crest on each large petal. It prefers semi-shade and moist soil. *Iris magnifica* is a bulbous Iris that produces very pale lilac blooms, 6-8cm across with a central yellow area on each large petal. *Iris histriodes* produces solitary flowers, 6-7cm across in light to deep blue colour and is a bulbous reticulata type. *Iris winogradowii* is another bulbous reticulata type that produces solitary pale prim-rose flower, 6-7cm across on 6-10cm high plant.

JACOBEAN LILY FAMILY : AMARYLLIDACEAE

Other common names : Aztec lily, St. James lily

This is a plant coming from Guatemala and Mexico region and bears showy red blossoms in spring. It needs an open, sunny situation and humus rich well-drained soil. The plant is kept dry in winter and growth is initiated by irrigation in hills. It thrives well in areas of cool plains where minimum temperature in winter remains less than 8°C even upto 1°C. The bulbs of 15cm in circumference are planted in late winter to early spring in hills by placing the nose of the bulb at soil level and 20cm apart. In cool plains, they are planted in February–March in highly manured and moist soil. It flowers in summer and rainy season in cool plains and in spring to summer in hills.

Sprekelia formosissima is the only species in cultivation. The stem bears a deep red flower individually on 2-3 stems on a 30-35cm high plant. The blossoms are 15cm wide and has 6 narrow petals with green striped bases. The spread of the plant is 13-15cm.

KAFIR LILY FAMILY : AMARYLLIDACEAE

This is a plant coming from South Africa. It is strong and evergreen; grown for its funnel shaped flowers in summer. It is frost tender, but grows well in areas where minimum temperature comes down to 10°C. It looks most beautiful when grown in beds and containers. The height of the plant varies from 30-40cm.

The bulbs are planted 5cm deep, 50-60cm apart in February–March in hills and cool plains. It needs partial shade and well-drained soil and requires enough water during growing season. It can be propagated by seeds in

winter or spring. The plant should not be disturbed for several years.

The garden species mainly cultivated is *Clivia miniata* and it produces a head of 10-20 orange or red flowers on each stem in spring or summer. Another popular species is *Clivia nobilis*. Each leafless stem bears a dense, semi-pendent head of over 20 narrowly funnel-shaped, red flowers with green tips and yellow margins to petals.

LEOPARD FLOWER

FAMILY : IRIDACEAE

Other common names : Blackberry lily

These are handsome plants originating from China, grown for their Iris-like flowers. They carry a fan of sword shaped semi-erect leaves and comprise many shades—orange, purple, rose, yellow, bicolor, flowers which stand out beautifully in pots and beds. The attractive spotted flowers are produced in loose heads but do not stay long.

They grow best in a deep, humus rich soil in sun or under partial shade. They are propagated by seeds and rhizomes and the planting is done during February–March in the plains and October–November in the hills. The rhizomes are placed with only 3cm of soil over them at 15-20cms apart. They do not suit well in very cold areas. In warm plains, they can be planted in shade. The plants are kept moist during growing season.

Belamcanda chinensis is cultivated most frequently. The plant is 45-100cm high and bears a succession of flattish, orange-red flowers, 4-5cm across with darker blotches. The attractive seed clusters are shiny and black. The second species *Belamcanda flabellata* differs from *Belamcanda chinensis* only in colour and height. The colour is clear yellow spotted with orange. The height is

generally under 60cm. Dwarf orange and yellow forms, 40-50cm high are also quite popular.

LIGULARIA

FAMILY : COMPOSITÆ

These are handsome plants with large bold leaves. They form big bushy growths which stand out beautifully on the



Lilium

banks of ponds or streams and equally in half-shaded damp parts of the gardens, in front of dark conifers or planted simply as solitary groups on the lawn. But do not grow *ligularia* unless it is moisture retentive soil and a large space to fill apart from availability of some shade overhead. They produce several upright stalks with clusters of yellow or orange flowers at the end of summer in hills and can withstand temperatures down to 0°C to -15°C. They grow best in a deep humus rich soil with sufficient moisture and can be planted in damp places near water, ponds, and streams where they fit beautifully with other damp and shade loving plants. All species grow well in the sun provided they have enough moisture.

They are propagated by division of clumps in spring although the parent plant should not be too old. The plants will last for several years in one location if looked after well. The planting distance is 80-100cm.

Ligularia clivorum (*Ligularia dentata*) is cultivated most frequently. The plant is about 100cm high with large heart-shaped leaves. The blossoms are relatively large, 8cm in diameter, golden yellow on strong branched stalks. There are several decorative varieties with large multi-coloured blossoms and purple to red-brown heart shaped leaves. The light golden yellow blossoms in a dense, long cluster are more delicate. It flowers from September to October in hills. The small, yellow blossoms of *Ligularia przewalskii* are borne on erect spikes. *Ligularias* may also be listed under 'Senecio' in the catalogues.

LILIUM

FAMILY : LILIACEAE

Lilium is a plant of ancient lineage grown for its often fragrant and brightly coloured flowers. It originated in China, Japan, Korea, California (USA) and some other regions. Lilies can withstand winter temperature down to



Lilium candidum

5°C though known otherwise. The colour range of Lily spans the whole floral spectrum with the exception of blue and the large variations in plant height makes the modern *Lilium* a suitable plant for many areas of the garden. Dwarfs as the 30cm *Lilium pumilum* are just elegant in the rock garden. The 240cm giants like *Lilium henryi* belong to the back of the border. Between these two extremes are the vast majority of *Liliums* 90cm-180cm high and at their best

in the herbaceous borders. Liliium enthusiasts often grow them in beds and pots by selecting suitable species and varieties. There are flowers to be seen and admired from May to October in hills: In cool plains, February and March are the months when Lily flowers are at their best in gardens.

The majority of the ordinary gardeners with no special



Bulb of Lilium longiflorum

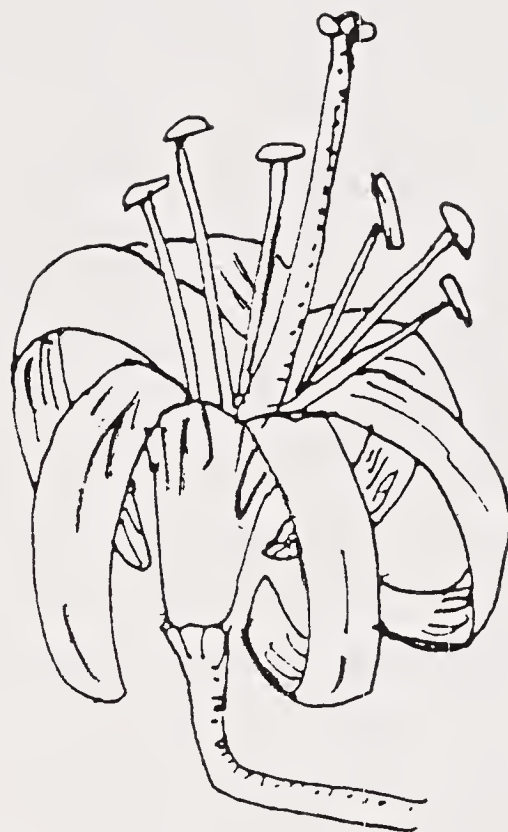
FLOWER FORMS IN LILIUM

*Bowl shaped*

affection for the *Lilium* consider it as a difficult plant and abandon its adoption. It is not expected to obtain abundant blooms in the first year and the plants may rot if the soil is not well-drained. The fleshy bulbs must be planted as soon as they have been obtained. Before planting Lily bulbs a little sand should be placed at the bottom and no fresh manure should come in contact with the bulbs. It is now quite easy to grow *Liliums*. During the past century, a number of hardy and tolerant species have been discovered. Particularly, in the past 50 years the hybrid *Liliums* like Oriental, Asiatic, Longiflorum hybrids have set new specifications in flower size, vigour and disease resistance. Lily flowers vary from 2.5cm to 30cm in diameter with a fragrance range from delightful to disagreeable. In northern plains, the *Liliums* may be planted in September–October. In the hills, the early summer blooming *Liliums* are grown during the autumn and



Trumpet Shaped



Turk's cap shaped

those flowering in July–August are planted in early spring. The bulbs need 15cm of soil on top of them. Unnecessary disturbance, may delay flowering and quality of flowers.

Liliums are propagated from seeds, bulbs, scales, bulblets and bulbils. Seedlings may take 5-6 years to flower but named varieties do not come true to type by seeds. A well-drained site is essential. It is impossible to generalise about the lime content—many species, such as *Lilium auratum* and *Lilium pardalinum* will not relish if lime is present while a few others such as *Lilium candidum* need an alkaline soil. Lilium hybrids are quite tolerant and are not worried either way. Most Lilies relish a sunny site but a little shade during the day is not a problem. The lower parts of the plant should be shaded with the help of surrounding shrubs or low growing plants. A sheltered location rather than exposed one should be chosen. Liliums must not be allowed to dry out. It should be thoroughly and regularly

irrigated during dry seasons. Staking may be necessary if the *Lilium* plant is more than 90cm high. Nip off the faded flowers before the seeds are formed. At the end of the flowering, allow the stem to die down and then cut off at ground level.

In *Liliums*, the flowers, usually several per stem, are mainly trumpet to bowl shaped or with 6 petals strongly reflexed to form a Turk's cap shape. Each plant has a spread of 30cm. These beautiful plants have three flower forms: (i) Bowl shaped—the petals flare open to produce a wide bowl. The flowers are usually large. Example : *Lilium auzatum* (Golden-rayed lily)—flowers white with yellow stripes, brown spots; *Lilium Parkmanni* hybrids—flowers in various colours (ii) Trumpet shaped—the petals are grouped together for a part of the length of the flower to produce a basal tube. Example *Lilium longiflorum* (Easter lily)—flowers white, fragrant, *Lilium regale* (Regal Lily)—flowers white with yellow throat; *Lilium candidum* (Madonna lily)—flowers pure white, fragrant (iii) Turk's cap shaped—the petals are rolled and swept back. The flowers are usually small. Examples *Lilium amabile*—flowers red with black spots; *Lilium hansonii* (Golden Turk's cap)—flowers yellow with brown spots.

LILY OF THE VALLEY

FAMILY : LILIACEÆ

The view and sweet smell of these white and pink blossoms originating from Asia and Europe have provided tremendous joy to the poets and garden lovers since many centuries. The flowers are small, bell shaped and highly fragrant. They are borne in sprays of 10-20 on 15-20cm long stalk during May-June in hills and in February-March in cool plains. In marriages, it is popularly used in bridal bunches of flowers which are 0.6cm across. In the garden it is often planted in shade under the tall trees and is excellent as a cut flower.

Being fully hardy, it prefers the climate of hills as compared to cool plains but can be grown with care in humus-rich and moist soil. The creeping rootstock is planted horizontally about 3cm deep at an interval of 10cm with the pips (upright shoots) a little above the soil surface in September–October both in hills and plains. The clumps are divided and replanted immediately. There is just one species—*Convallaria majalis* that is low growing and fully hardy. The flowers are pendent and double. The height of the plant is 25-30cm and the spread is indefinite. The plant spreads by means of underground branching rhizomes. Varieties are available with golden-striped leaves.

LOTUS

FAMILY : NELUMBONACEAE

Most of the Indians bestow on sacred Lotus flower the highest honours and look at it with reverence. It is a native of India and some garden variations can withstand winter temperatures down to 0°C. However, it thrives well in general when winter temperatures are in the range of 1°–7°C. It is a marginal water plant grown for its foliage, flowers and seeds. It needs an open sunny location and 70cm depth of water. The fading foliage is removed and the flowers are allowed to develop into decorative seed pods. It is propagated by divisions of rhizomes or tubers. The common method of raising them in a garden pool is first to place them in a pot that contains humus rich soil. Then the pot is placed on the bricks in the pond in such a manner that the crown of the plant is just above the surface of the water. It is lowered as soon as the new growth appears. The Lotus can also be grown by directly planting in the soil of the garden pool. The pond's bottom should have 10-15cm thick layers of well-decomposed manure and soil. Little water is added in the newly prepared pond. In few weeks, water is added slowly to fill the pond completely. In hills,



Amaryllis & Bulb of Amaryllis

this operation can be done in the spring. In cool plains, rainy season is ideal. The species can be propagated by seeds. The selected forms are multiplied by division.

Several species are under cultivation as under :

(1) *Nelumbo nucifera* (Sacred lotus) is a marginal water plant. The sturdy stems carry very large plate like blue green leaves and in summer, large, vivid rose pink flowers maturing to flesh pink. In a garden form the large fragrant chalice-shaped white flowers, 15cm across and edged with crimson are borne in summer. Two other garden forms bear pure white or double soft pink flowers. The height above water may be 1-1.5m. The spread of the plant may be 100-125cm. It grows well where winter temperatures remain

around 7°C. (2) In *Nelumbo lutea* (American lotus) the large chalice shaped blossoms are yellow appearing in summer.

ORNAMENTAL ONION

FAMILY : LILIACEÆ

The Ornamental onion because of their beauty of small flowers packed together in a dense spherical or shuttle cock-shaped umbel are a valuable inclusion in any garden. The flowers are rose, white, blue, lilac, purple, pink yellow or violet in colour and are ideal for fresh use. Nearly all have narrow basal leaves smelling of onions when crushed. The origin of this plant is temperate regions of northern hemisphere and so these species grow more successfully in hills. Alliums are fully to frost hardy. They thrive well where the winter temperatures go down to -5°C to -15°C .

The plants are very easy to grow and trouble free and grow in sunny location and in almost every garden soil as long as they are planted where they can roam at will. In these plants the planting depth is three times the height of the bulb at an interval of 8-10cm. They are easily propagated by division of clumps. The plants can remain in one place for several years without special care but it is a good idea to divide the clump and transplant the bulbs during October-November in hills after three or four years and so rejuvenate them. The plants flower from May to October depending upon the species. Most of the species bloom in May to June in hills and in March in cool plains. It is easily propagated by seed in autumn in hills.

Allium neapolitanum (*Allium cowanii*) is regarded as one of the finest of the species because of its lovely, elegant white blooms. This is called 'Onion of the Naples' and is the only good species for the pot culture. Other Ornamental onions are : (1) *Allium aflatunense* gives purple-lilac blooms and is excellent for cut flowers. (2) *Allium flavum* is fully



Allium sphaerocephalon

hardy and bears a loose umbel of up to 30 bell-shaped, yellow flowers, each 0.5cm long on thin arching stalk on 10-30cm high plants. (3) *Allium giganteum* produces a stout stem with a dense spherical umbel, 12cm across of 50 or more star-shaped purple flowers on 200cm high plants. (4) In *Allium karataviense*, the foliage is most attractive and the flowers are star-shaped, pale purplish-pink on umbel,

15cm across on 20cm high plants. (5) *Allium moly* is known as golden garlic because the flowers are bright yellow (6) *Allium murrayanum* bear purplish pink flowers.

OXALIS

FAMILY : OXALIDACEAE

Other common name : Wood sorrel

This popular bulbous plant is grown for its colourful flowers, the buds of which are rolled like an umbrella and for its often attractive leaves. The plant is extremely beautiful when it bears rosy-pink, yellow, bluish-violet, deep pink, white flowers in rockery, shrubbery, pot and hanging basket. The leaves are mostly less than 2cm and are divided into 3 or more leaflets. Some species may be invasive. Though the various species are fully hardy to frost tender, in general it thrives well in locations where minimum temperature remains around 5°C. Oxalis grows well in well-drained soil and full sun.

Oxalis is tuberous rooted species and can be propagated from bulbs. A few species can also be grown from seeds. The planting of bulbs or seeds is done in October in plains. On the hills, the bulbs are planted in September and the seeds are sown in March-April. Some of the species popularly cultivated are as under : (1) *Oxalis bowiei* (*Oxalis purpurata* var. *bowiei*) produce a loose head of 3-10 widely funnel shaped pinkish-purple flowers, 3-4cm across on upto 30cm high plants. It needs a sheltered and sunny site. This Mexican species can withstand minimum temperatures down to 0°C. (2) *Oxalis deppei* (*Oxalis tetraphylla*) is a Mexican weed. The leaves are brown-marked divided into four leaflets and it produces loose sprays of widely funnel-shaped deep pink flowers on 15-30cm high plants. The spread of the plant is 10-15cm. It needs a sheltered site. (3) *Oxalis lobata*—The leaves have upto 5 rounded lobes and

*Oxalis*

it bears racemes of widely funnel-shaped bright yellow blossoms, 1-2cm across on 5cm high plants. The spread of the plant is 8-12cm. (4) *Oxalis acetosella* f. *rosea* (Wood sorrel)—It forms mats of 3-lobed leaves and the plant bears cup-shaped soft pink flowers, 1cm across with 5 darker veined petals on 5cm high plants. The spread of the plant is indefinite.

PERUVIAN LILY

FAMILY :
ALSTROEMERIACEÆ

These mid summer flowering plants offer a wide spectrum of long and colourful flowers—pale lilac, reddish white, yellow with purple, pink, pure white etc. Some species have three bands of colour while some produce as many as 40-50 flowers in one head. The plant grows to a height of 30-

100cm. Its origin is Chile.

It can be grown in a wide range of soils. Though the plant is frost hardy it can withstand temperature down to -5°C . The plant needs good drainage and bright sun, but some shade is necessary in warm climates to maintain the colours of hybrids. Plant deep (20cm) leaving 30cm plant space. It can be left to itself for years except during replanting in case of overcrowding. As the roots, white and fleshy are brittle, care is needed in transplanting. It requires adequate moisture during growth.



Alstroemeria hybrida

One species, *A. haemantha*, provides edible flour when the roots are dried and crushed.

The species commonly grown are : (i) *Alstroemeria aurantiaca*—100cm high. Provides flowers profusely, often as many as 40-50 in one head. (ii) *A. ligtu*—wide colour range. Outer segment of flowers vary from pale to lilac to reddish white, inner petals usually yellow with purple. Var. *angustifolia* has narrower leaves with pink flowers, Var. *pulchra* has larger, more purplish flowers. *A. ligtu* is called St. Martin's flower. (iii) *A. pelegrina*—30-35cm high. Flowers longer than other species and extremely varied in colour, from rose to lilac to yellow. (iv) *A. pulchra*—(*A. tricolour*)—reaches 45cm high and flowers in summer. The plant has an elusive character of having three bands of colour.

PLANTAIN LILY

FAMILY : LILIACEAE

Other common name : Funkia

Until recently, this popular perennial originating in eastern Asia used to be known as *Funkia*. It has few flowers, its importance lies chiefly in its excellent leaves which are particularly long lasting when grown in half-shady and shady locations. It forms large clumps that look elegant for ground cover. They are suitable for groups, borders and for growing around pools. In some species, the leaves are green, in others variegated. The thin stalks carry a cluster of bell shaped, slightly pendent flowers with a long tubular perianth in white, lilac or purple or pale greyish mauve or mauve or pale violet or violet or milky-violet or lilac-purple colours and many more.

Most species prefer shade and rich moist and well-drained soil. It is fully hardy and can tolerate temperature down to—15°C. In hills it is propagated by division in early spring. The plants are perennial on hills but in cool plains, the plants flower during the rainy season. The species can even be grown from seed but the seed raised plants (with the exception

of *Hosta ventricosa*) rarely come true type. Decorative, large and small, blue and green leafed varieties, 30cm-75cm high are also popularly cultivated in Hosta by seeds.

There are numerous species under cultivation. Some of the commonly grown are :

- (1) *Hosta fortunei*—It is a vigorous hybrid perennial, 75-100cm high and leaves are oval to heart shaped, pale green or mid green with irregular creamy yellow edges and trumpet shaped violet or pale violet flowers.
- (2) *Hosta sieboldiana*—Produces large heart-shaped deeply ribbed, puckered leaves that are bluish grey. Racemes of trumpet shaped of pale lilac flowers open in early summer in hills just above leaves. It makes a beautiful ground cover.

SAFFRON

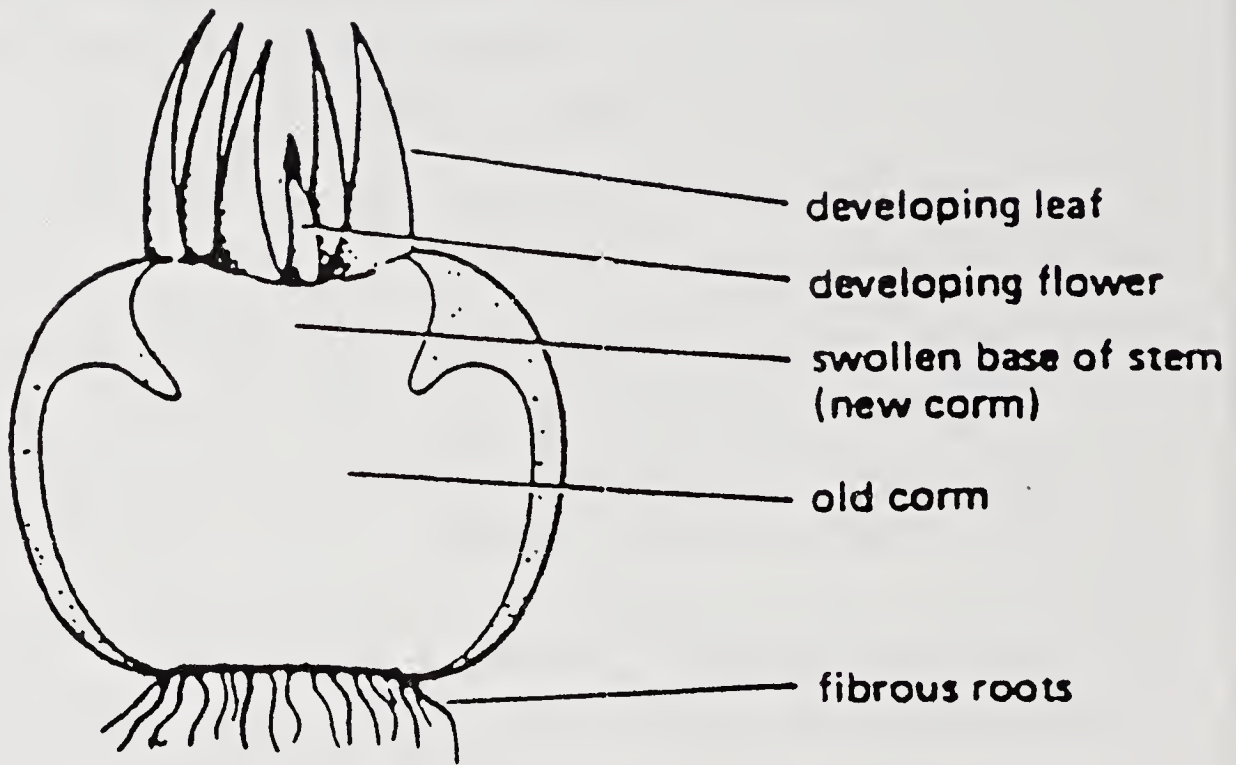
FAMILY : IRIDACEAE

Most of the gardeners have heard about Crocus but may not have grown it. Crocus grows well only in the hills. The choice is simple—a purple or violet-blue or yellow or white or pale silver lilac or a mixture. The wineglass shaped flower appear in many colours-bronze, white, pale blue, striped, bi-colored and blotched as well as the all too familiar purple and yellow. The leaves are narrow, semi-erect and basal and the flowers are funnel-shaped to rounded, long tubed. Some autumn flowering species have no leaves at flowering times. There are two other forms of Crocus-winter—flowering (December-February) and spring-flowering (March-April).

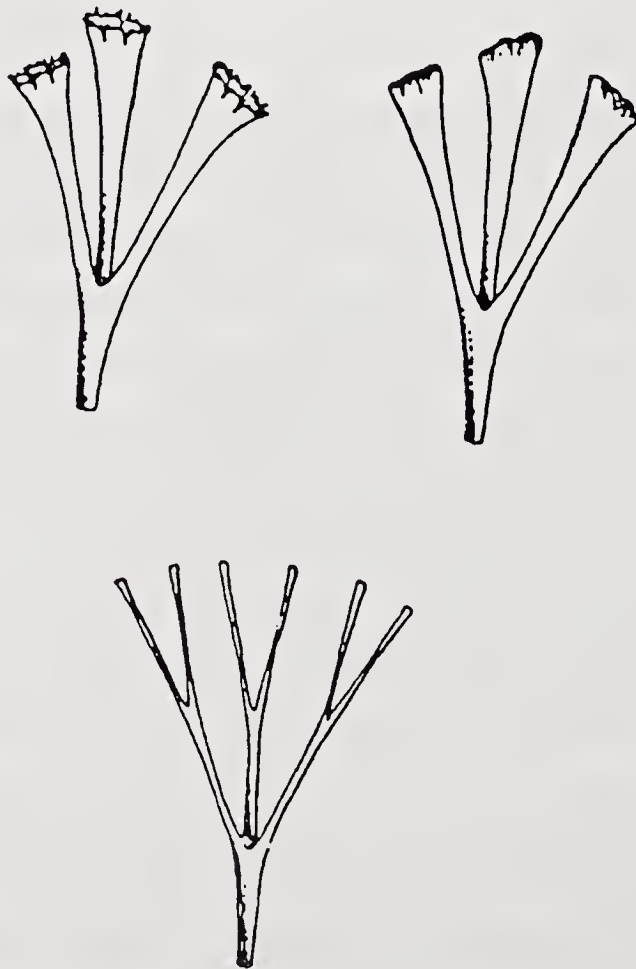
Most of the species are less than 10cm tall when in flowering and have a spread of 2.5–8cm.

Crocus is suitable for pots, beds and rock gardens.

The corms are planted about 5cm deep and 3cm apart. The autumn flowering group can be planted in



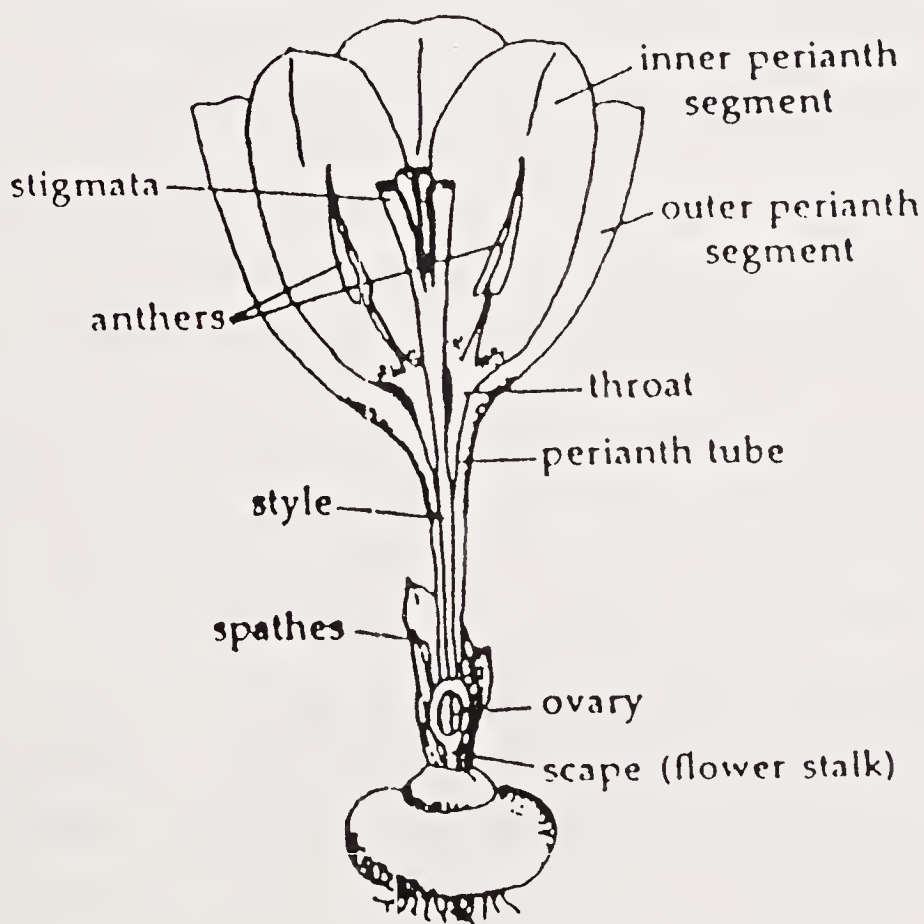
Crocus corm



Styles in Crocus

August-September. While the spring-flowering ones are planted in autumn (October-December). The plants thrive best in any well-drained soil in sun or light shade. It is propagated by seeds and by division of overcrowded clumps after 5-6 years. The corms are not lifted from the ground after flowering.

There are a number of species that are in cultivation. Some of them are as under : (1) *Crocus biflorus* subspecies *alexandri* is an early spring flowering corm. It is fully hardy and can withstand temperature down to -15°C . It carries fragrant, deep violet flowers with white insides. The other subspecies of *C. biflorus* is *pulchricolor* (*Crocus aerius*) and bears rich deep blue flowers with golden yellow centres. (2) *Crocus minimus* is late spring-flowering and bears 1 or 2 flowers, purple inside and stained darker violet or often darker striped on outside. It is 5-7cm high (3) *Crocus sativus* (*Crocus sativus* var. *cashmirianus* is called saffron crocus. It is autumn flowering, frost hardy and the



Crocus flower

leaves appear with saucer-shaped purple flowers, 5-7cm across that each have darker veining and 3 long bright red stigmas that yield saffron. (4) *Crocus chrysanthus* displays bright orange blooms feathered with bronze, and orange anthers. This species is the parent of many garden hybrids that are under 15cm in height. (5) *Crocus caspinus* has white to pale lilac flowers. The throat, anthers and style is yellow (6) *Crocus speciosa* and its hybrids are very popular. *C. speciosa* bears pale-purple blue flowers each with a network of darker veins and a much divided orange stigma. (7) *Crocus ancyrensis* is spring flowering corm and produces upto 7 fragrant bright orange yellow flowers.

SNAKE LILY

FAMILY : ARACEÆ

Other common names : Cobra lily, Green dragons

This well-known and popular plant with large, curiously hooded flowering spathe enclosing a pencil shaped spadix (spike-like flower cluster) blooms during rains, splashes of flowers that have paler green stripes edged with dark brown or white inside and yellow outside. *Arisaema* species originated mostly in Asia but some are of tropical African origin.

Arisaema prospers in humus-rich soil in full sun or partial shade. Tubers are planted in the spring for flowering in rains in hills at a depth of 9-12cm and 25-30cm apart. It is advisable to lift them only when parent stock is required. The plants emerge and die down in the same season becomes dormant when the winter sets in. Tropical species can grow in warm locations where the frost do not occur and can withstand temperatures down to 0°C to-15°C.

Arisaema candidissimum is one of the most well-known garden snake lily and bears large pink-striped, white spathes, enclosing tiny fragrant flowers on spadices on 10-15cm high plants.

SNOWDROP**FAMILY : AMARYLLIDACEÆ**

Snowdrop is one of the earliest bulbous plants to bloom in the gardening year that starts from January. Small, white, pendent flowers, one on each slender stem appear from January onwards clearly indicating that the spring is very soon on its way. Snowdrop is easily recognized by its three large outer petals and three inner ones forming a cup which is green marked. It is fully to frost hardy and, thus, withstand temperatures down to -5°C to -15°C . It needs a cool partially shaded position and humus rich moist soil. The planting time is September-October in hills at a depth of 10cm and 10cm apart. The mature clumps are divided immediately after flowering. The bulbs are replanted immediately. The bulbs can also be planted in late summer or autumn when they are dormant.

The most popular and common snowdrop is *Galanthus nivalis*. Its flowers are 2-2.5cm long with a green mark at the tip of each inner petal. The flowers are single or double on 10-15cm high plants. The spread of the plant is 6-8cm. There is other popular species *Galanthus elwesii*. In this species each inner petal of the white flowers bears green marks at the tip and base which may emerge on 10-30cm high plants.

SNOWFLAKE**FAMILY : AMARYLLIDACEÆ**

Snowflake is an attractive, pendent, bell-shaped, white or pink early spring bulbous flowering plant. It is often confused with snowdrop. In snowflake all the petals are of the same size and all bear a green spot at the tip. It is a plant which does not like disturbances. It grows well in areas where minimum temperatures remain in the range of -5°C to -15°C . Some species prefer a moist and partially shaded locations. Others do well in a sunny position and a well-drained soil. The bulbs of 12-16cm in diameter are placed 13cm deep and 5cm apart in fall. It is mostly used as flowering potted plant.

The most attractive and popular species is *Leucojum aestivum* (Summer snowflake). The multiflowered umbel carries 5-6 florets of white colour with green tip on 30-35cm high plant. The number of stems are two in this species. The origin of this species is Asia, Central and East Europe. It is grown in a well-drained soil and sunny spot. Another species, widely grown is *Leucojum vernalis* (Spring snowflake). In this species the leafless stem carries 1-2 pendent bell-shaped blossoms, 1.5-2cm long. The flowers have 6 green tipped white petals. The height of the plant is 12-18cm and the spread is 10-12cm.

SPIDER LILY

FAMILY : AMARYLLIDACEAE

Spider lily is the real jewel in the rainy season because of its fragrant flowers somewhat like those of large daffodils. The flowers are white or yellow-green and spider-like, with six long, delicate, narrow segments united at the base by a weak membranous cup. It looks spectacular when grown along the paths, near a pond and in pots. Some of the garden hybrids can withstand minimum temperature of around 0°C whereas some of them are frost tender. But it thrives well in areas where minimum temperature comes down to around 15°C. Its original home is South America. It needs a sheltered site, partial shade and well-drained soil. It is propagated by bulbs in September-October after the flowering is over in cool plains and in spring in hills. The bulbs are rested after flowering and are placed 5-8cm deep in soil.

Several popular garden hybrids are in cultivation :

- (1) *Hymenocallis × macrostephana* bears fragrant white or cream to greenish yellow flowers, 15-20cm wide on 90cm high plants. The spread of the plant is 30-50cm. It grows in areas where minimum temperature remains around 15°C.
- (2) *Hymenocallis littoralis* bears white fragrant flowers
- (3) *Hymenocallis* 'Sulphur Queen' produces a loose head of 2-5 fragrant yellow-green flowers, each 16-20cm wide with a cup and 6 spreading petals.

STAR OF BETHLEHEM

FAMILY : LILIACEAE

Star of Bethlehem is a striking plant and is a spectacular cut flower in deep silky orange, brilliant star shaped florets arranged in a compact corymb on strong stem. For fresh cut flower use, cut flowers when 2-3 florets are fully open. *Ornithogalum dubium* (Doubtful lily) is excellent for pots. Several species are too tender to grow outdoors in hills. It



Ornithogalum conicum



Ornithogalum conicum

is best grown between 12°C to 22°C and can also tolerate 3°C to 26°C. But it feels most comfortable if the minimum temperature remains around 7°C. It originated in Europe, Britain, North America and South Africa.

Ornithogalum needs sun or partial shade and well-drained soil. The tender species are lifted and dried for winter. They are replanted in October or spring in hills at a depth of 5cm and

10-15cm apart in rockery or beds or pots for obtaining flowering in spring and summer according to the planting time. They can also be propagated by seeds. The best time for planting is October for plains and hills as well. In plains the plants flower during February-March.

Apart from *Ornithogalum dubium*, the other popular species is *Ornithogalum conicum*. *Ornithogalum conicum* bears 30-40 white florets on multiflowered raceme, 7.5-10cm long on 80-120cm high plants. In *Ornithogalum arabicum* (Star of Bethlehem) the fragrant floret number is 10-20, white with a black ovary and the florets are 2.5cm long. The height of the plant is 75-100cm. *Ornithogalum thyrsoides* (Chincherinchee) is grown as a pot plant and bears a dense conical spike of cup-shaped white flowers 2-3cm across on 30-45cm high plants. The spread of the plant is 10-15cm. In *Ornithogalum longibracteatum*, the flowers are white and green on 45-60cm high plants.

Ornithogalum maculatum bears yellow or orange or orange-red blossoms. The outer segments are usually with black or yellow markings.

SWORD LILY

FAMILY : IRIDACEÆ

Other common names : Gladiolus

This is an attractive funnel-shaped winter flower produced on a spike in numerous colours. The six petalled blooms look to the same way and the leaves are upright and sword like. The colour variation is immense, i.e., white, lavender with cream lipped petals, deep violet, deep black-rose, pale-coffee, bright red, wine-red blotches on petals, deep watermelon pink and many more. It is reminiscent of peacock orchid (Scented gladiolus) to which it resembles very closely. The chief variation appears to be that Scented gladiolus (*Acidanthera*) has straight outer parts of the flower comprising the calyx and corolla, called perianth tube as opposed to the bent ones of Sword lily and has lovely fragrance. The Sword lily mainly flowers in winter right upto April in cool plains. Of course, there are few varieties that bloom round the year. The differences in gladiolus varieties are enormous. The height of the flower stalk which rises from the corm may reach more than 30cm or as much as 150cm. The planted dates are staggered so that a succession of blooms is obtained. It can be grown in pots and beds for cut flowers where it shows up elegantly. When used as a fresh cut flower, cut when 1-2 florets are fully coloured. The plant requires careful staking. It comes from South Africa and can withstand temperature down to 0°C to -5°C.

It grows successfully both in the plains and the hills upto an altitude of about 2500 metres. In northern plains the modern hybrids are best planted from September to October and many times even in August. In colder climates the planting is done in March-April. It needs a fertile well-



Gladiolus

drained soil and sunny location. The corms are planted 8-10cm deep and the same distance apart. The corms should be lifted after flowering when the leaves turn brown. It can also be raised by seeds or cormlets from parent corm but the seeds and cormlets take 2-3 years to flower. Moreover, the seeds do not breed true to type.

Most *Gladiolus* hybrids are obtained from *Gladiolus* X *hortulanus* and are divided into two groups namely *Grandiflorus* and *primulinus*. The *Grandiflorus* produces long, densely packed spikes of funnel shaped flowers and the petals can be ruffled, thick

textured or plain edged thin textured. In this group, the giant flowered hybrids may have a bottom flower of over 14cm across; large flowered 11-14cm across; medium flowered 9-11cm across; the small-flowered 6-9cm across.

The *primulinus* group shows fairly loose spikes of plain edged funnel shaped blooms, 6-8cm across, each with a strongly hooded upper petal over the stigma and anthers. The length of the spike may be 30cm.



Gladiolus carneus

Other species and hybrids grown in the gardens are:
 (i) *Gladiolus carneus* yields white flushed pink flowers of 10cm across
 (ii) *Acidanthera bicolor* (*Gladiolus callianthus*) gives white flowers with star-shaped crimson-maroon blotch in the throat, 5-7cm across, prized as a cut flower
 (iii) *Acidanthera bicolor* var. *murielae* produce blooms with distinct purple spot at the base of the petals and can withstand temperature down to 0°C. (iv) In gladiolus miniature hybrids, orchidiola varieties display red, pink, purple, white, yellow, bicolored fragrant flowers, 5-7.5cm across.

TORCH LILY

FAMILY : LILIACEAE

Other common name : Red hot poker

The majority of species come from South Africa. These are interesting and attractive plants forming tufts of long, narrow, backward arching leaves from which in the flowering season grow stalks more than 100cm high terminating in thick spikes of tubular, drooping blossoms in brilliant colours.

The Torch lily grows best in a good well-drained, humus soil and in a sunny place. The best time for planting is March-April in the hills and October in the cool plains. The plants thrive best where the minimum temperature comes down to 0°C and so are not comfortable in plains. During growing periods, they need a reasonable amount of moisture and liquid manure is beneficial. The plants can be killed by winter dampness. Torch lily has an exotic appearance and can be used anywhere. It is well-suited to large groups amongst low-growing plants. The species are propagated by seed during spring in hills and in October in cool plains. The named cultivars are propagated by divisions.

Hybrid varieties (*Kniphofia hybrida*) are mainly cultivated and colour choice is great varying from golden yellow, light yellow, orange, orange red, straw and flaming red, etc. *Kniphofia uvaria* (Red hot poker) var. *nobilis* bears a dense terminal raceme of tubular, bright and flowers on 180cm high plants. In *Kniphofia uvaria*, the true poker flower spike is red or orange at the top and yellow at the base on 75cm-150cm high plants. The spread of the plant is 90cm. *Kniphofia rooperi*, 120cm high, a fascinating species from South Africa which produces unconventional orange and red spikes which appear almost oval rather than the traditional poker.

TUBEROSE

FAMILY : AMARYLLIDACEAE

Tuberose is a pleasing and fragrant cut flower plant in which kingly flowering stalk emerges from the centre of the cluster of leaves. The flowers may be single or double, pure white and highly fragrant. Usually, the single flowered cultivars are more fragrant than the double flowered ones. Some species can tolerate winter temperature down to 0°C or may be frost tender. In cool plains it thrives well in temperature of



Polianthes tuberosa

around 15°-20°C. It requires good water in spring and summer. Liquid manure is essential after every two weeks when it is actively growing. After flowering, the flowering stalk is cut down to encourage production of more blossoms in succession. The bulbs can be left undisturbed in the soil and at times these can be taken out and replanted in



Polianthes tuberosa

October on the plains and in May-June on the hills at a depth of 12.5cm and 10-15cm apart. The suitable bulb size is 8-12cm in diameter. The most popular species is *Polianthes tuberosa*—It has a basal cluster of strap-shaped erect leaves. It produces a spike of fragrant funnel-shaped single or double white flowers upto 30 in number with six spreading petals on 60-100cm high plants. The spread of the plant may be 10-20cm.

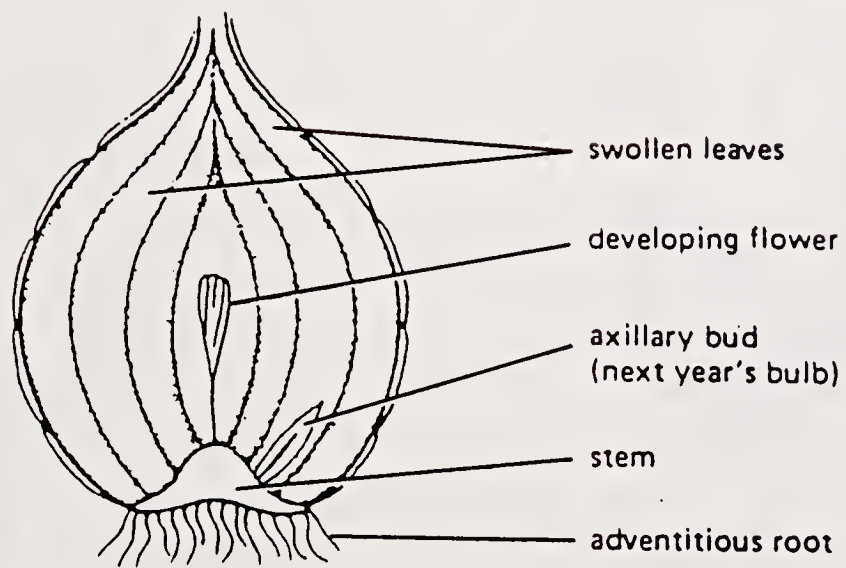
TULIP

FAMILY : LILIACEAE

The spring garden in hills as well as in cool plains and the coloured catalogues overflow with tulips. There is no need in these pages to sing their praise devotedly nor to illustrate the numerous species and varieties which are available. Instead this essay on tulips is devoted on general groups, rules for success and some admirable species. Tulips are grown for their bright, upward facing flowers in gardens and for fresh use. Flowers have usually 6 pointed petals and 6 stamens though known otherwise. Each plant has a spread



Tulip



Tulip bulb



Collage tulip



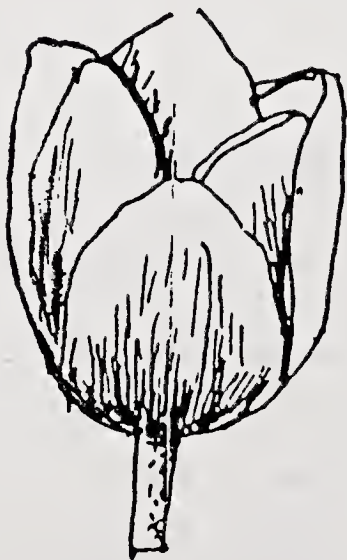
Rembrandt tulip



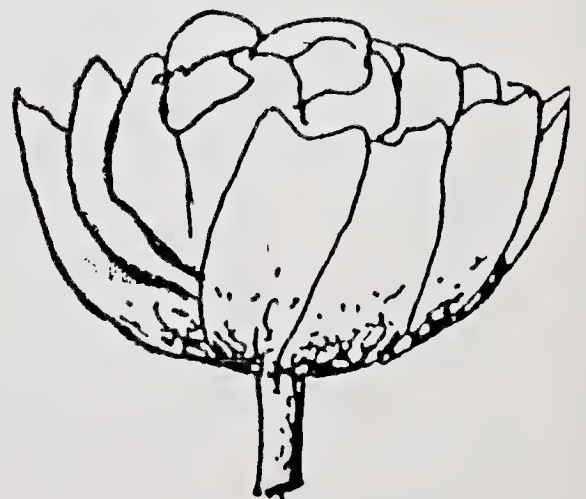
Parrot tulip



Double late tulip



Single early tulip



Double early tulip

*Triumph tulip**Darwin tulip**Lily flowered tulip*

of upto 20cm. The Tulip can bear minimum temperature down to -15°C though known otherwise.

Tulips can succeed in any well-drained garden soil which does not become waterlogged and thrives best in full sun. The garden hybrid classes are most popular—these are grown as bedding plants coming after the Narcissi and are lifted when the flowering is over and the leaves have turned brown. The dried bulbs are stored in a cool place. There are many elegant and splendid varieties including dwarf for the rockery and pots. Some can be left in the ground in hills over winter. It originated in Europe, Western and Central Asia, North Africa and Himalayas.

The bulbs are planted in October in cool plains and during October-December in hills. The flowering takes place in February-March in cool plains and during March-May in hills. The bulbs brought from hills or imported from abroad bloom in the first year in Delhi (cool plains) but die down afterwards. The bulbs are planted about 8-10cm deep and about 15cm apart. The bulbs are lifted from the ground every year to obtain better quality flowers next year.

Horticulturally, the tulips are grouped into numerous divisions depending on the shape and size of flowers and period of blooming. Some of them are shown in figures.

Several species are popular. *Tulipa urumiensis* bears 1-2 yellow flowers each 4cm long and tapered at the base. *T. turkestanica* has a hairy stem and unpleasant smelling, flowers upto 12 per stem. Oval white petals are flushed green or pink outside. In *Tulipa sprengeri*, the petals are narrowly oval and orange red. *T. kaufmanniana* (Water lily tulip) produces often scented flowers. Narrowly oval petals are usually either cream or yellow flushed with pink or grey green outside. Centres are often of different colours. *T. bakeri* produces 4-5.5cm long 1-4 scented flowers on a stem. Oval pink to lilac petals are yellow at the base inside. *T. biflora* bears 1-5 fragrant yellow centred, white flowers on a stem. It is suitable for a rock garden.

WATER LILY

FAMILY : NYMPHÆACEÆ

Water lily originating in India, Europe, Africa, Australia and tropical America is one of the most suitable and attractive water plants grown for its usually floating rounded leaves and brightly coloured flowers. Some species can withstand winter temperatures down to -10°C whereas some are frost tender. It needs an open sunny position and still Water. The fading leaves are regularly removed to avoid pollution of the pond water. The plants have tuber-like rhizomes and require division after every four years. The frost tender species in

hills are usually classed as annuals. The Water lily can be multiplied by seeds or by dividing plantlets in spring or early summer in hills. In cool plains the planting can be done at any time of the year. The planting can be done using a pot filled with humus rich soil and a plantlet as in lotus. Dwarf Water lilies can be grown in 15 to 45cm deep water only by placing divided plantlets in soil and slowly raising the level of water as the growth starts. Large varieties like *Victoria regia* thrive well in deep Water only. One plant of Water lily is enough for an area of 30 sq.cm. Besides the water lily, oxygenators or aerating plants should also be grown as they protect the fish, i.e., gold fish which are generally put in the pond. Water tape grass (*Vallisneria spiralis*), Arrowhead (*Sagittaria latifolia*), Water hyacinth (*Eichornia crassipes*) are some aerating plants.

Several striking varieties and hybrids of Water lilies are popular. The flowers, often fragrant are garnet-red, cream to yellow, bright yellow, deep blue, bright blue, pure white, deep pink, orange and crimson, lavender-blue, rich purple and in many other shades. The flowers are single, semi-double or double. A garden form of *Nymphaea pygmaea* produces plant with a spread of up to 45cm and has small olive green leaves and semi-double yellow blossoms.

WIND FLOWER

FAMILY : RANUNCULACEAE

Wind flowers are one of the most important and ornamental low growing early to late flowering plants and for this reason are almost indispensable in the garden. The rounded, shallowly cup-shaped flowers in blue, white, pink, red, purple, rose-pink, yellow pink flushed white colours look most beautiful in pots, borders and flower vases. Some of the species produce scented blooms in single, semi-double or double forms. For fresh use, cut when the flower has just opened.



Anemone hybrid

The home of the species is Mediterranean region and it can tolerate temperature down to -5°C to -15°C . They grow best in well-drained soil in full light or semi-shade in hills and cool plains. They dislike wet soil. They are propagated by root cutting and tubers during September-October in cool plains and autumn or spring in hills. The tubers are lifted after flowering. In *Anemone japonica* and

Anemone coronaria, seeds are also used for raising new plants. The crop time from transplanting to flowering is 12-16 weeks.

Several species and hybrid garden varieties are cultivated. Many hybrids produce poppy like anemone blooms but some varieties show up Chrysanthemum like flowers. *Anemone coronaria*, popularly known as Poppy anemone with blue, red, pink or white single, 5-8 petalled shallowly cup-shaped F₁ flowers is most beautiful. They are used as fresh cut flowers. Other important species and hybrids are: (1) *Anemone X fulgens* produce scarlet flowers on 30-40cm high stems. It prefers sun with a little shade in hot climate. (2) *Anemone nemorosa* (Wood anemone) is up to 15cm high with masses of star-shaped single white flowers. (3) *Anemone ranunculoides* (Buttercup anemone) bears buttercup-like double yellow flowers and likes damp, woodland conditions. (4) The fourth charming species is *Anemone apennina* (Apennine anemone) with a large, upright, flattish blue, white or pink flower on each stem on 15-20cm high plant. (5) *Anemone X hybrida* (*Anemone japonica* of gardens) does not grow well in plains and is up to 30cm to 120cm high bearing shallowly cup-shaped single, semi-double or double flowers late in summer and autumn in pinkish mauve or deep pink colour chiefly.

ZEPHYR LILY FAMILY : AMARYLLIDACEAE

Other common name : Rain lily

Coming from South America, Zephyr lily is reminiscent of Crocus blossoms. The plants are short growing (15-20cm) with very narrow grass-like leaves. It is ideal for cultivation in grass, under large trees, in the front line of shrubbery and for edging. It is extremely adorable when planted in mass. It can tolerate winter temperatures of around 0°C to 5°C. It needs, a sheltered, sunny situation and open, well-drained

but moist soil. The pot-grown bulbs need a slightly dry warm period after the decline of foliage in hills. The bulbs are planted during March-April or October both on the plains and hills. The depth of the planting of bulb is about 6-8cm and 7-8cm apart. In pots 20cm in diameter, 6-8 bulbs can be placed. The flowering takes place during the end of summer and the rainy season in the plains and in the rainy season and autumn in the hills.



Bulb and flower of zephyr lily

The flowers open in the morning and close in the afternoon. The bulbs are lifted after every three years. The multiplication of bulbs is very fast.

Several species are under cultivation :

(1) *Zephyranthes candida*—Each leafless stem bear Crocus-like white flowers upto 6cm across on 15-30cm high plants. The spread of the plant is 6-8cm. (2) *Zephyranthes grandiflora* (*Zephyranthes*

carinata, *Zephyranthes rosea*) bears funnel-shaped, pink flowers, held almost erect on 20-35cm high plant. The spread of the plant is 8-12cm. (3) *Zephyranthes citrina* produces funnel-shaped bright yellow blossoms 4-5cm across.

GLOSSARY

- Alkaline.** With a pH value of more than 7; some plants will not tolerate alkaline soils and must be grown in neutral or acid soil.
- Alpine.** A rather vague term used to describe low-growing rockery perennials.
- Annual.** A plant that completes its life cycle, from germination through to flowering and then death, in one growing season.
- Anther.** The part of a *stamen* that produces pollen.
- Apex.** The tip or growing point of an organ such as a leaf or shoot.
- Axil.** The angle between a leaf and stem where an axillary bud develops.
- Basal shoot.** A shoot arising from the neck or crown of the plant.
- Bearded.** A petal bearing a tuft or row of long hairs.
- Bedding plant.** A plant that is mass planted to provide a temporary display.
- Biennial.** A plant that flowers and dies in the second season after germination producing only stems, roots and leaves in the first season.
- Bloom.** A flower or blossom.
- Bract.** A modified leaf at the base of a flower or flower cluster. Bracts may resemble normal leaves or be reduced and scale-like in appearance; they are often large and brightly coloured.
- Bud.** A rudimentary or condensed shoot containing embryonic leaves or flowers.
- Bulb.** A storage organ consisting mainly of fleshy scales and swollen, modified leaf-bases on a much reduced stem. Bulbs usually, but not always, grow underground.
- Bulbil.** A small, *bulb*-like organ, it may be used for propagation.
- Bulblet.** A small *bulb* produced at the base of a mature one.
- Calyx.** The outer part of a flower, usually small and green but sometimes showy and brightly coloured, that encloses the petals in bud and is formed from the sepals.

- Climber.** A plant that climbs using other plants or objects as a support.
- Compost.** Either decomposed vegetable or animal matter for incorporation in the soil or a potting/cutting/seed sowing mixture made from peat (soiless compost) or sterilized soil (loam compost) plus other materials such as sand, chalk and fertilizers.
- Compound.** Made up of several or many parts, e.g., a leaf divided into 2 or more *leaflets*.
- Corm.** A bulb like underground storage organ consisting mainly of a swollen stem base and often surrounded by a papery tunic.
- Cormlet.** A small corm arising at the base of a mature one.
- Corolla.** The part of a flower formed by the petals.
- Corona.** A petal like outgrowth sometimes borne on the *corolla*, e.g., the trumpet or cup of a *Narcissus*.
- Corymb.** A racemose flower cluster in which the inner flower stalks are shorter than the outer, resulting in a rounded or flat-topped head.
- Creeper.** A plant that grows close to the ground, usually rooting as it spreads.
- Cultivar.** It is 'cultivated variety' which originated in cultivation and not in the wild. Strictly speaking, virtually all modern varieties are cultivars.
- Cutting.** A section of a plant that is removed and used for propagation. The various types of cutting are : basal—taken from the base of a plant (usually *herbaceous*) as it begins to produce growth in spring; **greenwood**—made from the tip of young growth; detached leaf or part of a leaf; **softwood**—young growth taken at the beginning of the growing season; **tip**—a greenwood cutting.
- Dead-head.** To remove spent flower head so as to promote further growth or flowering, prevent seeding or improve appearance.
- Deciduous.** Losing its leaves annually at the end of the growing season.
- Disbud.** To remove surplus buds to promote larger flowers or fruits.
- Disc floret, disc flower.** A small and often individually inconspicuous, usually tubular flower, one of many that comprise the central portion of a composite flower head such as a Dahlia.

Division. A method of propagation by which a clump is divided into several parts during dormancy.

Dormant Period. The time when a plant has naturally stopped growing due to low temperatures and short day length.

Elliptic. Broadening in the centre and narrowing towards each end.

Evergreen. Retaining its leaves at the end of the growing season although losing some older leaves regularly throughout the year.

F1 hybrid. The first generation derived from crossing 2 distinct plants, usually when the parents are pure bred lines and the offspring are vigorous. Seed from F1 hybrids does not come *true* to type.

Family. A group of related *genera*.

Fertilization. The application of *pollen* to the *stigma* to induce the production of seed.

Fibrous root. A fine, young root, usually one of many.

Filament. The stalk of an *anther*.

Floret. A single flower in a head of many flowers.

Flower head. A mass of small flowers or florets that together appears as one flower, e.g., Dahlia.

Flower. The basic flower forms are : single, with one row of usually 4-6 petals. semi-double, with more petals, usually in 2 rows, double, with many petals in several rows and few or no stamens; fully double, usually rounded in shape, with densely packed petals and with the stamens obscured.

Force. To induce artificially the early production of growth.

Fruit. The structure in plants that bears one or more ripe seeds.

Genus. A group of closely-related plants containing one or more species.

Germination. The emergence of the root and shoot from the seed.

Ground cover. An ornamental plant which requires little attention and is used to provide a low-growing and weed-proof carpet between other plants.

Herbaceous. Dying down at the end of the growing season.

Humus. Term popularly applied to partly decomposed organic matter in the soil. Actually humus is the jelly-like end-product which coats the soil particles.

Inflorescence. A cluster of flowers with a distinct arrangement, e.g., *corymb*, *panicle*, *raceme*, *spike*, *umbel*.

Lateral. A side growth that arises from the side of a shoot or root.

Leaflet. The subdivision of a compound leaf.

Marginal water plant. A plant that grows partially submerged in shallow water or in moist soil at the edge of a pond.

Mulch. A layer of organic matter applied to the soil over or around a plant to conserve moisture, protect the roots from frost, reduce the growth of weeds.

Offset. A small plant that arises by natural vegetative reproduction, usually at the base of the mother plant.

Panicle. A branched raceme.

Pedicel. The stalk of an individual flower.

Perennial. Living for at least 3 seasons.

Perianth segment. One portion of the perianth, resembling a petal.

Perianth. The outer parts of the flower comprising the calyx and the corolla.

Petal. One portion of the often showy and coloured part of the *corolla*.

Petaloid. Like a petal.

Petiole. The stalk of a leaf.

pH. The scale by which the acidity or alkalinity of soil is measured.

Pinch out. To remove the growing tips of a plant to induce the production of side-shoots.

Piping. A cutting obtained by pulling off the tip of a non-flowering shoot.

Pistil. The female part of a flower comprising the *ovary*, *stigma* and *style*.

Pollination. The transfer of pollen from the anthers to the stigma of the

same or different flowers, resulting in the fertilization of the embryonic seeds in the ovary.

Raceme. An unbranched flower cluster with several or many stalked flowers borne singly along a main axis, the youngest at the apex.

Ray floret, ray flower. One of the flowers, usually with strap-shaped petals, that together form the outer ring of florets in a composite flower head such as Dahlia.

Ray petal. The petal or fused petals, often showy, of a ray floret.

Recurved. Curved backwards.

Reflexed. Bent sharply backwards.

Rhizome. An underground, creeping stem that acts as a storage organ and bears leafy shoots.

Root. The part of a plant, normally underground, that functions as anchorage and through which water and nutrients are absorbed.

Scale. A reduced or modified leaf.

Scape. A leafless flowering stem.

Self seed. To produce seedlings around the parent plant.

Sepal. Part of a *calyx*.

Shoot. The aerial part of a plant which bears leaves.

Spadix. A *spike*-like flower cluster that is usually fleshy and bears numerous small flowers.

Spathe. A large bract, or sometimes frequently coloured and showy, that surrounds a spadix (as in *Arum*) or an individual flower bud (as in *Narcissus*).

Species. Plants which are genetically similar and which breed true to type from seed.

Spike. A racemose flower cluster with several or many unstalked flowers borne along a common axis.

Stamen. The *anther* and *filament*.

Stigma. The part of the female part of the flower, borne at the tip of the style, that receives pollen.

- Stop.** To remove certain growing points of a plant so as to control growth or the size and number of flowers.
- Strain.** A selection of a variety, cultivar or species which is raised from seed.
- Style.** The part of the flower on which the *stigma* is borne.
- Synonym.** An alternative plant name.
- Tendrils.** A thread like structure, to provide support.
- Throat.** The tube formed by the *corolla* of some flowers.
- Transplanting.** The movement of a plant from one site to another.
- True.** Retaining the distinctive characteristics of the parent when raised from seed.
- Truss.** A compact cluster of flower often large and showy.
- Tuber.** A thickened, usually underground, storage organ derived from a stem or root.
- Umbel.** A usually flat-topped or rounded flower cluster in which the individual flower stalks arise from a central point.
- Variiegated.** Leaves which are spotted, blotched or edged with a colour which is different to the basic one.
- Variety.** Strictly speaking, a naturally occurring variation of a species.
- Vegetative reproduction.** Division, cuttings, grafting and layering as distinct from sexual reproduction by seeds.



PUBLICATIONS DIVISION
MINISTRY OF INFORMATION & BROADCASTING
GOVERNMENT OF INDIA



ISBN: 81-230-0974-7

Price : Rs. 125.00

This book is a picturesque presentation providing information on bulbous flowering plants commonly grown for business or pleasure. It is a handy guide for flower lovers.

The author Dr. B.B. Sharma, a former Professor of Horticulture, IRAI, New Delhi, has authored many books on Horticulture and Home Gardening.

