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Studies of Different Methods on Drying of Flowers

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ABSTRACT

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During the year 2022, an experiment was conducted at the Lovely Professional University, Phagwara-144411, Punjab, to investigate the effect of different drying methods on the dry flower quality. Natural materials such as dry flowers and their parts have become the most popular option of the public for interior décor in the current era of eco-consciousness. In comparison to fresh cut flowers and other living plants, the dry flower industry is predicted to contribute significantly to the country's economy in the future. The flowers were dried using a variety of methods. Flower colours have a considerable impact on the fresh and dried weight of flowers. Different colours and appearances of flowers, as well as the drying procedures utilised, resulted in significant variances. The scattered information and data on drying of flowers and other decorative plant parts is assembled in this review, which will be valuable for future research. This may eventually be useful in attracting the attention of researchers and scientists to work on it, in addition to the entrepreneurs who would immediately benefit from the knowledge review presented in this paper.

Introduction

A flower is a unique feature of a plant. Flowers are sometimes known as a plant's bloom or blossom. Flowers have a special place in every occasion because of their range of colours and fragrances that make the air pleasant to breathe.

A flower is the most colourful element of any plant, and it looks like a world decoration. Flowers represent love, respect, friendship, beauty and admiration. Fresh flowers make up a significant

portion, however due to their short shelf life; they are only acceptable for a limited time. As a result, drying processes are critical in keeping flowers looking fresh for several days. Dried flowers have a lot of potential as a commercial substitute for fresh flowers. Press drying, air drying, desiccant drying, microwave drying, and hot air oven drying are the most prevalent ways of flower drying.

Microbial activity is diminished and the flowerages as a result of drying. These dried flowers can be stored for longer periods of time without losing their

look or ornamental value due to the lack of moisture. Different sorts of drying techniques have been developed, allowing flowers to keep their fresh appearance for several years.

Dry floral crafts have been utilised for the sake of beautifying for a long time. Dry flowers have a well-established market all over the world, but they have yet to gain the exposure needed for commercial exploitation in India. There are numerous business opportunities in this industry, including floral décor for homes and businesses, bouquets, loose flower crafts such as dry flower glass frames, potpourri and so on. These dried arrangements retain the line, texture, and colour of the flowers, allowing for a balanced aesthetic for formal or informal settings. Crafting demands a minimal initial investment and a significant return on investment, as work completed with innovative and artistic talents provides aesthetic delight to the eyes.

History

Drying flowers for preservation and other purposes has been practiced since ancient times. The Egyptians used dried flowers to make perfumes and placed them in tombs. Dried flowers were used as medicine in the middle ages, and they served as the foundation for an art form in Japan.

Economic Importance

The dry flower industry in India is worth Rs. 100 crores, and such dry decorative materials are globally recognised as natural, eco-friendly, long lasting, and inexpensive. India is a major exporter of dried flowers, accounting for 5% of global dry flower trade. This industry is growing at a rate of 15% per year. Potpourri is a significant segment of the dry flower industry in India, with a market value of Rs.55 crores.

The easy and year-round availability of a diverse range of raw materials from forests, as well as the availability of labour for labor-intensive craft production, are driving factors in the development of

India's dry flower industry. This industry employs approximately 15,000 people directly and approximately 60,000 people indirectly.

Indian states with dry flower industry potential; currently, India is a leading exporter of dry flower to the global market. Western Europe, the United States, Japan, Singapore, and Hong Kong are the top importers of the country's dry flower products.

The two major states where the industry has grown steadily are West Bengal and Tamil Nadu. Because of their rich biodiversity in terms of topography and climate, these states have become a rich source of plant materials for the dried flower industry.

Methods of Drying

Air drying

This technique is simple and requires no equipment to achieve a clean look for bouquets. This is known as the 'hang and dry' method. The flower and its stem should be tied together and hung bottom up.

The environment should be dark, warm, and well-aerated, with low humidity. It is the oldest and longest method. It takes at least three weeks to completely dry. Furthermore, bunches of flowers are hung upside down in a row; they add beauty to the decor during the hanging process. Flowers selected for air drying should be slightly immature.

Embedded Drying

This method employs an anhydrous desiccant, which means that the drying agent has a high affinity for water. In a plastic container, a flower is embedded in a desiccant such as sand or silica gel. Shrinkage occurs as a result of moisture loss in air drying, and the morphology of ornamental flowers changes. The advantage of this method is that the shape is unaltered, retaining its natural form. This is perfect for delicate flowers such as dahlias, carnations, and roses. Other agents such as perlite, borax, and sawdust can be used as well.

Press Drying

It is the simple practice of applying pressure to foliage or flowers to remove moisture while retaining colour and structure. There are several methods for applying pressure to keep material in blotting paper under books, or even in a newspaper; or with plant press equipment. The plant press is intended to flatten the samples. This technique was first used in 1820, but it was later used for herbarium preparation.

Hotair Ovendrying

It is the best technique because it takes very little time. It is the quickest method, and depending on the size of the flower, it usually takes 20-25 minutes to dry. The principle behind the technique is the discharge of moisture by unsettling water molecules present in the material using a microwave. Temperature is the most important factor.

Plant Description

Carnation (*Dianthus caryophyllus* L.), also known as the divine flower or "flower of the Gods," is one of the world's most important cut flowers.

Dianthus caryophyllus

Dianthus caryophyllus is a herbaceous perennial plant that can reach a height of 80cm. The flowers appear singly or in groups of up to five in a cyme; they are 3–5 cm in diameter and sweetly scented; the original natural flower colour is bright pinkish-purple, but cultivars of other colours, including red, white, yellow, blue, and green, as well as some white with coloured striped variations, have been developed. The fragrant, hermaphrodite flowers are symmetrical.

Hibiscus rosa-sinensis

Hibiscus rosa-sinensis is a bushy, ever green shrub or small tree that grows 2.5–5 m (8–16 ft) tall and 1.5–3 m (5–10 ft) wide in summer and autumn, with

glossy leaves and solitary, brilliant red flowers. The five-petaled flowers are 10 cm (4 in) across and have orange-tipped red anthers. Flowers in cultivars and hybrids range from white to pink, orange, peach, yellow, and purple, in addition to red.

Accroclinium

Accroclinium, also known as sunray or pink paper daisy, is a genus of Australian plants in the Gnaphalieae tribe of the Asteraceae family.

Materials and Methods

Materials required for embedded drying of carnation

Carnation flowers: 4nos.

Plastic containers: 2nos.

Spatula: 1 no.

Knife

Silica gel

Borax powder

Procedure of embedded drying of carnation

The experiment was carried out at Lovely Professional University's Department of Agriculture in Phagwara. Four different Carnation flowers (white) were chosen for this study. The flowers were dried using various techniques, including embedded (silicagel and borax powder) drying. Carnation flowers that were healthy and disease-free were harvested commercially in the morning hours.

The cut ends of the flower stalks were placed in water immediately after harvest. The stem length of each flower was kept consistent.

As embedding media, sand, borax, silica gel, sawdust, perlite, and combinations of these are used.

Sand and borax are the cheapest, but they take longer to dry. Silica gel is an excellent drying agent for delicate flowers such as roses, dahlias, and carnations (Prasad *et al.*, 1997).

The desiccant method for delicate flowers may fall apart when air dried. Desiccants such as borax and silica gel have been found to be the most effective.

Materials required for press drying of china rose

China roses

Blotting paper

Heavy books

Procedure of press drying of china rose

Flowers from China rose plant are used in this experiment. Picking of the flowers should be after it blooms, and the flower should be in perfect condition. It should be made sure that plant is not wet, and the flower is in good condition. Cover the flower with blotting paper from both sides, as shown in the photo, and place some heavy objects on it.

For this purpose, heavy books are used, and the blotting paper is changed every week for 4-5 weeks.

Materials required for press drying of paper flowers

Paper flowers

Knife

Thread

Procedure of press drying of paper flowers

Step1: Collect 10-12 flowers with long stem and then cut the stem of the flowers.

Step 2: After cutting the stem of the flowers, they were all tied together by thread.

Step3: After that all the flowers were hanged by a Thread.

Step 4: After tying all the flowers together, I hanged them for air drying in the room under normal temperature.

Results and Discussion

Fig.1 and Fig.2 shows the different steps/stages used in embedded drying using silicagel and borax powder respectively.

Time required to dry carnation flowers using various drying procedures. The drying of white carnation flowers using silica gel and borax powder took 32 and 35 days, respectively. The data shows how different drying procedures affect the fresh and dry weight of selected carnation flowers. Flower colour had a considerable impact on the fresh and dried weight of carnation flowers.

Fig.3. shows the procedure and changes observed in press drying of china rose.

The changes observed areas follows:

Colour is changed to dark red.

No moisture is present in flowers.

Flower is pressed very well.

Weight is decreased.

Flower looks to be very light in weight, dark colour and no moisture.

Fig.4. shows the procedure and changes observed in air drying of *Accroclinium*. The changes observed are as follows:

No moisture is present in flowers.

Flowers are dried very well.

Weight loss can be observed.

Fig.1



Fig.2 Different stages of silica gel drying



Fig.3 Different stages of borax powder drying



Fig.4 Press drying of Chinarose



Fig.5 Air drying of *Accroclinium*



The study's main goal was to standardise the various drying techniques for different flowers.

According to the findings of this study of embedded drying, the silica gel drying technique takes less time to completely dry carnations than other drying techniques. The silica gel drying technique resulted in the greatest moisture loss, while the borax powder drying technique resulted in the least moisture loss.

Because of the different carnation flowers and drying techniques used, the colour and appearance of dried carnation flowers varied significantly, with the shape of the dried flowers. It was also observed that the silica gel drying technique produced the best results for preserving quality parameters such as colour, shape, and appearance of carnation flowers. Various flowers were used in the experiment to dry the flowers using the press and air drying method.

Hibiscus rosasinensis and *Accroclinium* has high percentage of drying, the process was simple, and the results were excellent. I discovered that the flower's size and weight decreased. Some of the flowers lose its ornamental value after drying.

The moisture content in the blooms after drying influences flower shape. Flowers with lower moisture content have more rigidity and consistent cell contraction, whereas dried flowers have higher moisture content, resulting in flaccid flowers.

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