Morphology of Allamanda schottii Pohl

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Abstract- ***In the present investigation is to study the morphology of the ornamental plant Allamanda schottii. It is a shrub, which typically grows more shrub-like than Allamanda cathartica. Trumpet shaped blossoms in clusters appear in throughout the year but flowers are more during the warmer weather. It is cultivated as an ornamental plant but spreads like a weed in many nations. These findings are valuable for botanical identification of the species Allamanda schottii.***

Indexed Terms- ***Allamanda schottii, Apocynaceae, Morphology, Ornamental.***

I. INTRODUCTION

Allamanda Linnaeus (1771) is a small genus mostly restricted to Brazil, with a few native species in Venezuela, Colombia and Peru. *Allamanda* is probably one of the most horticulturally popular genera in Apocynaceae. It can be recognized by the following combination of characters: whorled type of leaf arrangement, infundibuliform corolla, hairs within the corolla tube and above the anthers, style-head with nectary disc at the base, dehiscent capsular fruits, commonly echinate on the external surface.

Allamanda schottii, commonly known as bush allamanda, which is native to Brazil. The genus name is named by Linnaeus in honor of the Swiss doctor and botanist, Dr Frédéric-Louis Allamand, who visited Guyana in the early 18th century. Specific epithet may honor Richard van der Schot. *Allamanda schottii* is a shrub, which typically grows more shrub-like than *Allamanda cathartica*. Trumpet shaped blossoms in clusters appear in throughout the year but flowers are more during the warmer weather. It reach 2.5 meters (8.2 ft) in height and bears large yellow flowers. It is cultivated as an ornamental plant but spreads like a weed in many nations.

Flower morphology is important marking characters in identification. Proper recording of the morphological characters helps in easy identification and distinction of ornamental species as well as utilization in the suitable designs. The study is planned to analyze the vegetative and floral morphology of the species *Allamanda schottii*.

II. MATERIALS AND METHODS

In the present study, the fresh leaves and flowers of *Allamanda schottii* were collected from Kanyakumari District, Tamil Nadu, India during the month of November to December 2022. Kanyakumari District was the Southernmost tip of Indian Peninsula. The soil is red, varying in the quantity of ferruginous element. The climate of the District is warm and humid.

Shoots of three plants were collected and used for leaf and flower data collection. From those shoots, 20 mature leaves and 20 flowers were randomly collected and measured the traits of the species. For each leaf and flower Length and Width were measured with a common ruler. Following this qualitative and quantitative morphological leaf and flower traits were studied.

III. RESULT

I. General Information

Classification	:	APG IV
Kingdom	:	Plantae
Clade	:	Tracheophytes
Clade	:	Angiosperms
Clade	:	Eudicots
Clade	:	Asterids
Order	:	Gentianales
Family	:	Apocynaceae
Subfamily	:	Rauvolfioideae
Tribe	:	Plumerieae

Subtribe : Allamandinae
Genus : *Allamanda*
Species : *schottii*

Synonyms
Allamanda cathartica Schrad.
Allamanda cathartica var. schottii (Pohl) L.H.Bailey & Raffill
Allamanda magnifica B.S.Williams
Allamanda neriifolia Hook.

Common Name
Bush Allamanda, Oleander–Leaved Allamanda.

Vernacular Name
Bengali: Harkakra; Hindi: Pilaghanti; Kannada: Arasinhu; Malayalam: Kolaambi; Marathi: Pivlee Ghunti; Telugu: Allenandatheega.

Native
Brazil

Distribution
Argentina, Australia, Bangladesh, Brazil, China, India, Mexico and Taiwan.

Habitat
Bush allamanda is evergreen and moderately salt-tolerant. They're moderate growers that like full to partial sun light.

Propagation
It was propagated by stem cuttings.

Uses
Allamanda schottii is an ornamental plant grown as a hedge and borders. It has been used traditionally for various medicinal purposes. It's believed to have anti-inflammatory, antifungal and antiviral properties. Fresh juice from the leaves and stems can be applied externally for snake and insect bites, burns, scalds and eczema.

Habit
Shrub

Flowering & Fruiting
Throughout the year

II. MORPHOLOGICAL CHARACTERISTICS

STEM
The stem is erect, older stems are woody and brown, while the young branches are glabrous, brownish green on the upper surface and green on the lower surface. Presence of milky white latex was observed while plucking leaves and flowers.

LEAVES
The whorled type of leaf arrangement occurs, those appear in whorls of five along the stem. The leaves are simple, leathery, elliptic to obovate, entire margin, cuneate base and acuminate apex (Plate 2). The petiole is short, glabrous, green, 0.2–0.3 cm length and 0.2 cm width. The blade was 8.7–11.5 cm long, 2.4–3.7 cm wide, adaxial surface is dark green and pubescent, abaxial surface is light green and glabrous but pubescent in lower midrib and secondary veins. It has 15–19 secondary veins and pinnate venation.

INFLORESCENCE
The inflorescence was cymose panicle, it bears clusters of trumpet shaped yellow flowers (Plate 1). The peduncle was green, pubescent, 3.7–4 cm long and 0.3 cm wide. The bract was deciduous, acute apex, pubescent, green, 0.2–0.4 cm length and 0.1–0.2 cm width (Plate 3).

FLOWER
The flowers are yellow with stripped orange color at the throat, 6.2–7.8 cm length and 2.8–4.4 cm breadth (Plate 5). The flower bud was conical shaped, brownish yellow with 4.6–6.1 cm long and 0.9–1.5 cm wide (Plate 4). The pedicel was green, pubescent of about 0.2–0.6 cm length and 0.2 cm width.

CALYX
The calyx consists of five sepals, in which two sepals are large and three sepals are small, polysepalous with quincuncial aestivation. Sepals are green, glabrous, acuminate to cuspidate apex, 0.5–0.8 cm length and 0.3–0.4 cm width (Plate 9).

COROLLA
The corolla was sympetalous, single whorl, yellow with about 5.8–7.3 cm length and 2.8–4.4 cm breadth. It has five petal lobes with swollen and cylindrical corolla tube (Plate 6). The cylindrical tube was lavender towards the outer region and inner light

green, glabrous on both sides with 1.1–1.8 cm long and 0.3–0.5 cm wide. The throat of the cylindrical corolla tube has white hairs, which was placed above the anthers (Plate 7 & 11). The swollen tube was 2.9–3.9 cm length, 1.6–1.9 cm width, glabrous on both sides, outer region of the tube was yellow towards the upper side and brown towards the lower side, while the inner region was yellow with lavender color line, called as nectar guides (Plate 10). The throat of corolla tube was white in color. At the end of the corolla tube there are five petal lobes. The orbicular shaped corolla lobes are 1.4–2.1 cm length and 1.2–2.2 cm breadth. The corolla has twisted aestivation and overlapping to the left (anti-clockwise).

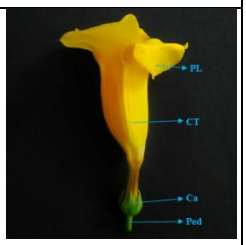
ANDROECIUM

The androecium consists of five epipetalous stamens that are placed at the base of the swollen corolla tube (Plate 7, 10 & 11). The anthers are sagittate, glabrous, introrse and adhere to the stigma via their adaxial surfaces. It was yellow with black apex, 0.3–0.4 cm length and 0.1 cm width. The filament is absent, base of each anther possesses white hairs that resemble a filament (Plate 11 & 12).

GYNOECIUM

The gynoecium consists of two free carpels, The stigma was drum shaped, green, 0.1–0.2 cm length and 0.1 cm width (Plate 7, 13 & 14). The style is simple, white, 1.2–1.5 cm long. The ovary was superior, light green, glabrous, 0.2 cm length and 0.1 cm width. The nectary disc surrounded the ovary, which was yellow with 0.1 cm length and 0.3 cm breadth (Plate 8 & 15). Bicarpellary, syncarpous, unilocular ovary with axile placentation and eight ovules are present.

Plate. The photographs showing the Morphology of *Allamanda schottii*

Plate 1. Habit	Plate 2. Leaf (Dorsal View)	Plate 3. Bract	Plate 4. Flower Bud	Plate 5. Flower
				
Plate 6. L.S of Flower	Plate 7. L.S of Flower Stigma Overview	Plate 8. L.S of Flower Ovary Overview	Plate 9. Calyx	Plate 10. Corolla cut open

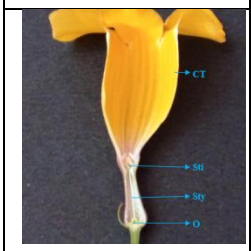
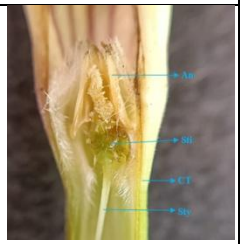
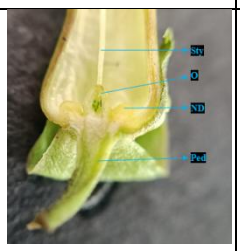
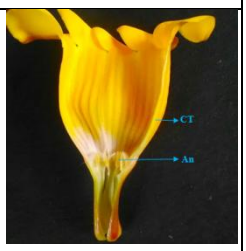

				

Plate 11. Corolla cut open Androecium Overview	Plate 12. Androecium	Plate 13. Gynoecium	Plate 14. Gynoecium Stigma Overview	Plate 15. Gynoecium Ovary Overview

Plate 16. Stages of Flower Development

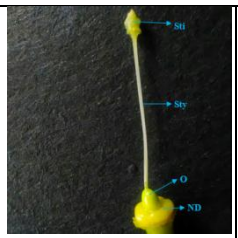


Plate 17. Fruit

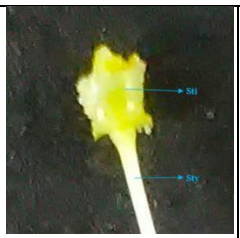
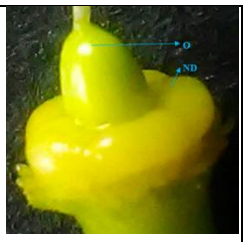


Plate 18. Seed



An- Anther; Ca- Calyx; CT- Corolla Tube; FH- Filament like Hairs; ND- Nectary Disc; O- Ovary; Ped- Pedicel; PL- Petal Lobe; Se- Sepal; Sti- Stigma; Sty- Style

FRUIT

The fruit is globose, bur-like and prickly capsule, 4–4.5 cm long and 4–4.5 cm wide (with spines). The young fruit was green on one side and other side was violet and will become brown when it was matured. The spines are green in color (Plate 17).

SEED

Each fruit has 7–20 seeds. The seeds are spherical shape, brown, 0.6–0.8 cm length and 0.1–0.2 cm width. It has a wing, which were brownish orange, 1.2–1.6 cm length and 0.9–1.1 cm breadth (Plate 18).

DISCUSSION

Fallen (1985) described the *Allamanda* ovary as superior, postgenitally syncarpous, with numerous ovules and a distinct style head; this description is consistent with the findings of the current study. *Allamanda blanchetii* morphology is described by Gilman *et al*. (1999), Morales (2014) and Alves *et al*. (2017). *Allamanda cathartica* morphology is described by Gilman (1999) and Ghosh *et al*. (2019). Souza-Silva & Rapini (2009) studied the morphology of the species *Allamanda calcicola*.

CONCLUSION

Each and every living organism has a definite form. Study of the external structure or morphology helps us to identify and distinguish the species. Knowledge of morphology of plant is also helpful in the study of various other fields such as genetics, plant breeding, genetic engineering, horticulture, crop protection and others. Based on these findings, the *Allamanda schottii* plant species were distinguished from other species of the Apocynaceae family.

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