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Survey of Some Important Ornamental Flowering Plants of Solan, Himachal Pradesh with Enumeration

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ABSTRACT: The paper documents the knowledge of some important ornamental flowering plants of Solan, Himachal Pradesh. In the present investigation, seasonal trips were made to collect the plants from different sites of district Solan, Himachal Pradesh. The ornamental flowering plants were observed and some of the plants with medicinal as well as ornamental importance were selected. Proper field note of each specimen was recorded and their identification was done by giving botanical name, local name, parts used, habitat and general morphology. Fifteen ornamentally important plant species belonging to 15 genera and 11 families were studied. The purpose of study is to explore and document the important plant species as they play a vital role in decorative purposes, perfume industries and as well as in the field of medicines.

Keywords: Ornamental flowering plants; Solan, Himachal Pradesh; Economic and Medicinal Importance..

INTRODUCTION: Since the beginning of life, plants have served humankind as source of fuel, food, clothing, shelter and medicine. Plants contain numerous chemicals as a result of their natural metabolic activities. These chemicals may be essential for plant growth or as byproducts of its metabolism; they may also be potentially useful as food or as medicine[1]. The plants are grown for the display of their flowers but in many cases ornamental features include leaves, fruit, stem and bark. The estimated area under the flowers crop in the country is about 1.06 hectare[2].

The scent of flowers in particular awakens our senses. We associate relaxing, calmness, delicacy, harmony, heart opening, love and sensuality with it. Traditionally flowers are grown for aesthetic, social function and extraction of essential oils and manufacturing of perfumes[3]. The bulk of the flowers are used as such in garlands and decorative bunches for religious offerings and a small quantity for the production of oils and attars. The essential oil in flowers is extract through effleurage which is widely used for production of Jasmine attars in India[4]. A member of family Iridaceae, *Gladiolus*, is globally cultivated commercially for ornamental and medicinal purposes[5,6].

Flowers for the use in daily life are produced for the decorations in festivals of both rooms and guests, for important ceremonial presentations, for needs of personal cleanliness, for the decoration of tombs and finally for the religious sacrifices and funerals. The ornamental plants also plays an equally important part in cleansing urban air, cooling the atmosphere around us and assisting with use and recycling of vital essential elements in the soils, providing nutrition to bacteria, fungi and microorganisms living in the soils. These plants also play crucial role in cooling the atmosphere through the evapo-transpiration process on their leaves and other parts thereby preventing health hazards[7]. Aquccah[8] reported that in many societies some flowers are associated with specific events. The preservation of the flower lies in its strong power to alleviate human sorrow and uplift our physiological well being which is closely linked to our health. The wide biodiversity in flowers *viz.* shape, size, type, colours and divine fragrances help us combat stress, sooth the pain, help us forget for moments all the bad and scary things this world presents us with on a daily basis.

Due to large demand of flowers, cultivation of ornamental plants has received an impetus in the recent years. So, the enhancement of growth and flowers production of such plants is desirable.

MATERIAL AND METHODS: It has become necessary to enhance the biomass production and quality of ornamental plants in order to fulfil the need of society. Therefore, it requires formulation of planning and strategies for their conservation and enhancement of their products.

Study site: The study was undertaken at different sites located in Solan district, Himachal Pradesh. Solan is located at 30.92^0 N, 77.12^0 E and has a geographical area 1936 sq.km. The climate of the area is generally sub- temperate, semi- humid characterized by cold winter with mild summer and moderate rainfall.

Survey: Different sites and localities of district Solan were visited during the course of investigation. Fifteen ornamental plants of economic importance were surveyed from different sites. The purpose of the survey was to collect information of some ornamental flowering plants with proper field notes, identification of the plants by giving botanical name, common name, locality, economic importance and general morphology. The photography of all flowering plants was done.

RESULTS AND DISCUSSION: Floriculture could be considered as the most colourful sector of horticulture. India is the second largest grower of flowers after China. With urbanization and increase in disposable income level, the demand for floriculture products has increased significantly. As a result, there has been an increasing demand for cut flowers like Rose, Gladiolus, Gerbera, Orchid, Carnation, Lily etc. There is an equally good demand for the traditional flowers like *Jasminum grandiflorum*, *Tagetes patula*, *Chrysanthemum* sp., *Rosa indica* etc. This has led to the transformation of floriculture sector from household activity to a commercial venture. It is one of the fastest growing segments of horticulture having potential for providing enhanced returns to the farmers besides providing employment opportunities to the unemployed youth.

Colourful Flowers of Himachal Pradesh and the beauty of big and small blooms is a treat to any plant lover. Himachal Pradesh has a wonderful cold climate that supports growth of flowering plants. Survey of different sites and localities of district Solan, Himachal Pradesh was carried out for the collection information of ornamental flowering plants. The study provides information of fifteen plant species belonging to eleven families (Table I). Among all the families, Asteraceae was found to be dominant followed by Apocyanaceae. Fourteen species and ten families belonged to dicot group while one genera, one species and one family belonged to monocot group. The selected ornamental flowering plants have both ornamental as well as medicinal importance. The highly used parts of the plants were roots, leaves, flowers, stalks, corms, oil and dried rhizome. In some cases, whole plant was claimed for the cure of many ailments. Different types of preparations made from medicinally important species included juice, oil, decoction and paste. The present survey also provides a brief account of the use of various flowering plants against diseases like colds, fevers, headaches, eye inflammations, hypertension, skin disease, coughs, pulmonary infections, rheumatis, diabetes and malaria etc. It is also evident that a few flowers like *Crysanthemum leucanthemum*, *Dahlia variablis*, *Gladiolus grandiflorus*, *Lilium rubescens*, *Nerium indicum* and *Rosa indica* play a vital role in decorative purposes, perfume industries and are regular constituents of several medicines. Floriculture has been identified as a potential business due to divergence of farmers towards high value floral crops and utilization of flowers at social and industrial level[9]. The results in the present investigation are also constant with the reports of George *et al.*[10] who studied the properties and uses of different trees and ornamental plants. Viability and resource use in ornamental plants nursery business in Nigeria has also been studied by Segun *et al*.[11]. Our results are also in corfirmity with the findings of Reddy *et al.*[12] who explored the ornamental flowering species of Ysr district of Andhra Pradesh. Ornamental species are also the source of medicinal importance[13]. A recent trend in order to establish ecofriendly human habitat is the landscape gardening and bioaesthetic planning.

Table 1: Studies on some important ornamental flowering plants.

Sr. No.	Botanical Name	Common Name	Family	Parts Used	Habitat and General Morphology	Economic Importance
1.	*Aster amellus* Linn.	Michaelmas daisy	Asteraceae	Roots	*Aster amellus* are native of Italy. The plants do better at medium and high elevations. Single flowers are small, daisy like, borne in large heads and white, deep blue or pink in colour.	The roots are anti-inflammatory, depurative, haemostatic and pectoral. They are used in the treatment of coughs, pulmonary infections and malaria.
2.	*Catharanthus roseus* (Linn.) G.Donn. *(Vinca rosea)*	Periwinkle	Apocynaceae	Whole dried plant	The plants are 30-60cm. tall and covered with bright green smooth oblong leaves. The flowers are rosy purple. The plants are free flowering and bloom around the year.	It is used for circulatory discorders and support for the metabolism of brain. Some anticancer drugs (Vincristine / Vinblastine)

						extracted from the plant.
3.	*Chrysanthemum leucanthemum* Linn.	Moon daisy	Asteraceae	Seeds, aerial parts	Plants are hardly perennials attaining the height of up to 0.5m. They are summer flowering plants. The flowers have white rays and yellow disc florets.	Extract of plants have been shown to have a wide variety of potential medicinal properties including anti HIV-1, antibacterial and antimycotic.
4.	*Dahlia variablis* (Willd.) Desf.	Dahlia	Asteraceae	Flowers, tubers	Plants are tuberous rooted succulent stemmed perennials. Flowers heads are produced terminally and in the upper leaf axils of shoots. They have colourful ray florets and yellow disc florets.	The petals of the dahlia as well as its tuber are used in skin treatments for rashes, infected grazes and cracks in the skin.
5.	*Pelargonium hortorum* Bailey	Geranium	Geranaceae	Aerial part	It is an annual herb that can be found in disturbed areas in Western region, such as roadsides, lawns, and logged areas. It has pink to purple five-petal flowers borne in loose clusters.	This plant is used rarely in herbal medicine but seems to have good astringent qualities making it useful in baths and facials. Scented *Geraniums* are used for aromatherapy.
6.	*Gladiolus grandiflorus* Andrews.	Sword lily	Iridaceae	Blubs, corm	Plants are corm produced herbs that are grown as annuals. The flower ranges in colour from pure white to crimson red and deep violet with a wide range of shades in between.	Plant is used in treating a variety of ailments including diarrhoea and colds. It is often prescribed as a booster for patients with low energy levels and for hypochondriacs.
7.	*Hibiscus rosa sinensis* Linn.	China rose	Malvaceae	Leaves, flower, roots	A large 1-2 m. tall, bushy shrub having numerous branches. The broadly ovate sharp toothed green leaves are ornamental.	Leaves and flowers are good for healing ulcers and for promoting growth and colour of hair. The roots are used to make various decoctions for cough, hair loss and hair greying.
8.	*Hydrangea paniculata* Raf.	Panicle hydrangea	Saxifragaceae	Fresh roots, Dried rhizome	A group of shrubs which can be cultivated successfully at medium and high altitude. The leaf is handsome, large, oval to roundish in shape and toothed at margins.	It is one of the best herbal remedies for treatment of pain related to kidney stones by reducing the size of the stones and allowing them to pass painlessly.
9.	*Jacobinea carnea* (Lindl.) G. Nicholson	Flamingo flower	Acanthaceae	Leaves,	A sub- shrub with long, sometimes 30 cm. long, lanceolate leaves. The carmine coloured flowers are long, the lower lip recurved.	It is used to treat colds, coughs, chronic bronchitis, hectic fever, gonorrhoea and opthalmia. Honey produced from this plant is said to be a powerful expectorant and antispasmodic.
10.	*Lilium rubescens* S.Watson.	Lily	Liliaceae	Bulbs	*Lilium* are found naturalized in the temperate zones of Asia and Europe. This is a perennial herb growing a waxy erect stem up to two meters in height. The inflorescence bears up to 40 erect lily flowers.	It is also used in medicine as the powder from dried bulbs is used as water disinfectant and applied on wounds to stop bleeding.
11.	*Nerium indicum* Mill.	Sweet scented	Apocynaceae	Seeds, bark	One of the most popular grown shrubs in India, especially in the Northern parts. A spreading bushy shrub in which a number of canes like stems arise from ground level and attain a height of 2.5 to 4 m.	It is used traditionally as a folk remedy for a wide variety of maladies and conditions including dermatitis, abscesses, eczema, sores, warts, corns, ringworm, scabies, herpes, skin cancer, asthma etc.
12.	*Rosa indica* Linn.	Rose	Rosaceae	Flowers, buds	A rose is a perennial flower shrub. The species form a group of erect shrubs and climbing or trailing plants	Flowers are used in cosmetic industries for making perfume and rose water. Buds

					with stems that are often armed with sharp prickles. Most are native to Asia.	and petals are used for the removal of gal bladder and kidney stones. Flowers are use against asthma.
13.	*Salvia splendens* (Linn.) Ker-Gawal.	Scarlet sage	Labiatae	Leaves	Plants are grown as annuals and like a rich soil. The plants may be tall (60-90 cm.) or dwarf (20-30 cm.) and bushy. The long terminal spikes with their tubular bright scarlet flowers are borne above the foliage.	The ancient Greeks used it to treat ulcers, consumption and snake bites. It is used as a cold tea to stop sweating while the same tea drunk hot produces sweating.
14.	*Senecio cineraria* (Willd.) Arcang.	Cineraria	Compositae	Whole plant	*Senecio cineraria* are an annual species. The large dark green heart shaped leaves are most attractive. Plants grown to the height of 30- 60 cm and the daisy like brightly coloured flowers are borne in clusters.	It was formerly much used for poultices and reckoned well for sickness of the stomach. A weak infusion of the plant is now sometimes given as a simple and easy purgative and a strong infusion as an emetic.
15.	*Tagetes patula* Linn.	Genda phool	Asteraceae	Whole plant	*Tagetes patula* is an annual species. They are popular potted plants. The flowers are smaller than those of African marigold. The ray florets may be coloured orange or maroon red and the flowers head are less compact than that of the other species.	The flower produces food colouring which is used in poultry in order to intensity the colour of skin and yolk. The plant is also known for antioxidant activities and used for the treatment of eyes.

PLATE - I

Aster amellus

Chrysanthemum leucanthemum

Catharanthus roseus

Dahlia variablis

Pelargonium hortorum

Hydrangea paniculata

PLATE - II.

Gladiolus grandiflorus

Lilium rubescens

Hibiscus rosa sinensis

Nerium indicum

Jacobinea carnea

Senecio cineraria

Rosa indica

Tagetes patula

Salvia splendens

CONCLUSION: Ornamentals are produced mainly for their aesthetic value, thus the propagation and improvement of quality attributes such as leaf types, flower colour, fragrance, longevity and form, shape and architecture and the creation of novel variation are important economic goals for the ornamental industries. Conservation of ornamental flowering species is also one of the alternate methods to maintain their diversity. In the development of new hybrids, polyploids and mutation of ornamental interest, it is essential to know wild ornamental species. The dynamic floriculture industry is constantly looking for new products, technologies and market niches. This process is largely based on research and development and requires strong collaboration between many links of the production chain.

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