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Commercial Ornamental Crops

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# Traditional and Loose Flowers



R. L. Misra  
Sanyat Misra

Commercial Ornamental Crops  
**Traditional and Loose Flowers**

## The Editors

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**Dr. R.L. Misra** served the cause of floricultural science for more than 16 years in temperate regions of Himachal Pradesh and about 24 years in sub-tropical conditions of New Delhi. After his joining at IARI, New Delhi in 1984, he was associated with all the 7-8 floricultural courses being offered to the M.Sc. and Ph.D. students, apart from looking his mandated research programmes. Out of his whole official career, as a chairman, he guided 16 Ph.D. and 6 M.Sc. students apart from being members of the advisory committees of many more students, and developed 30 gladiolus varieties which have high demand countrywide. Now all these students are serving various institutions as Professors and Associate Professors and in other departments holding a very high position. His contributions are acclaimed worldwide. As a teacher as well as a researcher, his contribution is well known as he has in all some 500 publications out of which some 170 are research publications, 80 symposium papers, 80 book chapters, a few review articles including 6 books. He is the founder member of Indian Society of Ornamental Horticulture from 1993 to 2004 (12 years continuously) he edited its regular publication Journal of Ornamental Horticulture. He is Fellow of Indian Society of Genetics and Plant Breeding since 80's, and Indian Society of Ornamental Horticulture since 2010. For his most significant contribution in the field of floriculture, he was honoured with 'Gold Medal' of Horticultural Society of India in 2013. He is life member in 11 professional societies. Once he was Officer-in-Charge, Indo-Israel Project of Research and Development on Farms, IARI, New Delhi which confines to the protected cultivation of vegetables and flowers; and joined as a regular Project Coordinator of All India Coordinated Research Project on Floriculture of ICAR at Division of Floriculture and Landscaping, IARI, New Delhi where he coordinated some 21 centres across 17 states. He served IARI for 40 years and retired as Project Coordinator *cum* Principal Scientist in May 2008. Only because of his highly significant contributions in the field of teaching and research, after his retirement he was inducted as adjunct Faculty of IARI in Floriculture.



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# Commercial Ornamental Crops Traditional and Loose Flowers

*- Editors -*

**R. L. Misra**  
**Sanyat Misra**



**Kruger Brentt**  
P u b l i s h e r s

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Dr. R.S. Paroda  
Founder Chairman



## Foreword

Since the times immemorial, the plants and flowers have remained an integral part of Indian rituals and source of ecofriendly pigments, besides being a source of chemicals of industrial and medicinal use. India is bestowed with wide range of agroclimatic conditions that support rich plant diversity.

In the recent years horticulture in India has fast developed on commercial lines and today we are among the leading producers of fruits, vegetables, flowers and spices. In the present scenario floriculture holds potential for agricultural diversification and improving farmer's income in the otherwise predominant cereal based farming. Though India is among the leading countries in flower cultivation but our share in global flower trade is less than one percent. In India, floriculture as a subject was introduced at UG and PG level in early 1950s. The establishment of All India Coordinated Research Project on Floriculture, brought the research efforts under one umbrella. In recognition of increasing importance of floriculture in India the AICRP later on was upgraded as into Directorate of Floriculture Research at Pune.

The authors, Drs. R.L. Misra and Sanyat Misra, have already brought out two books: (i) **Commercial Ornamental Crops: Cut Flowers** and (ii) **Commonly Used Ornamental Plants**, both published from Kruger Brentt, England, and now current publication **Commercial Ornamental Crops: Traditional and Loose Flowers** is the third book in the series to be published from the same publisher.

The book "**Commercial Ornamental Crops: Traditional and Loose Flowers**" deals exclusively on production technology of 29 most commonly cultivated ornamental plants and related aspects of post harvest management for various commercial ventures.

It is expected that the book will cater to the needs of students, teachers, researchers, horticultural training centres and development officers engaged in the field of horticulture, and over all to the growers to generate more income, and wish the team all success in their all the future endeavours.

(R. S. Paroda)  
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# Preface



Since the time immemorial, the flowers in Asian system are being used traditionally irrespective of the caste, creed and religions. There are many plants and trees which are therefore attached with our day-to-day life and many a plants have been associated with gods and goddesses. All over India and elsewhere, people from different walks of life, irrespective of their sex, faith, creed and caste grow some ornamentals near their homes to be used in needs. Also in the villages, mostly there used to be one patch where local flowers were allowed to grow on their own from where villagers used to pluck them for ceremonial occasions and for offering to gods and goddesses. The trees or shrubs emitting pleasant odours especially by the sunset used to be planted in villages. Then there was no flower market, no flower business or any other thing alike and the people used to collect them unhesitatingly from anywhere, irrespective of the fact that who is growing these. For making the look of the house and its surrounding beautiful, people were and are using ornamentals by planting around. Even in the orchard one can see such plantings and there had been no restrictions that who will use them. These are *Amaranthus*, *Amaryllis*, *Barleria*, *Bougainvillea*, *Calotropis*, *Canna*, *Catharanthus*, *Celosia*, *Clerodendron*, *Codiaeum*, *Crossandra*, *Dahlia*, *Dendranthema*, *Eranthemum*, *Ervatamia*, *Gaillardia*, *Helianthus*, *Heliconia*, *Hibiscus*, *Impatiens*, *Ixora*, *Jasminum*, *Narcissus*, *Nerium*, *Pandanus*, *Polianthes*, *Rosa*, *Tagetes*, *Thevetia* and so on, which people used to grow and enjoy, and out of which a few were and are being used even for extraction of essential oils. These flowers were being plucked or harvested to be used for certain arrangements, decorations, for making garlands or for offering at the religious ceremonies or meant for social celebrations. In Thailand no marriage is solemnized without exchange of floral garlands of *Calotropis* between brides and bridegrooms. Loose flowers are, in fact, not really the loose ones as the name spells, they may be quite compact but the people pluck them from the parent plant without stalks for net instant use. Since there was no concept in Asian countries for enjoying them indoors by arranging them in flower vases so such flowers were without a part of the stalk as in the cut flowers but now cut flowers have also achieved an important place in the country. However, Asians residing in western countries, for their traditional use on certain occasions, import loose flowers from India. This country has several recognized markets in different cities. The cut flower concept we borrowed from western cultures. Here in this book, we have put our all efforts to include almost all the important ornamentals which not only in India are being grown but world over. We have tried to furnish here their 'A to Z' proper cultivation practices in a scientific manner. Moreover, there are various other chapters dealing with all branches of flowers to make this book truly comprehensive.

Indian Council of Agricultural Research, New Delhi has formulated an uniform course programme in Floriculture for Bachelor, Master's and Doctoral programmes, therefore, this book has been written to avoid any confusion that what are important **Traditional and Loose Flowers**, the second publication towards **Commercial Flower Series**. It is being



followed by the third publication, **Ornamental Plants in most Common Use.**, and fourth **Soilless Culture.** Mostly, even the teachers confuse that apart from barleria, crossandra, jasmine, marigold, rose and tuberose, is there any other ornamental to be used as traditional and loose flower or what is the difference between loose and cut flowers. Yes there is, hence this book as from those formulated in the course, we have added many other regional flowers to substitute a few as suggested in the course contents. We assure that not only to the students and their professors, this book will be useful but will also serve an useful guide to the scientific community of floriculture, the landscapers and horticulturists, the growers and other garden enthusiasts. As All the crops are of universal appeal, hence this will certainly be appreciated worldwide. The book is first of its kind exclusively written on **Traditional and Loose Flowers.**

Though a few of the contributed chapters were found satisfactory, but certain chapters were so casual that we had to improve to a tune of some 90 per cent, therefore, hence forth the contributors are requested to be more careful.

**R. L. Misra**  
**Sanyat Misra**



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# Flower Arranging and Designing

Alka Singh

## Brief History

Knowledge of the floral arts of earlier cultures and civilizations is important so that the flower designer might better understand the derivation of the flower arrangement styles used today. Floral artists of the various periods of continental European art history used lavish quantities of flower types and colours to create a massive display. There is evidence for use of the flowers for decorative purpose during early Egyptian Period (2800-28 B.C.), Roman Period (28 B.C.-A.D.325), the Byzantine Period (A.D.320-600), throughout the Middle Ages (A.D. 476-1400), the Baroque Period (A.D. 1600-1775) as well as during the Victorian period (1820-1901) as described by Berrall (1997) and Hannay Frances (1948). The Italian artist Michelangelo greatly influenced the artistic transition from the classical Renaissance style to the lavish mood of the Baroque period. These arrangements were often created as symmetrical, oval-shaped designs early in the Baroque period, but asymmetrical curves in the shape of a 'S' or a crescent were later adopted. The period of French art history during the short reign of Louis XVI

(1774-1793) showed a continued movement to femininity in design styles. This was the result of the queen's direction in setting court styles. Flower arrangements of the Empire era were more compact than those of earlier French periods, with simple lines in a triangular shape and strong colour contrasts. A typical Empire design would be arranged in heavy urn containing an abundance of large, richly coloured flowers (Griner, 2011). The floral art of the American Federal period (1780-1820) took its styles from the Neoclassic and Empire designs that evolved in Europe at that time (Hannay, 1948). The American people wanted to break away from the traditions of England and desired to create their own national art styles. These floral designs were influenced most by the delicate French style, with the individual beauty of the flowers being stressed. In these designs, the height of the flowers was greater than the width of the arrangement. The sleek floral designs gradually gave way to the ornate and stuffy designs characteristic of the Victorian period.

The Oriental style, *i.e. Ikebana* originated in India, emphasized and modified in China and further developed

as an art form in Japan. It came to Japan with Buddhism from India *via* China, around 600 A.D. Formal offering of flowers on the Buddhist altar combined with the aristocratic taste for floral decoration and fused into a refined form, which evolved into *ikebana*. It is a disciplined art form, steeped in the philosophy of developing a closeness with nature. From the late Kamakura period to the Muromachi period (late 13th-15th century), large contests of flower arrangement were held in the court on the day of *Tanabata*. History says that it was at the *tanabata-hana-awase* (a floral competition held at Star Festival) that flowers first became the theme of an annual event. The festival dates from the time of Yoshimitsu Ashikaga (1358-1408), who loved flowers and had numerous flowers planted in his garden. People referred to his mansion as 'the palace of flowers'. The art of *ikebana* developed and flourished with the adventment of three leading schools of *Ikebana* in Japan, the Ikenobo school, the Ohara school and the Sogetsu school. The oldest *Ikebana* manuscript, 'Kao irai no Kadensho' dates from 1486. The famous 'Senno Kuden' manuscript, by the founder of the Ikenobo School of *Ikebana*, was written in 1542. Since this time, many styles have appeared, disappeared and developed as referred by Komoda and Pointer (1984). Japan's oldest school of *Ikebana* called ikenobo, having a 1400 year tradition as its heritage was established in the 15<sup>th</sup> century. The formal teachings of the complex form of *Rikka* were being given at ikenobo. *Chabana*, the classic *ikebana*, also called *Nagarie*, meaning 'to throw in', originated in the 16<sup>th</sup> century, which represented the natural beauty of flowers and did not require any complicated rules in arranging, to that of *Rikka*. *Shoka*, another form of *ikebana* evolved in the beginning of 18<sup>th</sup> century wherein *Rikka* and *Chabana* interacted with each other. The Ohara School of *Ikebana* dates back to the Meiji Period (1867-1912) that began with the efforts of Unshin Ohara, who although had studied at Ikenobo school, brought novel ways in *ikebana*, making it less rigid and formal with the introduction of *moribana*. After World War II, *Ikebana* began to be regarded by some as art, with the result that even works of avant-garde *Ikebana* appeared. Wire, metal and stone as well as flowers were used to the extent that it is sometimes difficult to distinguish these works from sculpture. This movement inspired the birth of 'Jiyuka' (free-style) *Ikebana*, which is completely liberated from the ideas and regulations of traditional *Ikebana*. Influence from the artistic movements of the early 20<sup>th</sup> century led to the development of *jiyuka* (free-style) arrangement. In the 1930's and then more so in the post-war period, interest in *ikebana* became much

more widespread. Led by Teshigahara Sofu, founder in 1927 of the Sogetsu school (Gupta, 2012), zen-eibana or avant-garde *ikebana* introduced all kinds of new materials, such as plastic, plaster and steel. There are about 3,000 *Ikebana* schools in Japan and thousands more are flourishing around the world. The Ikenobo school alone has some 60,000 teachers worldwide and is practised by about 15 million people in Japan, mostly young women. India has a tradition of garlands and floral ornaments, since time immemorial as depicted in our old scriptures and manuscripts, Ramayana and Mahabharata believed to have been compiled in 500 B.C. Beautiful description of floral ornaments adorned by women is found in the famous ancient writings, *viz.* 'Mrachhkatikam' by Sudraka (100 B.C.) and in 'Abhigyan Shakuntalam' by Kalidasa (57 B.C.). The traditional as well as modern day flower arrangement styles reflect the developmental and creative changes being followed throughout different historical era.

Flowers truly represent freshness, colour, fragrance and beauty, focusing on aesthetic and positive side of life. Flowers in the form of garlands or bouquets denote freshness, acceptance, a positive outlook and a newly blessed beginning of any important social function. Flowers have hidden message to cheerful life, the reason they have been an integral part of all important personal, religious or social ceremonies and rituals. As civilization progressed, society changed, so did the art forms and the use of flowers. From being used as offerings to Gods and Goddesses, to a mark of honour with laurel wreaths, to a form of adornment, flowers have evolved over time to what we today know as floral design or flower arrangement. Fresh flower arrangements are careful designing, augmenting the tender qualities of flowers in a more beautiful manner. Thus, the fresh flower arrangements with their beauty, charm and fragrance are hidden inspiration for a peaceful mind, motivating force behind creative work performance.

## Influence of Flowers on Human Psychology

Flowers display strong effect on immediate emotional behavioral expression and display positive emotion in human beings. Flowers depict human emotions beautifully besides enhancing and boosting creative ability. Offering flowers to someone has been associated with welcome and positive approach. Since

flowers entuse positive emotion in view of happiness in humans wherein its long-term expression leads to a prolonged involvement related to the feelings of social safety and would therefore be associated with social gathering (Ekman and Davidson, 1994) and family rearing (Mastekaasa, 1992). Various sensory elements of flowers like colour, fragrance, texture, softness, freshness, *etc.* in all, directly influence human psyche and awaken his/her senses, making him/her sensitive and aware of the existing wonderful nature. A recent behavioral study conducted in USA, at Department of Psychology, Rutgers University, and at La Salle University, Philadelphia, shows that persons who received flowers demonstrated increased social interaction and happiness (Haviland Jones *et al.*, 2005). Sight and fragrance of flowers combine to influence brain chemistry and stimulate more positive feelings, as reported by Dr. Jeannette Haviland-Jones, professor of psychology and director of the 'Human Emotions Lab' at Rutgers University, New Jersey. Researchers who have assessed the impact of nature and plants on human health have suggested that people-plant/flowers interactions provide physiological stress reduction. Flowers have a long-term positive effect on the mind frame. Flowers induce happy emotions that contribute in developing friendly environment for facilitating better social and personal connectivity within family, friends, as well business relations (Singh and Dhaduk, 2012). Thus, a view to a beautiful flower arrangement is refreshing and energizes human force to work with more optimistic approach (Singh, 2013).

## Flower Arrangement

Flower arrangement is the artistic display of flowers in a right manner and proportion so that the same may provide maximum pleasure and satisfaction, and create a quite peaceful, pleasant and congenial atmosphere at the place. It is an art of designing and arranging flowers aesthetically in a vase or bowl retaining their freshness for a longer time. It is organization of design, form and colours towards creating an ambience using flowers, foliage and other floral accessories. It is a throbbing and live creative art, that invokes aesthetic faculties of the mind. Flower arrangement endows with a magic touch to the cut flowers and grants value addition to more than 50% to the cut flowers (Singh and Dhaduk, 2011). The art of flower arrangement is a beautiful and creative hobby, *vis-a-vis* a lucrative business. Fusion of creativity and science of post

harvest handling is needed for developing the art of flower arrangement. Flower Arrangement is an important and integral part of life on almost all the occasions and events whether it be wedding, birthday, usual parties on various occasions, religious and other social functions, *vis-à-vis* beautifying homes and offices. There are basically three styles of arranging flowers, *viz.* Oriental (western style), Ikebana (eastern style) and contemporary free-style which are generally composed of cut flowers, foliage, twigs, stems, along with certain accessories (Hiller, 1974; Packer, 1998). Besides, in Indian tradition or to say in whole of Asia, loose flowers are used for designing floral arrangements in the form of *rangoli*, garlands, flower ornaments and hair decoration.

## Material for Flower Arranging

### 1. Containers

In floral design, the container is a foundation or base of the floral composition. A properly selected container should be functional and in harmony and unity with the arrangement (Aaronson Marion, 1983). Properties of container in flower arranging have been well defined by Blacklock (2006) and Ascher (1974). The container must be capable and deep enough for holding an adequate volume of water and to support the weight of the flowers. In case the container is unable to hold water, another container, which can hold water can be placed inside. Glass, metal, plastic, porcelain or glazed pottery container all have unique effect on flower designs. Metallic finishes require protection from the tarnishing that accompanies the use of floral preservatives in the container water. The shape and size of a container often suggests the type of design to be created within it. A large, heavy container requires a taller arrangement to balance the mass of the container. A beautiful curved style of arrangement calls for a dainty stemmed compote to provide balance. A horizontal dinner table arrangement is most attractive when constructed in a low and flat rectangular container. The lines of the container are repeated or accentuated to provide unity and harmony within a design. The colour pattern found in the container appears best when it either repeats those found in colour scheme of the design or when neutral colours are present in the container. The most utilitarian colours used in floral containers are green, white, gray, brown, tan or black. Green-coloured floral vases are often selected, since nearly all flower stems and foliage repeat

this colour. Brown containers appear best when this colour is duplicated in dried flowers, wood or autumn-coloured leaves. Metallic containers having a finish of silver, brass, bronze and gold leaf usually suggest a formal design. The containers with different shapes are termed differently, viz. (i) 'Vase', where height of the container is greater than its width, (ii) 'Bowl', where width of the container is greater than the height and it is often used for table arrangements, (iii) 'Pedestal', where the container is elevated on a base that may be short- or long-stemmed and is useful when a tall arrangement is needed yet the mass of a vase container is not desired, and 'S' curve and triangular types look perfect in pedestals, (iv) 'Basket' (made of metal, wood or bamboo), which are used for both vertical and horizontal but usually in informal designs including the 'round', and (v) 'Novelty' which are limitless in possibilities. Care should be taken to assure that they do not overpower the design. These are perfect specially for free styles.

## 2. Support Material

(i) **Needlepoint holders** ('pin holders' or 'frogs'): Needlepoint holders are customarily used for creation of modernistic and stylized designs by an amateur as well as by an *ikebana* artist as these are popular stem-supporting aids. These are available in various shapes and sizes (round, oval or square) to suit any particular arranging requirements and are made of coated iron, brass or copper. They may be placed in any location at the base of the container and anchored for temporary or permanent use.

(ii) **Chicken wire** (floral netting): The stem support aid used for large floral bouquets usually consists of chicken wire with 2.5-cm mesh and a filler material. The filler material may be of chipped floral foam, vermiculite or the wire may be used to cover a solid block of foam.

(iii) **Floral foam**: Various floral foam products are popular stem-supporting aids for both florist and home flower arrangement (Blacklock, 2006; Westland, 1992; Ascher, 1974). These floral foams are manufactured from resins in several shapes, colours and for various design purposes. They may be purchased in either rectangular bricks to be cut to fit individual containers, or in cylindrical blocks for uses in specialized containers. These products are extremely porous, so they provide water to the inserted flower stems used in the arrangement.

## 3. Tools Used

Various tools required in flower arranging include (a) '**knife**', a short blade made of quality steel is used to give sharp cut at the stem ends as well as floral foam, (b) '**secateurs**', having short blades with serrated edges are used for cutting both herbaceous and woody plant material, (c) '**pruning shears**', having two cutting blades of quality steel, used for cutting woody materials, and (d) '**ribbon shears**', being similar to ordinary scissors in appearance. Besides, different wires are also needed based on the floral design, such as (a) '**florist wire**', varying in length and thickness (gauge), the heaviest being No. 18 looking into the weight of the flower and foliage to support them, (b) '**chenille stems**', which are like pipe cleaners with extra flocking, and are used both for decorative purposes and to provide water to corsage flowers, (c) '**spool wire**', a heavy gauge wire is needed to wire arrangements such as wreaths and door swags, (d) '**twistems**' are short pieces of wire enclosed in paper for filling a number of roles where support of repair is needed, (e) '**wooden picks**' are generally green wood picks with a length of thin wire attached, which can be fastened to stems or other materials and inserted into a holding substance, are widely used with nonliving arrangements, and (f) '**floral tap**' having adhesive material on one side and is available in assorted colours to blend into arrangements, similar to a waxed crepe paper it is also used in making corsage or buttonaire, and as has stretching quality, it is used to wrap flower stems when wire is needed for their support.

## 4. Foliage and Flowers Used in Designing

Line type of design is thin, vertical and tapering and is made by using various flowers such as amaryllis, bells of Ireland, *Dendrobium*, gladiolus, golden rod, heliconia, iris, tuberose, *Vanda*, etc. and branches of bottle brush, *Murraya*, *Dieffenbachia*, etc. and foliage of areca palm, asparagus, cycas, fishtail palm, pandanus, sansevieria, snapdragon, etc. For mass designing in round shape at the centre of arrangement the flowers and foliage required are anthurium, China aster, dahlia, *Lilium*, fruits of apple, orange, pomegranate, etc. and foliage such as money plant, philodendron, syngonium, etc. For uncommon and unusual shape the flowers used are anthurium, bird-of-paradise, heliconia, orchids, etc. and the fruits of cashew, grapes, banana, etc. Fillers are used in case of

thin, spreading and small arrangements with the help of candytuft, daisy, larkspur, golden rod, gypsophila, lady's lace, larkspur, marguerite daisy, statice, aglaonema, asparagus, bottle brush, casuarina, eucalyptus, ferns, silver oak, *Murraya*, *Thuja*, etc.

## Classification of Flower Arrangement

Basically three styles of arranging flowers have been evolved, viz. **western style**, **eastern style** (*Ikebana*) and **contemporary style** (free style) which are generally composed of cut flowers, foliage, twigs and stems with some accessories as described by Singh and Dhaduk (2006). Besides, loose flowers are also used for designing flower arrangements in form of *rangoli*, garlands, floral ornaments and hair decoration. Formal offering of flowers on the Buddhist altar combined with the aristocratic taste for floral decoration and fused into a refined form, evolved into *ikebana*. This art greatly influenced all aspects of life, culture and the arts. *Ikebana* is a disciplined art form in which the arrangement is a living thing in which nature and humanity are brought together. Steeped in the philosophy of developing a closeness with nature, it is the art of association of ideas and impressions of nature expressed through flowers. Contemporary styles of flower arrangement neither follow geometrical forms of western type flower arrangement nor the strict rules of *ikebana*, and has a large scope of displaying aesthetic sense and playing with and widening one's creative ability. There may be more or less number of flowers and foliage. The arranger can use sculpture, statue, candle or small fountain or even pot plants according to one's imagination and creativity. There are arrangements designed for festivals, celebrations, inaugural functions and even funerals depicting cheerfulness, emotions, changing seasons and melancholy.

### 1. Western Style

The emphasis is on the use of 'many flowers as a mass' in the oriental (western) style of flower arrangement. This style follows geometrical forms and consists of more number of flowers and depicts a complete and full effect (McDaniel, 1996). Balance, depth and rhythm are very important to be maintained. It displays mass effect hence repetition and continuity are very important to

exhibit appealing and aesthetic look. The basic principles involved in western style of flower designs are as under. By visualizing the plan about the shape and size of the arrangement, it is the **design** that decides the structural pattern whether it is a line, mass or a combination of both, depending upon the materials available, location and occasion. Such arrangements, irrespective of whether are symmetrical or asymmetrical, should have both mechanical, i.e. by all means the arrangement being commensurate to the container and visual **balance**. A well-designed arrangement should appear to be stable and self supporting. Balance is lost when the arrangement appears to be divided into several parts of areas and that shows gravitational instability. Dark colours give a visual effect of weight and so are used low in the arrangement though lighter colours are more appropriate for outer and upper portions. The **scale** or proportion of a design is dictated by the size of arrangement and its relationship to its surroundings. Proportion in an arrangement is accomplished by scaling flowers towards the focal point. The flowers are graded in size for placement of increasingly larger flowers in the arrangement until the focal point is reached. Gradation of line, texture, colour and flower form in graceful **rhythmic** form is characteristic of these designs. Motion is created most easily in a design having a curved line. Here the viewer is attracted gently from the top of the arrangement, along the curving elements of line or texture of colour through to its focal point, the centre of interest. Rhythm may be achieved in several ways through opposition, repetition, radiation, or transition. **Harmony** in flower arrangement indicates a pleasant composition of flower shapes, colours, textures and size. There is little or no abstraction and the plant materials are used in a naturalistic way. **Unity** is best achieved by repeating related flower types, colours and textures throughout the design. This principle involves appropriate use of flowers for the occasion and blending of flower colours in the floral arrangement. The central portion of the floral arrangement from where the flowers and foliage of the arrangement appear to be emerging is known as the **focal point (emphasis, vista effect or accent)** of the arrangement. The most striking contrast in a design is created by use of large and brightly coloured flowers at the centre of interest with less vibrant tones or tints on the outer perimeters of the design. Flowers with unique shapes also attract attention. The **broad types of designs** in western style of flower arrangement include various traditional designs, corsage, buttonaires and wreaths.

Symmetrically or asymmetrically 'triangular', 'round' ('spherical' or 'globular'), 'oval', 'Hogarth curve' ('S curve'), 'L shape' and 'crescent' are the standard patterns of traditional western style (Larmie, 1980; Griner, 2011; Singh and Kumar, 2007), and their techniques are described here with. The symmetrical **triangular** design is more traditional with line mass effect and this has an added advantage of displaying it in large sizes on any occasion. This is arranged in three basic lines of the triangle in the container, mass flowers are arranged in the geometrical design, the gaps are filled by proper arranging and fixing the fillers, and a complete and perfect look is given by covering the base and sides of arrangement with green foliage. The **round** arrangements are designed on dining or central tables and around the candles or candle stands, with lower heights, to be viewed from all the directions. This arrangement looks very attractive and has traditional mass effect. The steps involved in this design are arrangement of fillers of required length horizontally as per specification of the shape, arrangement of mass flowers evenly and the whole arrangement should radiate like the sun. The typical '**Hogarth curve**' ('**S curve**') arrangement is an elegant and exclusive design named after the English painter William Hogarth (1667-1744), which is perfect for home display and as a welcome for special guests, and it has an added elegance when designed in pedestal. The 'S' shape basic curved lines are prepared as per requirement by wiring two twigs of flower or foliage, then mass flowers are arranged within the specified design and then finally the gaps in the design are properly arranged by fixing the fillers. '**L shape**' arrangement is a form having similarity with asymmetrical triangle and basically a traditional line arrangement. Here arrangement in the container is made in two basic lines forming 'L' shape first, then mass flowers are arranged in geometrical form, and then finally the gaps are filled by proper arrangement of fillers. The **crescent**-shaped arrangement looks delicate and perfect for evening programmes whether at home or elsewhere in a general get-together, and the beauty is enhanced when it is designed in pedestal and bows. This arrangement denotes innocence and romance in life with cooling effects and for relaxing. Crescent can be prepared by wiring the flowers or foliage twigs. These are designed in a crescent-shaped curves by using two floral stems, then mass flowers are fitted in between to maintain the crescent shape, and then finally the gaps are designed by proper arranging and fixing of the fillers in between.

**Traditional western flower arranging design** (style) typically refers to all floral designs originating worldwide during middle of 20<sup>th</sup> century having influence of primarily Asian, European and Early Americans. Culmination of two main trends one from Asia with the Chinese emphasis on naturalism to the highly stylized linear designs of the Japanese and the influence of the massed bouquet art of Europe, which typically included all styles evolved in different periods (Hannay Frances, 1984; Berrall, 1997). Thus the traditional style of flower arrangement combined attention to both line and mass, creating many variations of the line, line mass, and mass arrangements (Packer, 1998; Singh, 2013). These classic designs are based on geometric shapes including ovals, crescents, spirals, triangles, the Hogarth curve, zigzags or other geometric forms, having one natural centre of interest somewhere near the central axis where all lines converge, with no evident crossed lines (Larmie, 1980). Traditional designs were initially arranged in different types of containers like bowl, vase, pedestal or novelty shaped flower pots using different shapes of pinholder for holding flowers. Later, floral foams were being used to make lovely designs in western style of flower arrangement.

In a **traditional line design** (arrangement), the line predominates and is strongly influenced by Asian design. Line designs are simple and clean resulting into a sharp open silhouette. Inspired by the forms in nature, this design depends upon normal patterns of plant growth and existing curves. A set pattern is usually required, e.g. triangle, vertical, horizontal, crescent, zigzag, etc. Various forms of line designs include inverted 'T' arrangement, 'L' pattern, vertical, crescent and Hogarth curve (McDaniel, 1996) while that of mass designs include round, triangle, oval or fan shaped. Typical **traditional line mass design** is a blending of European and Japanese design wherein linear qualities of a line design with the additional mass of plant material provides gradation and transition for balance and rhythm. Thus a line mass arrangement is similar to a line arrangement, but there is more massing of the material, creating a greater depth, the third dimension that is practically not much emphasized in line designs. Further, additional material mainly foliage is used at the rim of the container to enhance and strengthen the line and also to emphasize centre of interest. It has an open silhouette, a pleasing outline and an organized placement of flowers and foliage resulting in a predetermined form. A **traditional mass arrangement** is a bold and bountiful

highly symmetrical and well balanced arrangement with a range of flowers in many forms, sizes, colours and textures typically arranged in a round, oval, triangular or fan-shaped design (Aaronson Marian, 1983). It has a closed silhouette, more solid than being void. It is directly influenced from European design. Though the arrangement is typically compact but flowers should never be crowded. Focal point is emphasised in the centre using bolder flower forms with brighter hues.

**Corsages** and **buttonaires** are small floral decoration designed to be worn and are very popular in western countries (Griner, 2011). Corsage is a small floral arrangement designed beautifully to be attached to the dress or worn on wrist. Corsages are also sold extensively during the Christmas, Easter, and Mother's Day holidays in western countries. One of the more important uses for corsages in Europe is for weddings. Florist's corsage is so formed so that it resembles the arrangement in containers. The bow and trim become the integral part of the design and satin leaves may provide the foliage. The corsage must be constructed securely enough to retain its original design with minimum use of wires and floral tape to avoid large masses of stems at the base. Flowers should be positioned for best effect and firmness in construction. Flower colours should be coordinated with the dress, the complexion and hair colour of the wearer, and the lighting available (day or evening). **Floral wreaths** are formed in a circular garland, usually woven of flowers and foliage, that traditionally indicates honour or celebration. Wreaths are especially very popular on funerals as a symbol of honoring the deceased. Besides, they are also mostly used on occasions such as special celebrations and to welcome the guests as welcome wreaths when dinners are hosted. Wreaths are constructed on the wire frames by tying the greenery with a continuous strands of wire.

## 2. The Eastern Style ~ the *Ikebana*

Over the seven centuries of its evolution, *Ikebana* has developed many different styles of arrangement with different philosophies behind each. The first teachers and students were priests and members of the nobility. *Ikebana* symbolizes living flower. In Japanese *ike* means 'to set in' or 'to live', and *bana* means 'flower'. *Ikebana* is an expression of liveliness and has spiritual significance, depicting life and freshness (Komoda and Pointer, 1984). *Ikebana* finds its basis in the beauty and the meaning the humans have

for flowers is a perceived beauty, which originates from the essential bonds of man and nature. Japanese *ikebana* is a creative art, which brings indoors the charm and beauty of landscapes, the seashore or lakeside. It recreates nature on a reduced scale through the arrangement of all types of plant materials gathered from nature, i.e. from gardens, rivers and valleys. Though it is always based on principles of asymmetry yet the arrangement looks quite balanced, where only a few flowers are used to form basic lines of *ikebana* for giving filling effect, the arrangement depicts spacious and creative view, it signifies life being associated on the theme of nature, and it appears persisting and continuous. There are three basic lines in *Ikebana*, viz. **shin** which forms the most important basic line, symbolizes 'heaven' and expresses 'truth', and it equals the length  $\times$  width of the container  $\times$  1.5-3.0 times; **soe** forms the second important line and symbolizes man and expresses 'body of the human being' and its size equals to  $\frac{2}{3}$ - $\frac{3}{4}$  of *shin*; and **hikae** (*tai*) is the third important line symbolizing 'earth' which expresses support and denotes base and environment, and its size equals to  $\frac{1}{3}$ - $\frac{1}{2}$  of *shin*. So the three basic lines of *ikebana* are 'earth', 'man' and 'heaven'. The shape of *ikebana* container varies from informal to curved, double or partitioned types, tall, shallow or broad, rectangular, round or oval and are available in varied forms of porcelain and lacquer ware lined with copper and glass. Besides, baskets of metal and wood, and mostly traditional bamboos are used as *ikebana* container. A single, hollow bamboo container is cut to have double and triple openings for the purpose of incorporating different floral designs to form one complete composition. 'Ikonobo', meaning arranging flowers of the hermitage along a pool, was the first school of *Ikebana* which started in early 621 A.D. by Buddhist monk Semmu.

*Rikka* (standing flowers), *Nagiere* (*Chabana*; meaning thrown flowers), *Shoka*, *Moribana* (heaped up flowers), *Morimono* (triangular arrangement of fruits, vegetables and flowers), *Jiyuka* (*Jiyubana*; freestyle) and *Zeneibana* (avant-garden flower arranging) are the important styles of *ikebana*. The *rikka* style developed in Ikenobo, the oldest school of *ikebana*, is the Buddhist expression of the beauty of nature, with nine branches representing hills, waterfalls, valleys and so on arranged in a formalised way. *Rikka* is the basic and original style of *Ikebana* arrangement that uses tall vase and highlights vertical lines. In *rikka*, the emphasis is on elaborate technique, large-scale symbolism and fixed style where

the vases with a narrow opening or tall, jar-shaped containers are used, with the stems being bundled tightly together at the mouth. Crosspieces are used to fasten the stems to the vase. Hidden within the principles of this style is surprisingly fertile ground for variation and adaptation to contemporary environments. A *rikka* arrangement consists of nine parts (*yakueda* or *dogu*) in all and these are *shin*, *shoshun*, *soe*, *uke*, *mikoshi*, *hikae*, *nagashi*, *do* and *maeoki*. Sometimes not all of the nine *dogu* appear in the arrangement and at other times certain of the *dogu* are exaggerated, depending upon the purpose of the work or the characteristics of the materials. Each of these nine have a specific role and are arranged at a specific angle. **Chabana** is done in a tall vase with a few materials, having distinct three main lines or sometimes just two lines. The container is called *hanarie* meaning 'to put in flowers'. The distinctive feature of the *chabana* arrangement, from a technical viewpoint is that flowers in it are not made to stand erect by artificial means, but are allowed to rest in the vase naturally and so the vase used should be tall and narrow-mouthed. **Shoka** is a style that is less formal than *rikka*, but at the same time, not as free-flowing as *chabana*. It combines the dignity of *rikka* with the simplicity of *chabana*. Basic *shoka* pattern is upright, the way most plants grow in their natural state. *Shoka* consists of five lines in all with three major and two supporting ones. The basic lines of *shoka* are *shin* (heaven or truth), *soe* (man or support), *tai* or *hikae* (reserve or earth), *do* (trunk or base) (half of the *shin* in the centre) and *sugat naoshi* (improving line). **Moribana**, which means 'piled up flowers', is entirely different from the former 'standing' arrangement. *Moribana* is done in flat containers that allows for spreading out sideways. Changing from the former *Ikebana* emphasis on line, where the stems were kept in one clean vertical line at the water's edge, the concept of an arrangement of wider space and depth was born (Care, 1961). There are basic three lines in *moribana*, viz. *shin*, *soe* and *tai* (*hikae*). Besides, some *jushi* (fillers) are further arranged to enhance the overall look of *moribana*. There are different types of *moribana* based on the angle of the primary (*shin*) line, viz. basic upright, slanting and hanging, *kenzan* (pin holder) with many sharp points into which flowers are inserted and placed as off-centre in the container and never in the centre. In the *moribana* arrangement all the materials used must be fixed firmly in the pin-holder. **Under other types in *ikebana*** are ***morimono*** developed later in the 19<sup>th</sup> and 20<sup>th</sup> century with a simpler form. The basic principles remained the

same although fruits and vegetables were also used in this style. **Zeneika** (*zeneibana*) style was also developed later in the 20<sup>th</sup> century which allowed the use of sculpture and statues. **Jiyuka** (free-style *ikebana*) is the most recent to emerge from Ikenobo's long tradition. As a more personal expression it is suited to contemporary environments and tastes. Free style is sometimes broadly divided into a naturalistic style and a more abstract style. Both styles use plant materials in new ways, yet respect the beauty and essential qualities of each material. Flowing from the arranger's inventiveness in using materials to convey an effect or mood, free style's possibilities are unlimited.

### 3. Contemporary or Free-Style Designs

The contemporary (free) style of flower arrangement neither follows rules of geometrical shape of western style nor does it follow strict rules of eastern style. The aim of the free style is the beauty and expression. However, it is also based on some principles to maintain aesthetic look (Aaronson Marian, 1984). This style should be practiced after learning the western style of flower arrangement. This style is highly creative and expresses the aesthetic sense of the arranger. The basic principles include **balance**, i.e. where the shape of the free style may not be geometrical yet a perfect balance between the flowers arranged, container and the base or placement of the flower arrangement should be clearly visible. It emphasizes on the use of materials in a floral arrangement which gives stability to the arrangement. The overall arrangement should look in **scale** and **proportion** but free flowing with boundation of particular shape. All the floral material used in the arrangement should be in **rhythm** and should complement each other, *vis-a-vis* container. Whole of the arrangement should be in **harmony** and **unity** to please the viewer's eye. In spite of various flower materials being used, the arrangement should express unity and oneness. There are no standard patterns of free style. There is wide scope for the use of flower material for the arrangement. Besides, other material like drift- wood, stones, rock, a live plant in pot, statues, candle, candle stand, *etc.* can also be incorporated. Also, there is no fixed rules for the container type, form and plant material and stem supporting material. The free style can imitate natural landscapes with modern outlook in a stylish way. Few contemporary styles have been described by Miller (1981), Healey (1986) and Curtis (2004) as mentioned here with.

**Abstract designs** are bold in colour and form, innovative and creative in which unusual or reformed plant material is arranged in a non-naturalistic way to create new and exciting shape. Plant material is utilized as pure line, form and texture to create new images. **Assemblage** design is influenced by artists Picasso and Braque's early prototypical assemblages which is a 3-dimensional creative, abstract design combining 'disparate found objects' and plant material into a unified whole. The arranger creatively relates the items through his/her unique elements of line, form, colour and texture. **Biedermeier** is a design in which pavé techniques are used to create concentric rings of flowers arranged in a compact rounded or slightly conical shape. The contrast of colour, form and texture creates interest in the design. Beside flowers, berries, leaves, nuts, small vegetables or fruits may be used in the concentric rings. Inspired from the floral cascades of the Art Nouveau period, the design is characterized by a downward, loose-trailing flow of materials, often heavy with foliage representing a cascading waterfall, hence it is named **cascade** (waterfall) design. Plant material flows from the centre of the design out and over the container edges. Long and pliable flowers and foliage such as orchid sprays, *Clematis*, *Asparagus plumosus*, *A. sprengeri*, grasses, vines, ivies, string smilax, yarn, conifers, twigs, metallic thread, small fragments of mirror, feathers, etc. can be incorporated to give the appearance of reflected sunlight off the cascading water. This design combines the geometric form or forms to create a single unit and has a foundation similar to a strong and dominating architectural structure. Developed in the middle of 20<sup>th</sup> century, **creative floral design** refers to designs in which creativity, imagination, and originality are basic. The arranger creates new concepts and forms by combining features from different styles and periods. Bold in form, size and use of colour, having more than one focal point but strong clarity of design with clear space being reflected are the main characteristic features of creative designs. It is a design in two or more containers of the same shape, but different in size or colour, reflecting an **echo** of the bold one. **Floor designs** are typically very tall, bold, dominant and staged directly on the floor. Proportion is the most important element of design. **Framed spatial** is a smallest design organised as a single unit suspended within a frame. It is a light airy design with an unconventional use of plant material combined into a single, unified design, which is then staged within a volume of space defined by a frame. **Free form** design

is a closed silhouette in which outline is free and flowing as an outer periphery of an amoeba and not a geometric shape, with no intersecting or straight lines. Plant material is manipulated by bending or twisting. Negative space is very important, with good asymmetrical balance. The arrangements which do not exceed 12.5 cm in any direction is called the **miniature arrangements**. They can follow any design or style but should be artistic with proper scale and proportion. **Mille fleurs** in French means 'a thousand flowers', and the design is rounded or fan-shaped using different kinds of flowers and colours, arranged in a light, airy fashion in a contemporary vase. New millennium or **modern European arrangements** are distinguished by roundish shape and compactness with an emphasis on texture. Colours may be monochromatic or contrasting. Flowers arranged in natural, casual style, projects that the flowers are casually stuffed in a vase and this is **modern French arrangement**. **Naturalistic designs** are based on nature and capture the essence of a natural landscape scene. The plant material should be of high quality and the entire life cycle of a single flower (often a bulb flower) is represented. The design includes the stem, foliage, buds, blooms and roots in varying stages of development and emphasizes the beauty of the flower. **Panel** is a creative design which includes a panel or panels, plant material and other components. The panels can either be self-supporting or be supported by the other components in the design. **Parallel designs** comprise of three or more units of strong, parallel lines with open (negative) spaces between each unit. These may be horizontal, vertical, oblique or a combination of these having varying heights but in dominating form. **Pavé design** is placing of individual materials closely together to create a flat and jewel-like pattern. This tight clustering style emphasizes contrast, colour and texture. Based on mythology, rebirth and a round symmetrical form are the basis of **phoenix** design. Base is composed of plant material giving traditional and compact look. Overall, it is a radial design with a very little space between the materials. Form, scale and proportion are important elements of this design. A creative design featuring the dominance of the **cylindrical** (tubular, columnar or pillar) form where plant material may be densely packed within the tube and soaring upward, but still echoing the cylinder shape. It is a creative design containing material which reflects an image or light back to the viewer, hence it is called as **reflective design**. These reflective components are integral to the design and must appear throughout the design. **Synergistic**

is the creative design consisting of three or more units, which have a greater impact when viewed together than they would on their own. Although, all the units share the same colours, textures and forms, creating balance, rhythm and harmony, but each unit should not appear as a complete design in itself and therefore there should be some connection among all the units. An **underwater** design must have some or all of its components, including plant material visible under water. All materials in and out of water should appear as a unified design. A clear glass circular container provides the best effect. A properly designed **all-foliage arrangement** can be as attractive and artistic even without using any flower. A drift-wood laden with lichen will make an arrangement very natural. An all-foliage arrangement looks elegant when properly selected foliage of varied colours, shape and forms are used. Tall leaves such as palms, cycas, sansevieria, lilies, pandanus can be combined with dwarf colourful foliage such as alternanthera, chlorophytum, coleus, dracaena, anthurium, calathea, maranta, rex begonia, etc. Colourful leaves of crotons and *Magnolia grandiflora* are also quite suitable for such arrangements. For a cascade arrangement the foliage such as *Pilea muscosa* (*P. microphylla*), *Zebrina pendula* and *Hedera helix* are very useful. A figure or statue of a bird or animal or a natural-looking rock placed at the base of an arrangement can add artistic and natural look to an all foliage arrangement.

## Loose Flower Arrangements

The loose flower-arrangements in the form of garlands and ornaments have been the tradition of India since the time immemorial. Basically the loose flowers were used as flower offerings for gods and goddesses and for decoration in temples. The classic poet Kalidasa, in his famous compilation *Meghaduta*, written during the rule of Chandrapta II (A.D.500), mentions that the women of Alakapuri in monsoon decorated their hairs with *kadamba* flowers, wore *sirisha* flowers (*Albizzia lebbek*) in the ears and carried pink lotuses in their hands. Possibly floral **garland** is one of the oldest and traditional method of using flower for decoration. The use of flower garlands have been mentioned in our oldest manuscripts like Ramayana, Mahabharata and Vedas. Even today, flower garlanding is an important custom in marriages and as a welcome gesture to dignitaries and special guests in Indian culture among all religions and castes. The devotees offer garlands of red *Hibiscus rosa-sinensis*

to goddess Kali and the same is worn by the sage who worship this particular Goddess. Sweet scented flowers are more preferred than others for making garland. The most sought after flowers are *Jaminum auriculatum*, *J. grandiflorum*, *J. officinale*, *J. pubescens*, *J. sambac* and scented *Rosa damascena* and other roses. Other flowers such as *Asclepias*, *Barleria*, *Callistephus chinensis*, chrysanthemum (annual and perennial both), *Centaurea moschata*, *Crossandra*, *Dahlia*, *Dianthus*, *Eranthemum*, *Ervatamia*, *Gaillardia*, *Gardenia lucida*, *Gomphrena*, *Helianthus*, *Hymenocallis*, *Ixora*, *Michelia champaca*, *Mimusops hexandra*, *Nelumbo*, *Nerium*, *Nyctanthes*, *Nymphaea*, *Paeonia*, *Pandanus*, *Polianthes*, *Rudbeckia*, *Scabiosa*, *Tagetes erecta*, *T. patula*, *Thevetia*, etc are widely used as loose flowers and for making garland. Often a flower of lotus or a bunch of lotus is used as the locket of the garland or in between the garland of other flowers. Garlands are either made of only one type of flower or a combination of different flowers. The flowers are held together with the help of a cotton, nylon or a silk thread, inserted in the flowers with the help of a needle. For heavy garlands fine wire stings are used. To make the garlands more gorgeous, in between the flowers threads of jari or silk ribbons are also inserted. Decorative foliage of some ornamental plants such as ferns are used in the garland to improve its look. The central focal point of garland is generally of bright coloured flowers to emphasize its look.

Important **floral ornaments** like bangles and floral crowns were worn by women since old time. Even today, in certain Indian dances, the dancer, especially the female dancers, also wear floral bangles along with garlands. In Maharashtra, the expecting mothers, in a ceremony called 'Shrimanth' are honoured like flower queen with floral ornaments like crown, bangles, necklace, earrings, etc. In West Bengal, a floral crown is also made to be used in ceremonies by the central character, especially during *Annaprasana*, a ceremony when the newborn takes its first cereal food, generally cooked rice, at the age of 6-9 months wearing a floral princess in a drama. The flower most used for this purpose is tuberose. At first a crown shaped strings may be used to make the structure and the flowers may be sewn inside the wires. In the countryside, generally, the frame is made of large leathery leaves, such as jackfruit or *kadamba*, on which the flowers are sewn with the help of cotton thread and needle. Ear-rings and *bajubandhs* made of flowers are also used in ceremonial dances. Heroes and heroines in the drama of various figures such as Rama and Sita wear various floral ornaments. The tribal women even

today, decorate their ears with flowers as earrings and also put on flower ornaments during festivals and celebrations.

The temptation of women to **adorn hairs** with flowers is an age-old custom. This is the tradition followed from ancient times till today with modern styles. Here again, the fragrant flowers get preference over others. However, in certain cities of other countries such as Hawaii and islands of Tahiti, many large flowering perennials such as chrysanthemum, *Cattleya* orchids, carnation, *etc.* are used for hair decoration. Though it is not very common in North India, the tribal women still adorn their hairs with flowers. In whole of South India, especially Andhra Pradesh, Karnataka, Kerala and Tamil Nadu, the women adorn their hairs with jasmine flowers. In our country, *Veni*, *gajra* and *broach* are the variations available in flower arrangements for hair styles specially for specific occasions (Singh and Dhaduk, 2006). These are very well accepted in today's modern age and preferred by the women. These special kind of flower arrangements are widely used by the *Bharat Natyam* and *Kuchipudi* dance recitals for hair ornaments (Manivannan, 2012). The **veni** is single or multiple rows or chain of flowers bunched into one unit or as loose multiple flower strings, which is applied on long open hairs or plaits (*choti*). These flower chains are nothing but mini-garlands prepared by piercing flowers with needle and thread. Generally, fragrant white flowers like jasmine and tuberose are used. In South India, *Barleria* and *Crossandra veni* is very popular. **Gajra** is wider, circular and firm form of *veni*. *Gajra* making requires proper skill of flower weaving with needle and thread. It needs proper arrangement and combination of other flowers to give a decorative form. The *gajras* are made out of a single fragrant species of flowers such as jasmine, *Michelia champaca* and tuberose, however, now *crossandra* and *barleria* or mixture of flowers and decorative foliage have got place in this venture. Mostly white coloured fragrant flowers are preferred and to add design and appearance rose flowers or petals are also woven along. Several decorative materials such as *jari* or silk strings or threads may be used to make the *gajra* more gorgeous. **Broach** is a hair decoration flower arrangement similar to *veni*. It is rather a combination of *veni* and *gajra*. It is prepared using thin wire by spirally and tightly turning around the flower bud pedicel. The merit of broach over *veni* and *gajra* is that it can be made into any shape as desired and after preparing also it can be turned to give any shape. It is sold at a very high price, ranging from Rs. 100 to Rs. 2,000, depending upon size and design. Broach provides

most stylish and modern look to the flower decoration. These have good demand during marriage ceremonies. For *broach* making buds of *Ervatamia*, *J. arborescens*, *J. auriculatum*, *J. grandiflorum*, *J. officinale*, *J. sambac* and single *Polianthes tuberosa* are used. Petals of rose are also woven to provide excellent designer look.

The custom of **rangoli** has a religious connotation and is done during *puja* (prayer offerings) in front of temples or in some social functions such as marriage, and at various festivals in front of the gate of the house. A colourful 2-dimensional display in an attractive design, geometrical or otherwise, is referred to as *rangoli*. *Rangoli* drawing with the help of dry colour or a coloured paste on the floor, is a common practice especially among the Hindus in India. *Rangoli* when done with flowers add life and grace to the beautiful display. For making *rangoli*, a selected design is drawn on the ground, followed by arranging of whole flowers or petals and foliage with proper colour combination according to the design (Singh, 2013). As per the designer's choice and creativity, a wide range of flowers and petals can be used for *rangoli* making. Flowers of varied colours such as bougainvillea bracts, jasmine, gaillardia, marigold, amaranthus, cock'scomb, rose, chrysanthemum, aster, plumeria, *etc.* give wonderful effect to the floral *rangoli*. Beside flowers, fruits like jamun, ber, fig, sapota, grapes also look wonderful when used in proper design. Even vegetables like cauliflower, okra, peas, beans etc can be used in proper way. Various patterns are used for making *rangolis*, in design that may be traditional and geometrical, floral, sceneries depicting nature or rural life, thematic designs for specific occasions or festive seasons. Specific fragrant *rangoli* and floating water *rangoli* can also be created. Fragrant *rangoli* also has air-freshening effects. It is created by using fragrant flowers such as jasmine, roses, frangipani, champa, gardenia, *etc.* Even few drops of citronella oil can be added, this will keep away the mosquitoes. Water *rangoli* looks very graceful, elegant and soothing to the eyes and at the same time is very simple and less time consuming. Flowers are made to float on the water surface in a desired pattern. Floating candles and *diyas* when combined, add more charm to the floating floral *rangoli* especially during Deepawali. Small coloured stones and shells can be placed at the bottom of the large sized urn or bowl that is selected as the container for holding water. Rose, asters and chrysanthemums give a wonderful effect to the water floral *rangoli*. Jasmine, gerbera, rose, frangipani, gaillardia, *etc.* can also be used.

## References

- Aaronson Marian, 1983. *The Art of Flower Arranging*. Grower Books, London, UK.
- Aaronson Marian, 1984. *Flowers in the Modern Manner*. Grower Books, London, UK.
- Ascher, A. A. 1974. *The Complete Flower Arranger*. Simon and Schuster, New York, USA.
- Berrall, J.S. 1997. *A History of Flower Arrangement*. The Saint Austin Press, London, UK.
- Blacklock, J. 2006. *The Judith Blacklock Encyclopedia of Flower Design*. The Flower Press Ltd, Bournemouth, UK.
- Care, R. E. 1961. Japanese Floral Art: Symbolism, Cult and Practice. D. Van Nostrand Co., Princeton, New Jersey, USA.
- Curtis, C.D. 2004. *Contemporary Floral Design*. The National Association of Flower Arrangement Societies, London, UK.
- Ekman P and R. Davidson, 1994. *The Nature of Emotion*. Oxford University Press, N. Y., USA.
- Griner, C. 2011. *The History of Floral Design*. In: *Floriculture: Designing & Merchandising* (3rd ed.). Delmar Thomson Learning, Albany, USA.
- Gupta, V. 2012. Ikebana: The Concept. In Compendium 'National Workshop on Floral Craft: The Art and Technique for Value Addition in Flowers', pp. 131-132, organized at NAU, Navsari, 12-13 April, 2012.
- Hannay Frances, J. 1948. *Period Flower Arrangements*. National Council Books, Inc. Philadelphia, PA, USA.
- Havililand Jones, J., H. Rosario, P. Wilson and T. McGuire, 2005. An Environmental Approach to Positive Emotion: Flowers. *Evolutionary Psychology*, **3**: 104-132
- Healey, D. 1986. *The New Art of Flower Design*. Villard Books, New York, USA.
- Hiller, F.B. 1974. *Basic Guide to Flower Arranging*. McGraw-Hill Book Co., New York, USA.
- Komoda, S. and H. Pointer, 1984. *Ikebana-Spirit and Technique*. Blandford Press Ltd, Poole, New York, USA.
- Larmie, W. E. 1980. *Flower Arranging Basics to Advanced Design*. Prentice Hall, New Jersey, USA.
- Mastekaasa, A. 1992. Marriage and psychological well-being: Some evidence on selection into marriage. *J. Marriage and Family*, **54**(4): 901-911.
- McDaniel, G. L. 1996. *Floral Design and Arrangement*. Prentice Hall Company, Virginia, USA.
- Manivannan, K. 2012. Traditional Floral Crafts of South India. In Compendium, 'National Workshop on Floral Craft- The Art and Technique for Value Addition in Flowers', pp. 136-138, organized at NAU, Navsari, on April 12-13, 2012.
- Miller, M.S. 1981. *New Dimensions in Floral Design*. Wegferd Publications, North Bend, OR, USA.
- Packer, J. 1998. *The Complete Guide to Flower Arrangement*. D.K.Pub., Inc, New York Press, USA.
- Singh, A. 2013. Fresh Flower Arrangement: A Hidden Inspiration to Creative Work. *Floriculture Today*, October 2013, pp. 27-32. Media Today, New Delhi.
- Singh A and B.K. Dhaduk, 2006. The Textbook of Bonsai and Flower Arrangement. A publication by ASPEE College of Horticulture and Forestry, NAU, Navsari.
- Singh A and B.K. Dhaduk, 2011. Floral Craft: A Profitable Business. In Souvenir: 'National Conference on Recent Trends and Future Prospects in Floriculture', organized by ISOH, at SVP University of Agriculture and technology, Meerut on 5-8 March, 2011.
- Singh A and B.K. Dhaduk, 2012. Impact of Flowers on Human Life: A Journey Revealed. In: Compendium, 'National Workshop on Floral Craft: The Art and Technique for Value Addition in Flowers', pp. 1-5, organized at NAU, Navsari, on 12-13 April, 2012.
- Singh, A. and P. Kumar, 2007. Flower Arrangement: The Art and Technique. *Floriculture Today*, **11**(10): 22-27. Media Today, New Delhi.
- Westland, P. 1992. *The Complete Flower Arranger*. Ultimate Editions. Annes Publishing Ltd., U.K.