

Hydrangea: A Beautiful Shrub for Landscaping and Commercial Floriculture

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From Easter season to Mother's Day, hydrangeas are highly sought-after by retail florists and garden centers. Their large, globe-shaped clusters of flowers exude a unique regal elegance uncommon among potted plants. Many gardeners view hydrangeas as the chameleons of the plant world as in acidic soil with a pH below 6, hydrangea flowers turn blue in colour and in alkaline soil with a pH above 7, their flowers will appear pink or even red. Whereas, in neutral to slightly acidic soil, hydrangeas can produce purple blooms, or even display a mix of pink and blue flowers on the same plant (as seen in figure 1 and 2).

Hydrangea belongs to the plant family **Hydrangeaceae** and comprises almost 75 species of shrubs or small trees, most of which are native to the regions of China, Korea, and Japan. The name "hydrangea" comes from the Greek words "hydro," meaning "water," and "angeion," meaning "vessel" (Murzabulatova *et al.*, 2023)

Meaning of Hydrangea

Hydrangeas in Japan are thought to symbolize gratitude or apology. In ancient times, the Japanese emperor would give hydrangeas as apologies to maidens. Additionally, presenting a bouquet of hydrangeas is often seen as a gesture of heartfelt gratitude for the recipient's understanding. These flowers are also sometimes associated with honesty. In modern culture, the meaning of hydrangeas varies based on their color. **Pink** hydrangeas represent love and sincere emotions, often likened to a beating heart. **Blue** hydrangeas signify forgiveness, rejection, and regret. **White** hydrangeas symbolize purity, grace, abundance, and sometimes bragging. **Purple** hydrangeas denote abundance, wealth, and royalty.



Fig 1- Flowers in Pink colour



Fig 2- Flowers in Blue colour

Morphology

Hydrangea is a genus of deciduous and evergreen shrubs or woody climbers that originate from Mexico. It comprises 25 species of resilient plants that can reach a height of up to 1.5 meters in medium and high-altitude areas. Their flowers can grow in two types of arrangements: **corymbs** or **panicles**, typically found at the ends of the stems. These flowerheads generally consist of two types of flowers: small, inconspicuous ones in the center or interior, and large, showy ones with vibrant sepals on the outside (Mandelbrot, 2002). These striking flowers often form a ring around or extend outward from the small central flowers. In wild populations, plants usually have few or no showy flowers, whereas cultivated hydrangeas have been bred and selected for their larger, more prominent blooms (Hufford L., 2001).

Uses of Hydrangea

- ❖ Hydrangeas can be planted in rows to create beautiful, flowering borders and hedges that add privacy and structure to a garden.
- ❖ Smaller hydrangea varieties can be grown in pots or containers, making them suitable for patios, balconies, and other small outdoor spaces
- ❖ Hydrangeas are popular for floral arrangements, both fresh and dried, due to their large, long-lasting blooms (Fig 3).
- ❖ Apart from their decorative use in gardens and bouquets, hydrangea roots and rhizomes have been utilized for treating urinary tract conditions and are recognized for their diuretic properties in the Physician's Desk Reference (PDR) for Herbal Medicine.
- ❖ However, hydrangeas are considered moderately toxic if ingested, as all parts of the plant contain cyanogenic glycosides.
- ❖ The leaves are safe to consume and contain phyllodulcin, a substance that imparts a sweet taste. Therefore, "**ama-cha**" translates to "**sweet tea**" (Rinehart *et al.*, 2006)

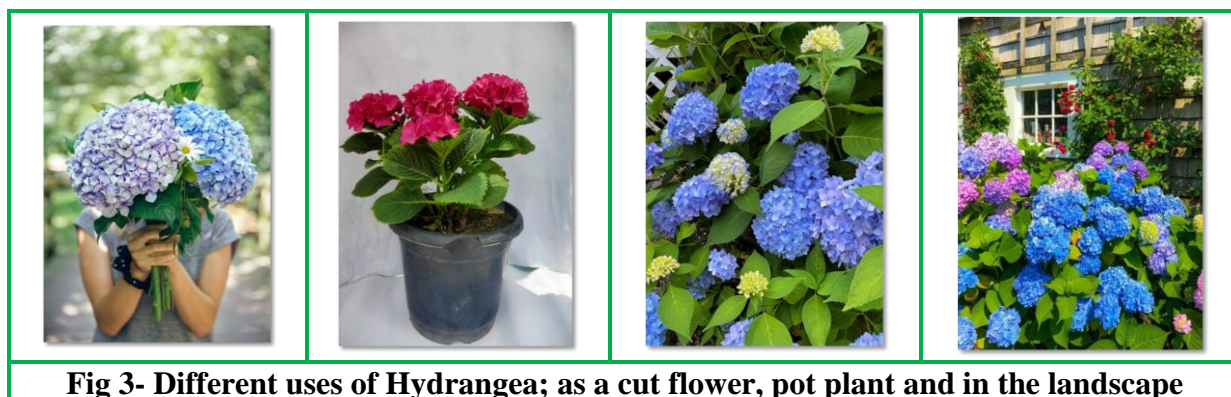


Fig 3- Different uses of Hydrangea; as a cut flower, pot plant and in the landscape

Types of Hydrangea

- ❖ *Hydrangea anomala*: The climbing hydrangea is a deciduous vine and originated from Asia. It can climb up to 60 feet using clinging aerial rootlets but will grow shrubby and sprawling without support. The leaves are green, rounded, heart-shaped, and range from three to six inches long (as seen in Fig 4). Mature plants produce short flowering branches adorned with flat white flowers. As the plant ages, it becomes woody (Pecchioli *et al.*, 2011). Overly vigorous growth should be pruned only after the vine is well-established and climbing. To rejuvenate, cut back to the framework late in the dormant season



Fig 4- *Hydrangea anomala*

❖ *Hydrangea arborescens*: It is a deciduous shrub. It grows upright and dense, reaching five feet in both height and width. The leaves are oval and grayish-green, measuring three to six inches long. The flowers can be white, pink, or green. In the basic species, most of the flowers in a cluster are fertile, with only a few sterile ones, which are not sufficient for a full lace-cap effect



Fig 5- *Hydrangea arborescens*

❖ (as seen in Fig 5). The 'Annabelle' variety is much showier, producing enormous globular clusters of sterile flowers up to one foot in diameter on a plant that grows about four feet tall and wide. 'Grandiflora' is another variety that reaches four feet in height, with flower clusters six inches across. Prune in late winter, as hard pruning results in larger flowers (Huang *et al.*, 2023).

❖ *Hydrangea macrophylla* (syn. *Hydrangea hortensia*, *Hydrangea opuloides*): The French hydrangea, also known as big leaf hydrangea, is a deciduous shrub native to Asia. It has a symmetrical, rounded growth habit and typically reaches three to six feet in height and width, though it can grow taller. The leaves are thick, shiny, and coarsely toothed, measuring up to six inches long. It produces large clusters of flowers that can be white, pink, or blue (as seen in fig 6). This hydrangea thrives in areas with relatively mild winters, but it can be disappointing in regions where plants freeze to the ground each year, as they may never bloom under these conditions due to flower buds forming on old wood. In colder zones, protect the plant by mounding soil or leaves over its base. Pruning should be done immediately after blooming (Runger 2019).



Fig. 6- *Hydrangea macrophylla*

Propagation

Propagating hydrangeas through softwood cuttings is a popular and effective method. Firstly, choose a healthy, flexible stem from the current season's growth, avoiding woody stems. With clean, sharp pruners, cut a 4-6 inch section from the tip of the stem, just below a leaf node. Remove the lower leaves, keeping only a few at the top. Optionally, dip the cut end in rooting hormone to encourage root development. Plant the cutting in a container filled with well-draining potting soil. Place the container in a warm, bright spot with indirect sunlight. Keep the soil consistently moist, but be careful not to overwater. After a few weeks, gently tug on the cutting to check for root growth. Once roots have developed, transplant the new hydrangea to its permanent location (Jung *et al.*, 2017)

Climate and soil requirement

Hydrangeas generally prefer mild climates. They thrive in temperatures between 10°C to 21°C. Hydrangeas typically prefer partial shade, especially in hotter climates. Morning sun with afternoon shade is ideal. Too much direct sunlight can cause leaf scorch, while too little light can result in poor blooming (Tsukioka and Nakamura 2023).

Planting Time and method

Autumn and early spring are optimal seasons for planting hydrangeas, as they provide ample time for the shrub to develop a strong root system before flowering. Planting in the early

morning or late afternoon is recommended to shield the plants from heat stress during the cooler parts of the day. It's crucial to keep newly planted hydrangeas well-watered until they are fully established. In recent studies, it was observed that best potting media for hydrangea planting is soil + FYM + sand (1:1:1). When planting hydrangeas in gardens, dig holes that are approximately 2 feet wider than the root ball. Ensure the depth of the hole matches the size of the root ball so the plant sits level with or slightly above the surrounding soil. Creating a gentle mound around the base of the plant can aid in directing water drainage away from it (Jung *et al.*, 2017)

Water Requirement

During the growing season, hydrangeas should be watered consistently at a rate 25-50 L of water per square meter per week. To promote root development, deeply water them three times weekly. **Bigleaf** and **smooth** hydrangeas have higher water needs, but all varieties benefit from regular moisture. Watering in the morning helps prevent hydrangeas from wilting during hot days.

Fertilizer Requirement

Apply fertilizer based on the specific needs of hydrangeas, as each variety requires different timing and types of fertilizer. It's recommended to determine your fertilization requirements through a soil test. A balanced fertilizer (e.g., 10-10-10 or 14-14-14) provides equal amounts of nitrogen (N), phosphorus (P), and potassium (K), supporting overall plant health and growth.

- ❖ For **bigleaf** hydrangeas, apply light fertilizer multiple times: in March, May, and June.
- ❖ **Oakleaf** and **panicle** hydrangeas thrive with two applications: in April and June.
- ❖ **Smooth** hydrangeas typically require fertilization once, typically in late winter.

Pest and disease management

Hydrangeas can develop leaf spots, blight, wilt, and powdery mildew. While pests like aphids, leaf tiers, and red spider mites are not common, they can appear when plants are under stress. The best defense against these issues is to provide proper care for your hydrangeas. Implement IPM practices to manage pests and diseases. This includes monitoring, using biological controls, and applying chemical treatments only when necessary. Remove and destroy diseased plant material to prevent the spread of pathogens (Jennings *et al.*, 2023)



Botrytis Blight in Hydrangea

Conclusion

Hydrangea is a beautiful ornamental shrub which has high value in landscaping, floriculture, and nursery trade because of its various forms of flowers, colours, and adaptability to different gardening environments. Its special characteristic of producing different colours of flowers based on the soil pH contributes significantly to its ornamental value, making it one of the most desirable plants both commercially and for private gardens. Hydrangea includes some important species which have distinctive morphological and ornamental features making them useful as landscape plants, potted plants, cut flowers, and flowering hedges. Hydrangea apart from being an ornamental plant is also of great significance in terms of medicine and culture in different regions of the world. Efficient cultivation of hydrangea requires good propagation methods, favourable climate, water supply, nutrient requirements, and disease management. Due to the increased demand of ornamental plants in the world today, hydrangea has great potential for floricultural purposes and urban greening programs.

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