



# TAXONOMICAL STUDY FOR THE SPECIES *VOLKAMERIA INERMIS* L. (LAMIACEAE)

**Khansaa Rasheed Al-Joboury**

Iraq Natural History Research Center and Museum, University of Baghdad, Baghdad, Iraq.

## Abstract

Taxonomic studies for the species *Volkameria inermis* L. which grown in Iraq. The flowering plants are collected, preserved, identified and classified which belongs to the Lamiaceae family. Morphological and chemical characteristics and the flowering and fruiting period were studied in this article. The determining of five flavonoid compounds using high performance liquid chromatography (HPLC) and the results showed that the five flavonoid compounds which found in this species are: hispidulin, Apigenin, Scutellarein, oleanolic acid and clerodermic acid. The concentrations of the chlorophyll content also studied for the leaves.

**Key words :** *Volkameria inermis* L., Taxonomy, species, Lamiaceae, study.

## Introduction

*Volkameria* is the largest genus in the family Lamiaceae with about more than 300 species and varieties distributed in Africa and Asia, And about 20 species are native in the new world and many are cultivated as ornamentals (Manoharan *et al.*, 2008). This genus belongs to a family of Lamiaceae. *Volkameria* broadly spread in subtropical as well as in tropical areas of this world. Numerous species of *Volkameria* genus exhibited its medicinal significance which described for several native schemes for drugs as well as for traditional medications. Múlgura *et al.*, (2002) described that *Volkameria* genus is a valuable source for natural products such as bioactive compounds and antioxidants that are very advantageous to human health (Phillipson and Allorge, 2016). *Volkameria inermis* is an ever-popular shrub which originated inhabitation botanical gardens. In Thailand, this species has been successfully used in traditional medicines to treat various ailments such as skin disease. In India, the distillate that is obtained from its foliage is used in Ayurvedic medicines to treat spasmodic fever (Shrivastava and Patel, 2007). Moreover, its squash of foliage, as well as its stocks, have been cast off for the treatment of venereal ailments and scrofulous illnesses. So the flavonoids are widely spread plant

secondary metabolites called C6 –C3 –C6 phenolics, that are classified for three groups, depending on the nature for the C3 fragment and the type of the heterocyclic ring. Flavonoids are a well-defined group for compounds which established physical and chemical characteristics. This especially counts to their absorption for ultraviolet (UV) radiation (Qureshi *et al.*, 2014).

## Materials and Methods

### Morphological studies

In this study, samples were collected from Bagdad. So the identification was performed then morphological measurements are taken for all parts of the plant and recorded for using these features and result in the taxonomy for other similar plant. Identification were carried out by referring to Rueda (1993).

### Chemical studies

The flavonoid compounds were detected of the leaves of this species by HPLC Chromatography analysis following the method of Harborne (1973).

## Results and Discussion

### Morphological studies

Variation in morphological features of this species

was studied after the Identification (table 1).

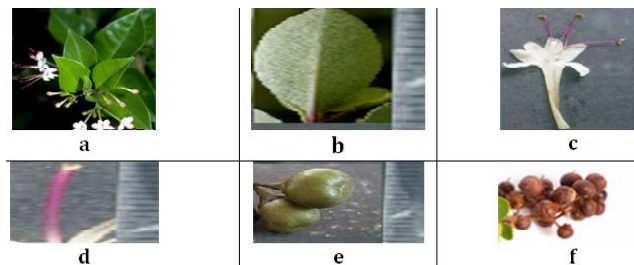
**Table 1:** Systematic Classification of *Volkameria inermis* L.

Kingdom	Plantae
Division	Angiosperms
Class	Asterids
Order	Lamiales
Family	Lamiaceae
Genus	<i>Volkameria</i>
Species	<i>V. inermis</i>

*Volkameria inermis* L is erect bush, scrambling or scandent that can reach up to 3 m tall. The branches and branchlets are slender but the nodes are not annulated. The shape of the leaves are elliptical or lance-, about 3-10 X 1-4 cm, acute on the base, obtuse or acuminate on the apex, entire, glabrate above, and the petiole about 1-1.5 cm long. The cymes are axillaries and its 3-7-flowered, solitary, opposite and about 5-10 cm long. The shape of the sepal is bell and the tube is 5 mm long, 5 toothed and its green. The petal slender tube, about 2-4 cm long, The stamens are long exerted pubescent on the base of filaments, reddish - purple and the fruiting green sepal, Style and ovary glabrous. These distinguishing characteristics can be used for putting the key to this species taxonomy Townsend and Guest (1980) reported about the importance of morphological study in plant taxo

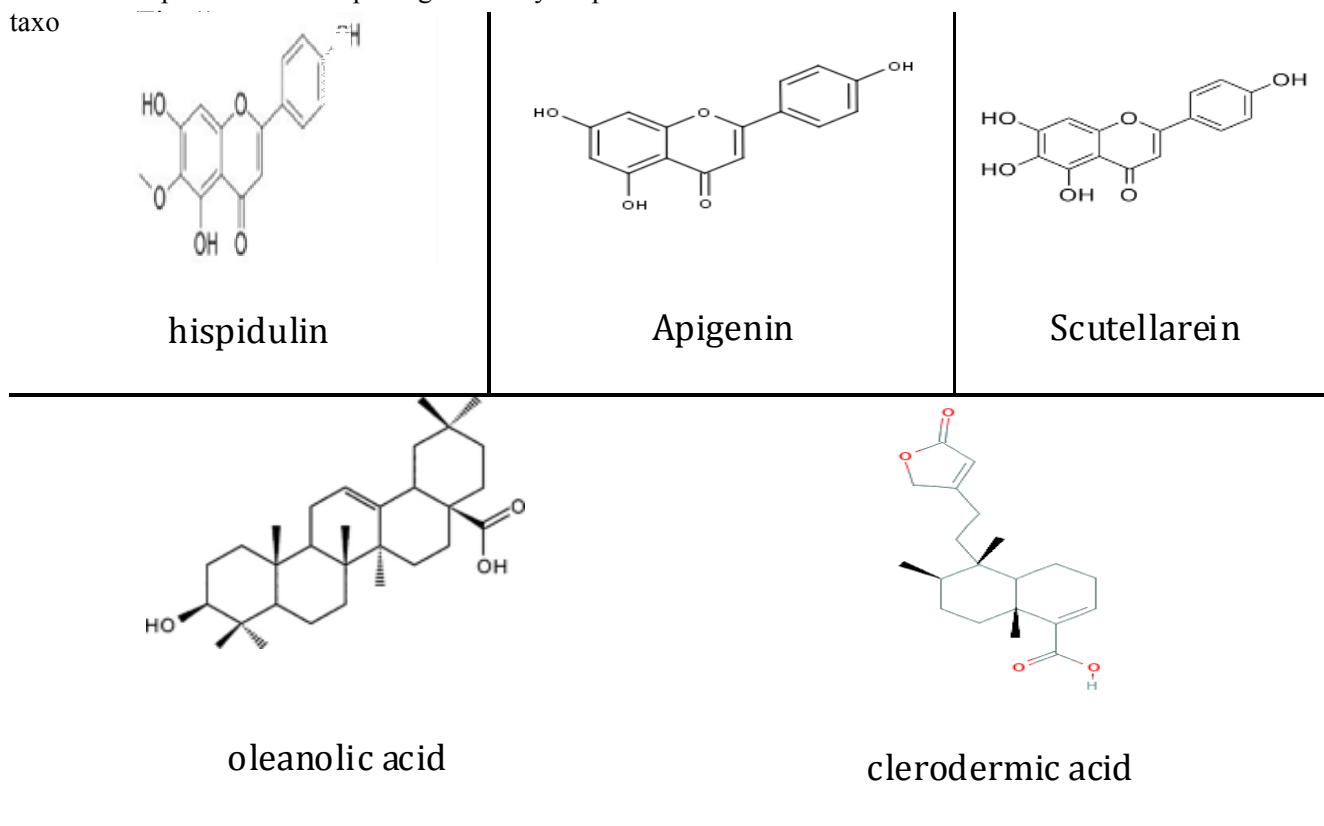
**Table 2:** The flavonoids component of the species.

No.	Flavonoid Compounds	Retention time	Area
1	hispidulin	16.66	22.72
2	Apigenin	13.73	17.52
3	Scutellarein	12.55	19.53
4	oleanolic acid	15.92	26.81
5	clerodermic acid	11.42	19.63

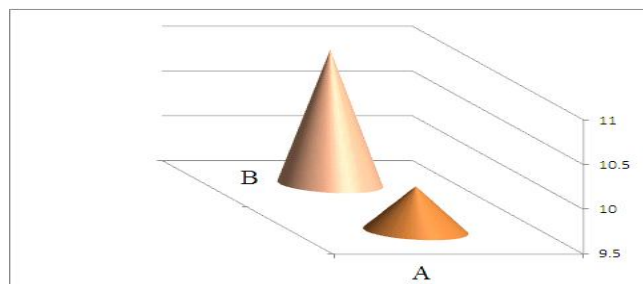


**Fig. 1:** Morphological features of *Volkameria inermis* L. a: the species b: the leaves, c: the flower, d: the stamens, e: the flower, f: the fruits.

The detection for flavonoids with HPLC for the aerial parts of the species *Volkameria inermis* L. were found (Table 2). According to Sultana *et al.*, (2008) flavonoids are a class for naturally occurring plant secondary metabolites imparting protection for the reservoir. According to Proestos *et al.*, (2006) that they are



**Fig. 2:** The structure of the investigated flavonoid.



**Fig. 2:** Flowering and fruiting periods for the three species.

compounds for low molecular weight and chemically polyphenolic to nature presenting a common benzo- $\gamma$ -pyrone structure. They had enormous biological and pharmacological activities giving health benefits for the human. They are the group for compounds that receive considerable attention with the researchers as depicted in the scientific literature. They are present with plants as glycosides while can also isolated with free aglycon. In this study we observed that the species *Volkameria inermis* L. studied varied in its flavonoid content, The study included the identification for five flavonoids components in this species which are the: hispidulin, Apigenin, Scutellarein, oleanolic acid, clerodermic acid (Fig. 2) this agree with N'guessan *et al.*, (2010) and Harborne and Williams (2000).

Differences in the flowering and fruiting period were observed in this study species (Fig. 2). We found that the period of flowering was in October and the period of fruiting was in November, Our results identical to that found by Townsend Guest (1980).

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