

Anatomical Study of Some Characters in Certain Species of Genus *Jasminum* L. Growing in Iraq

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Abstract: Anatomic study of the epidermis types of leaves have shown that jasmine epidermis cells showed a difference between the Adaxial and Abaxial of the leaves, the epidermal cells were characterized in both surfaces a Straight shape this species were *J. grandiflorum* and *J. sambac* and *J. mesnyi* and Undulate in *J. officinals* also that all species under study not containing any shape of crystal in epidermis cells except epidermis of the species *J. sambac*, contain prismatic crystal and druces crystal. The stomata characterized in the species under study being from the style Anomocytic type and Hypostomatic leaf that's means the stomata present on the Adaxial surface only. The current study shown also that the indumentum in the species belonging to the genus Jasmine consists of glandular and aglandular trichomes, the glandular trichomes exist in the species *J. mesnyi* and *J. sambac* and the aglandular trichomes stationed on the edges and surface of the leaf in the species *J. grandiflorum*, *J. officinals* and *J. mesnyi*.

Keywords: Oleaceae, *Jasminum*, Anatomical study

1. Introduction

Jasminum was deciduous or evergreen shrubs belonging to the family Oleaceae, the plant was grower actor branched or climbing, contains about 200 species native to the original back to tropical and warm temperate regions in Asia, Europe, Australia and the Pacific Islands, it is grown widely because of its distinctive smell flowers [1]. Also grown in gardens, greenhouses and plant flowers used for decoration in South and Southeast Asia [2].

Made of jasmine flowers in the China tea drink jasmine tea where they are blended black tea leaves with jasmine flowers in a special device at a given temperature for four hours to mix fragrances together and to absorb the smell and flavor of jasmine flowers before tea leaves is called [3].

Broadly are growing jasmine in India, where use flowers to decorate the houses of worship and decorate the hair and jewelry making, as extracted from the finest perfumes and used in the ritual of marriage and religious ceremonies and festivals and mix flowers with water and paste of sandalwood to wash the gods in religious holidays as part of the ritual worship of Hinduism [4]. In Syria the jasmine flowers considered a symbol of the country and in Thailand is considered a symbol of maternity and in European countries such as France is extracted from the flowers finest French perfume distinctive [5].

Flowers jasmine are considered as important medicinal plants it is used in India for many Asian countries as a drink a sedative for depression and nervous exhaustion and conditions associated with tension as jasmine is also used to treat colds, coughs, sore throat, dysmenorrhea, labor pains, uterine disorders and many skin problems [6], also were used *Jasminum mesnyi* and *Clerodendrum inermis* flower to treatment of diabetes widely in the traditional system of medicine in India also used for the treatment of intestinal and stomach cancer and as an anti-bacterial [7].

Effective chemicals accumulate in high-priced oil price in terms of jasmine flowers used to make perfume too

expensive and has been producing a large amount of concrete jasmine in India over the past 20 years [6], so preferably two species of aromatic jasmine flowers to produce a distinctive essential oils that was *J. grandiflorum* and *J. sambac* where they can produce 25-30% of the essential oil distinguished from species I and about 15-18% of species II and this also depends on the oil extraction technique as well as the essential place of growing plants [8].

The aim of the study is to identify some of the anatomical characteristics of the leaves of this species, which is one of the plants that are used widely as plants and plants medical intervention in the perfume and other industry.

2. Marital and Method

Fresh material of *Jasminum* was collected from gardens throughout Iraq. The epidermis were prepared followed by washing with distilled water, put it in 10% KOH, then passed through alcohol for 10-15 minute and then stained by 1% safranin for 30-45 minute. Excess stain was washed off with distilled water, dehydrated by ethanol series (70, 95, and 100%) and cleared with pure xylene 10 minute. Finally, the epidermal samples were put on the slides and mounted by cover slides with Dextrin Plasticizer Xylene (D.P.X) artificial mounting medium.

The prestaining and staining procedure was performed according to [9].

The epidermis using stomatal index [10] as follows:

$$\text{Stomatal index} = \frac{\text{number of stomata}}{\text{number of stomata} + \text{number of ordinary epidermal cells}} \times 100$$

All permanent slides were examined by Olympus BH2 light microscope and photographed using Olympus CH3 camera.

3. Result and Discussion

1) Epidermis and stomata

In surface view of epidermis cells the vertical walls showed Anticlinal Wall in species belonging to the family Oleaceae different forms due to species differences even among biplane Adaxial and Abaxial of the leaf and itself plant, the cells were characterized in the Adaxial and Abaxial straight in *J. grandiflorum*, *J. sambac* and *J. mesnyi* and sinuous or undulate in *J. officinals*, (Fig1), also all epidermis in the species under study not containing crystals except *J. sambac* containing distinguishing prismatic and druses crystal (Fig 2).

Stomata characterized in the species under study being of Anomocytic style, which is characterized by the absence of subsidiary cell surrounded the guard cell, also all species characterized by that the leaves of the Hypostomatic leaf this means that the stomata present on the Abaxial surface only, the form of the guard cell on the Abaxial reniform in all species, (Fig 1) and guard cells for were surrounded by six ordinary cells, as well as the walls of ordinary cells differentiated in the species under studied, where the undulating walls in *J. officinals* and straight walls in *J. sambac*, *J. grandiflorum* and *J. mesnyi*, (Fig 1). This is consistent with [11].

2) Indumentum

The current study showed that the indumentum in the species belonging to the family Oleaceae made up of different shapes of trichomes, on this basis possible division of species into two groups according to the type of trichomes which they are located as follows:

Group I: they contain aglandular trichomes represented in species (*J. grandiflorum*, *J. mesnyi* and *J. officinals*).

Group II: containment glandular trichomes represented in species (*J. sambac*).

aglandular trichomes in general was unusual unicellular and uniseriate with thin walls and sharp peak in the species *J. grandiflorum* and multicellular and uniseriate with thin walls and sharp peak in the species *J. officinals* and *J. mesnyi*, also stationed on the edges and surface of the leaves in all species mentioned above, (Fig 3).

Glandular hairs were different in lengths and composed from glandular head papillary in form as well as unicellular and multicellular neck and scattered on the superficial of leaves in the species *J. sambac* only (Fig 4). Results of study are consistent with [12] in their study of the anatomical collection of medicinal plants.

Table 1: Epidermal cells and stomata dimensions in *Jasminum* leaves (in micrometer)

Species	Adaxial	Abaxial						Stomatal index
		Dimension of ordinary epidermal cell		Dimension of stomata		Dimension of guard cell		
		Length	Width	Length	Width	Length	Width	
<i>Jasminum grandiflorum</i>	nil	(22.5-25) 23	(20-30) 25.5	(18.6-20.8) 19.1	(13.6-16.5) 15.2	(15-25) 19.37	(3.5-7.75) 5.41	16.6
<i>Jasminum officinale</i>	nil	(25-27.5) 26.5	(25.5-32) 28.5	(17.2-19.3) 17.2	(7.9-9.8) 8.1	(24-30) 26.5	(4-10.75) 6.5	15.9
<i>Jasminum mesnyi</i>	nil	(24.5-28) 27.5	(35.5-38) 36	(18.4-19.8) 18.9	(14.5-15.8) 15.8	(27.5-29) 28.5	(2.5-6.75) 5.6	16.7
<i>Jasminum sambac</i>	nil	(23.5-28) 26	(30.5-34) 32	(14.7-16.3) 15.5	(9.3-10.6) 9.5	(26-29) 27	(3.5-8.75) 5.6	18.8

*Note: The numbers in outside brackets represent average and in the brackets represent upper and lower limits.

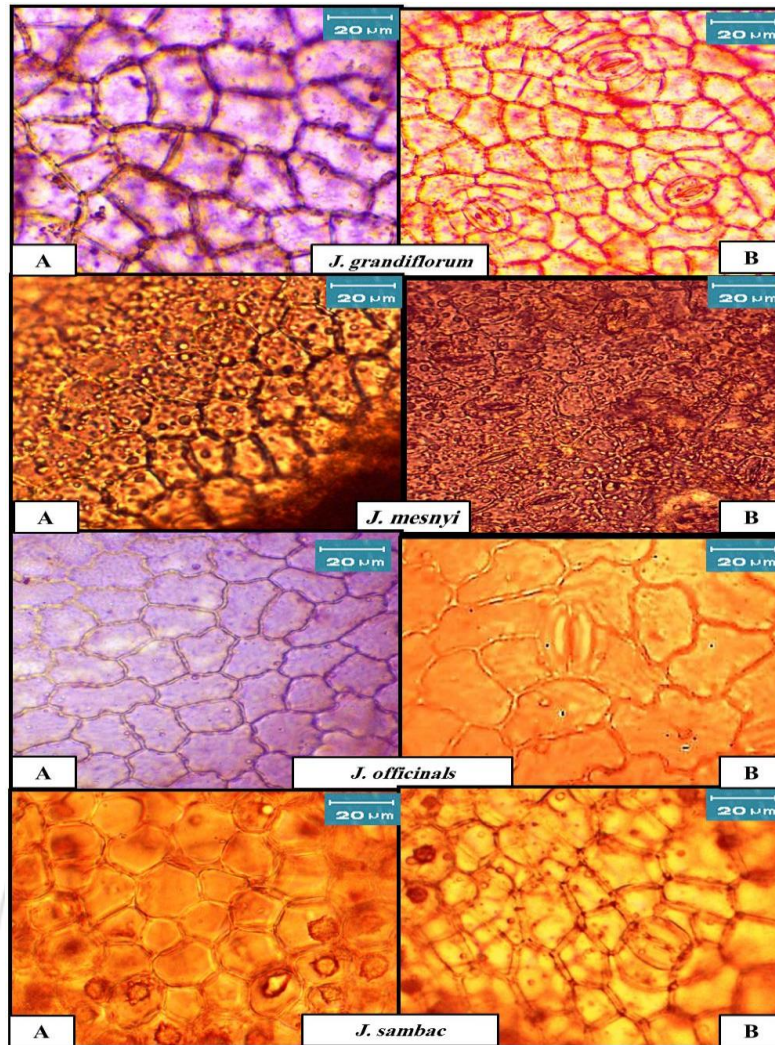


Figure 1: Variation in epidermis leaf among *Jasminum* species showed the stomatal complex where A: adaxial surface, B: abaxial surface (scale bar 20 µm).

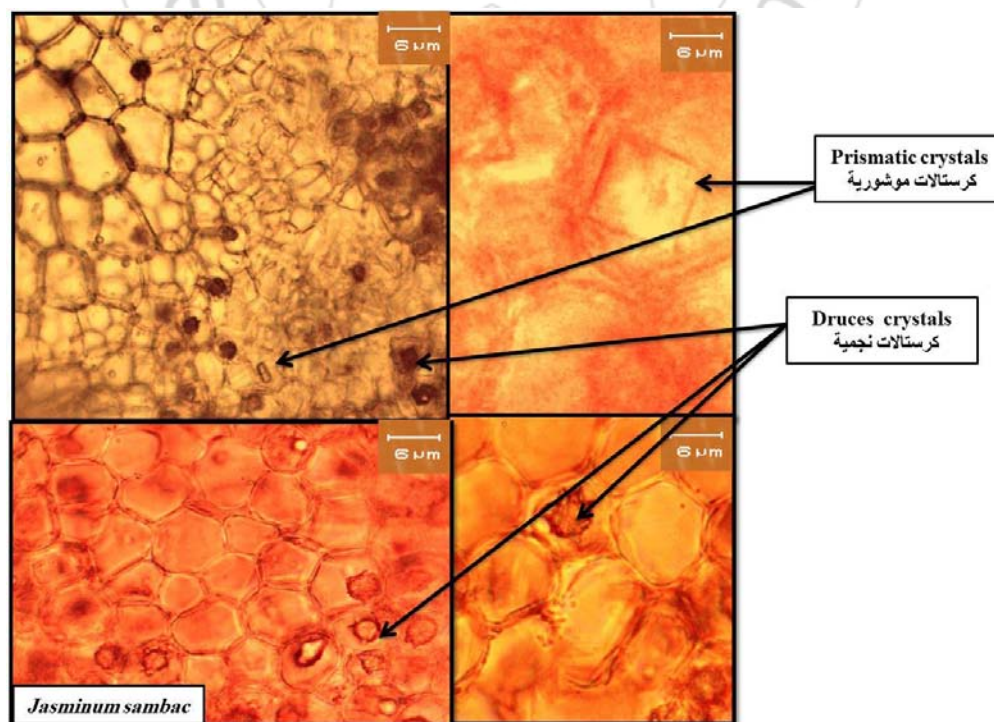


Figure 2: Shape of crystals in the species *Jasminumsambac*

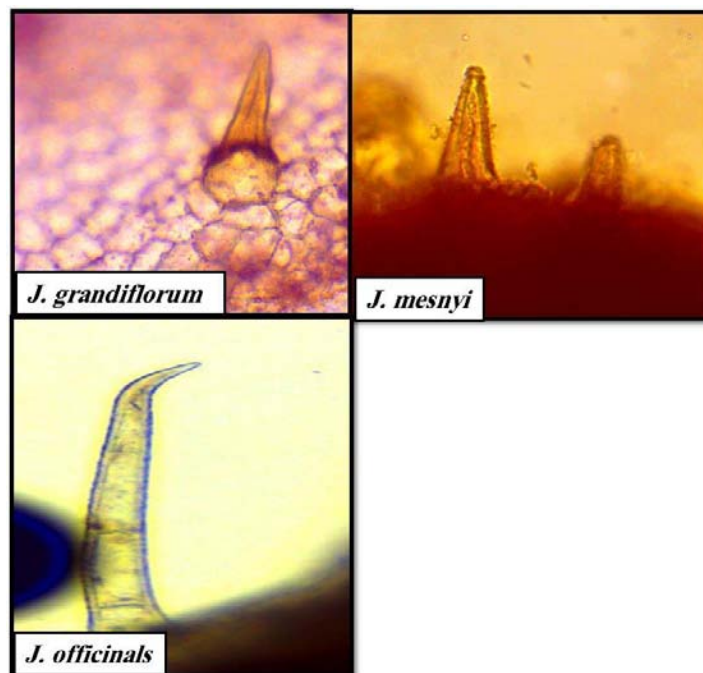


Figure 3: Shape of glandular trichomes in the species under study

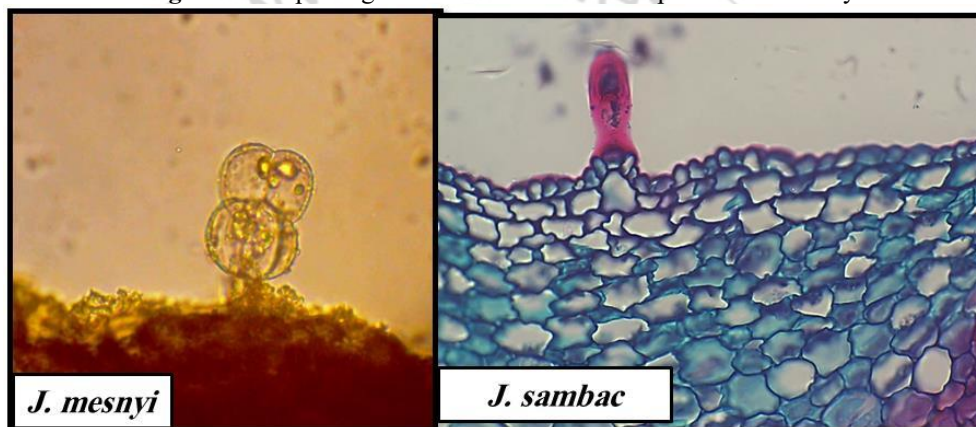


Figure 4: Shape of glandular trichomes in the species under study.

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