

Phytochemical Investigation of *Dipcadi erythraeum*

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Abstract

Background: *Dipcadi erythraeum* is a wild edible species belonging to family Asparagaceae and commonly used in folk medicine.

Aim of Study: This study was designed to carry out a detailed phytochemical screening of the active constituents in the bulbs, stems, leaves and flowers of *Dipcadi erythraeum*.

Material and Methods: Phytochemical screening were done for *Dipcadi erythraeum* plant after collection from Kabd and Ahmadi deserts in Kuwait during spring 2005.

Results: *Dipcadi erythraeum* was reported to contain high glycosides levels, but from the phytochemical screening it showed no significant levels. The presence of flavonoids and starchy carbohydrates was noticeable.

Conclusion: The results of the current paper could serve as a starting point for further investigation of the flavanoid contents of the *Dipcadi erythraeum* plant.

Key Words: *Dipcadi erythracum* – Flavonoids – Glycosides – Liliaceae.

Introduction

DIPCADI Medik is a genus of bulbous flowering plants which is recently belonging to the subfamily Scilloideae of Asparagaceae family. It contains about 40 species, commonly distributed in different areas such as Southern Europe, most area of Africa, the Middle East and also East to South Asia [1].

South Africa has the greatest diversity of distribution as contains 13 species [2] followed by India which contains 9 species [3].

In Egypt, the genus *Dipcadi* is also a member of family Hyacinthaceae and is found in two

species: *Dipcadi erythraeum* (*D. erythraeum*) and *Dipcadi unifolium* Bak [4].

The genera of this family were initially included within Liliaceae S.L. [5].

D.erythraeum is a wild medicinal plant. Its bulb and capsule are edible especially in Pakistan [6].

In Bahrain, the leaves can be used as a laxative and as an ointment for wounds treatment [7].

Dipcadi erythraeum is known as the desert lorowan bell of Kuwait, there are probably five species found in Kuwait and Saudi Arabia. This plants usually has 2-3 leave, that lye on the sand surface moving around by the wind forming circular tracks on the sand [8,9], as shown in Figs. (1,2).

Dipcadi erythraeum is observed to be found in rocky and gravelly habitats where rainwater are collected for some days. Despite, the leaves are narrowly linear, the flowers have green color. Flowers and fruits appear during the months from August to September. *Dipcadi erythraeum* is a medicinal plant which has different important folk uses. Although the bulbs and capsules are raw, they can be eaten during the famine [10].

Rizk [11,12,13] had reported on *Dipcadi erythraeum* constituents. In this report *Dipcadi erythraeum* was tested for the presence of active constituents after doing a through background search in the published literature.

No previous phytochemical studies have been reported for kuwait's *D.erythraeum*. The present study aimed to design a detailed phytochemical screening of the active constituents in the bulbs, stems, leaves and flowers of *Dipcadi erythracum*.

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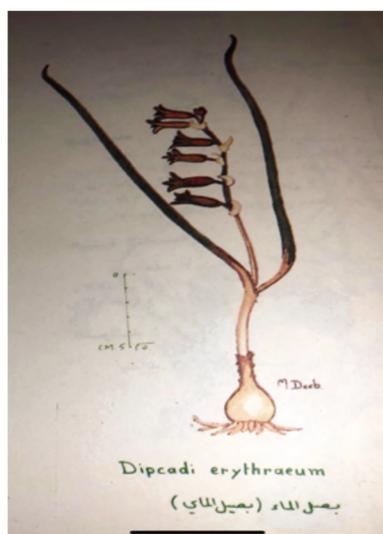


Fig. (1)

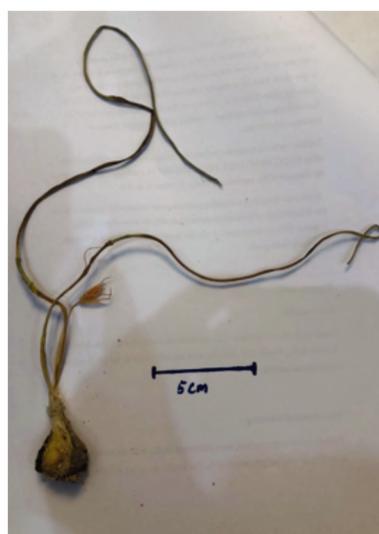


Fig. (2)

Figs. (1,2): Phytochemical screening for *Dipcadi erythraeum* plant.

Material and Methods

Experimental:

Plant material:

Plant material was collected from Kabd and Ahmadi deserts in Kuwait during spring 2005. Voucher specimens were deposited at Kuwait university herbarium after authentication by Dr. KT. Methew the herbarium Keeper.

Phytochemical screening were done as in Bain & Tuner [14].

Results

Macroscopy:

A perennial plant, as shown in Fig. (2) up to 20cm tall with a grey, ovate conical bulb. 3-4cm long: Leaves narrow linear. In floescence one sided raceme with 5-12 flowers, 12-55mm long: Pedicel very short capsule large. Deeply 3-grooved. Seeds plano convex ovate in outline.

Discussion

The genus *Dipcadi* is recently belonging to the subfamily Scilloideae of the family Asparagaceae. It is reported mainly from Africa, peninsular India, Madagascar, and also neighboring Pakistan. Ten species of this genus are reported, of which *D. erythraeum* Webb & Berthel is distributed in India as well as in different tropical regions of the world such as the Canary Islands, Arabia, Egypt, and Saudi Arabia [15].

As mentioned before, in addition to the use of the leaves as laxative and as an ointment for wounds [7], the whole plant can be used for treatment of cough, biliousness, diabetes, urinary and discharge.

Phytochemical screening of some *Dipcadi* species reported tannins, alkaloids, flavonoids, and saponins presence [16,17,18].

El-Shabrawy et al., reported that from the *D. erythraeum* whole plant defatted aqueous methanol extract, two flavonol aglycones (kaempferol and quercetin), one flavonol glycoside (quercetin 3-O-rutinoside-7-O- α -rhamnopyranoside), and four C-glycosyl flavones (vitexin, isovitexin, orientin, and isoorientin) can be isolated [6].

Table (1): Phytochemical screening test.

Test For:	Bulb	Stem and Leaf	Flower
<i>Sterols & triterpenes:</i>			
Libermanns test	++ve	+ve	+ve
<i>Sterols & triterpenes:</i>			
Libermanns test	++ve	+ve	+ve
Salkowshki test	++ve	+ve	+ve
<i>Alkaloids or nitrogenous bases:</i>			
Dragendorff's reagent	+ve	-ve	-ve
Wagner's reagent	+ve	-ve	-ve
Mayer's reagent	-ve	-ve	-ve
<i>Cardiac glycosides:</i>			
Keller lilliani test	+ve	-ve	-ve
Baljet reaction	-ve	-ve	-ve
<i>Flavonoids:</i>			
NaoH test	++ve	+ve	++ve
NH ₄ OH test	++ve	+ve	++ve
ALCL ₃ /UV test	+ve	+ve	++ve
<i>Anthraquinones:</i>			
Borntrager's test	+ve	-ve	+ve
<i>Tannins:</i>			
FeCl ₃ test	+ve	-ve	-ve
<i>Saponins:</i>			
Forth test	+ve	-ve	-ve
<i>Carbohydrates:</i>			
Molish test	+++ ve	+ve	+ve

+ve Slight. ++ve Moderate. +++ve High. -ve Negative.

From Table (1), it's obvious that this plant contains very little cardiac glycosides while its high in flavonoids and carbohydrates. Other Constituents such as alkaloids and anthraquinones are present in slight quantities.

Conclusion:

From the literature review and the relatively larger size of its bulbs in these series of studies, it was anticipated that this plant could contain high alkaloidal and glycosidal levels, but from the phytochemical screening it showed no significant levels. The presence of flavonoids and starchy carbohydrates was noticeable. This paper could serve as a starting point for further investigation of the flavanoidal contents of the *Dipcadi erythraeum* plant.

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دراسة كيميائية نباتية لبصل الماء بصيل الماي

بصل الماء أو بصيل الماي هو نبات يوجد فى كثير ممن البلدان العربية ويعرف فيها بأسماء مختلفة وهو نوع برى صالح للأكل ويستخدم عادة فى الطب الشعبى.

الهدف من الدراسة: تم تصميم هذه الدراسة لإجراء فحص كيميائى نباتى مفصل للمكونات النشطة فى السيقان والأوراق والزهور من نبات بصل الماء أو بصيل الماي.

خطة البحث: تم إجراء الفحص الكيميائى للنبات بصل الماء أو بصيل الماي بعد جمعه من صحارى كبد والأحمدي فى الكويت خلال ربيع عام ٢٠٠٥.

نتائج البحث: من المعروف أن نبات بصل الماء أو بصيل الماي يحتوى على مستويات عالية من الجليكوسيدات، لكن أثبتت نتائج البحث من خلال الفحص الكيميائى للنبات أنه لم تظهر أى مستويات ذات دلالة إحصائية بل كان وجود مركبات الفلافونويد والكربوهيدرات النشوية ملحوظاً.

وأخيراً يمكن أن تكون نتائج هذه الدراسة بمثابة نقطة بداية لعمل المزيد من الفحص الكيميائى للتحقق من محتويات مركبات الفلافونويد لنبات بصل الماء أو بصيل الماي.