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Pharmacognostical evaluation of *Peucedanum grande* C.B. Clarke seed

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Abstract

Peucedanum grande C.B. Clarke (Apiaceae) has long been employed for diverse maladies in traditional systems of medicines; predominantly it is excessively practiced as diuretic and emmenagogue. In this study effort was made to appraise various pharmacognostic standards desired to ascertain the purity, safety, and efficacy of seed of medicinal plant *P. grande*. The study on this drug increase the importance that no work report is available on the pharmacognostic study of this drug. Results displayed in the study revealed that the anatomy of the seed showed the presence of epidermis, cuticle, thick walled parenchyma, epicarp, mesocarp and flattened endospermic cells. Whereas the microscopy of the seeds revealed the existence of fiber cells, cuticular stratifications, tuft of Sclerenchyma cells with sclereids, endospermic cells with oil globules and annular thickening of vessels. The findings evaluated from the current study will help to authenticate the medicinally important plant *P. grande*. Additionally, macroscopic, microscopic and powder study attributes may perform as a governing factor for developing the pharmacopeia standards.

Keywords: Apiaceae, *Peucedanum grande*, pharmacognostic, standardization

1. Introduction

Duqu (*Peucedanum grande* C.B. Clarke) is a succulent herb, belongs to the family Apiaceae earlier known as Umbellifereae. This is one of the largest plant families in the world that comprises of approximately 450 genera and 3700 species worldwide [1]. The plant is commonly found in Europe, Asia, North East Africa, South West America and Iran. In India it is explored on the Western Ghats and the hills of Deccan plateau. It is an erect herb 3-4 ft in height; stem is fistular, leaves are pinnate or bipinnate, flowers are yellow and umbel shaped. Fruits (mericarps) are long, obovate or broadly elliptical, winged, reddish yellow lines in the middle, having strong lemon like scent and are extensively used in medicine. The fruits release light yellow essential oil having powerful essence similar to carrot oil. Ibn Sina reported that Duqu are the seeds of wild carrot [2]. The temperament of Duqu in Unani System of Medicine are assumed as Hot 3° and Dry 2° [3]. Hakeem Syed Saifuddin Ali in *Unani advia emufarrada*, explained the role of fruits in Unani Medicine and has been reported to possess important biological properties [4, 5]. It is also an important ingredient of several formulations viz., Dawaul Kurkum, Majoon Yadullah and Amrosiya used as a diuretic as well as lithotriptic [6, 7]. The fruits have different pharmacological activities and hence used by Unani Physicians as deobstruent, stimulant, gastric tonic, digestive, carminative, diuretic, antihelminthic, aphrodisiac, anti-inflammatory, expectorant, spermatogogue [2, 5, 8-11]. Some of the important biological properties are ability to induce apoptosis, antibacterial, hepatoprotective, vaso-relaxant, cyclooxygenase inhibitory and antitumor activities [12]. Methanolic extract of *P. grande* have been reported to express the nephroprotective activity against mercuric chloride induced acute renal failure and oxidative stress [13]. So keeping this view in mind the current study has been conducted for the pharmacognostical appraisal, for the preparation of formulations and for documentation in the form of a monograph.

2. Taxonomical Classification

Kingdom:	Plantae
Sub kingdom:	Tracheobionta
Super division:	Spermatophyta
Division:	Magnoliophyta
Subclass:	Rosidae
Order:	Apiales
Family:	Apiaceae
Genus:	<i>Peucedanum</i>
Species:	<i>grande</i> C.B Clarke

2.1 Vernacular name

Urdu	Duqu
Arabic	Bazar jazarul Buri
Hindi	Duku
Guajarati	Baphali
Persian	Tukhme Gazar
Tamil	Carrot king
Sanskrit	Baspika, Ela
English	Wild carrot

Part used: Seed

3. Material and Methods

Pharmacognostical Studies

The seeds of the plant *Peucedanum grande* C.B. Clarke were procured from the local market of New Delhi and authenticated by Botany Section (Pharmacognosy Lab.), Drug Standardization Research Institute, Ghaziabad. Hand section of the seeds with the help of potato pith was taken, stained and mounted following usual micro-techniques [14] and representative diagrams were taken with the help of digital microscope for photo documentation (Motic).

4. Observation and Results

4.1 Macroscopical study

Duqu are the seeds of wild carrot, resembling ajwain odour

and taste is sour. Due to their small size fruits are called as seeds. The seed is obovate or broadly elliptical, long, narrow winged, reddish yellow colour and excessively used in the medicine preparation (Fig. 1)

4.2 Microscopical study

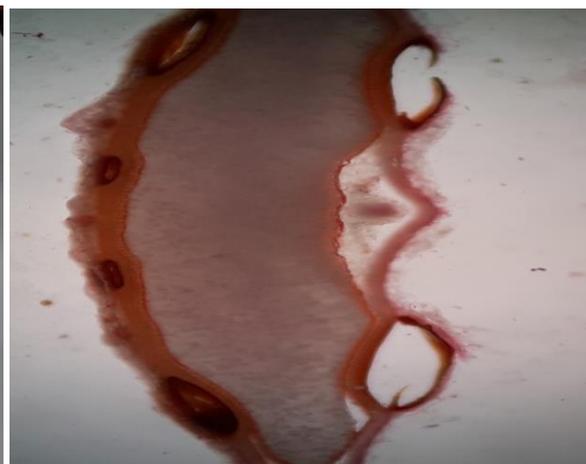
The microscopic characters of Duqu generally resemble the structure of an umbelliferous fruit (Seeds) and section showed the tubular epicarp followed by a fibrous mesocarp. The endosperm contains aleurone grains and oil droplets. Each mericarp has four vittae on dorsal surfaces. The outer epidermis has prominent cuticle and the mesocarp contains lignified reticulate parenchyma. The endosperm having large flattened cells. The test a consists of parenchymatous cells containing fixed oils and aleurone grains (Fig. 1).

4.3 Powder Study

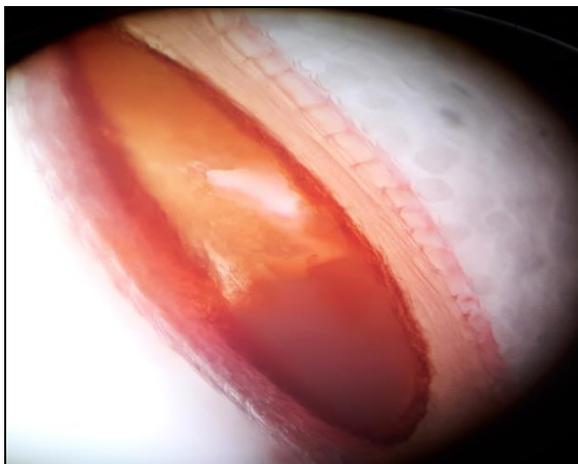
The diagnostic features of powder microscopy showed the presence of segments of epicarp with uniform thickening and cuticular striations; in surface view sclereids of the mesocarp appeared, composed of thick walled cells surface with rectangular in outline having large number of prominent pits. The figure showed the presence of reticulate parenchyma that are formed of thick wall lignified walls. The fragments of fibro-vascular tissues are made up of fibres and vessels showing annular thickening (Fig. 2).



Seeds in ptrydish



Enlarge view of the seed wings with four vitae



Vittae on dorsal surface



Epidermis has prominent cuticle



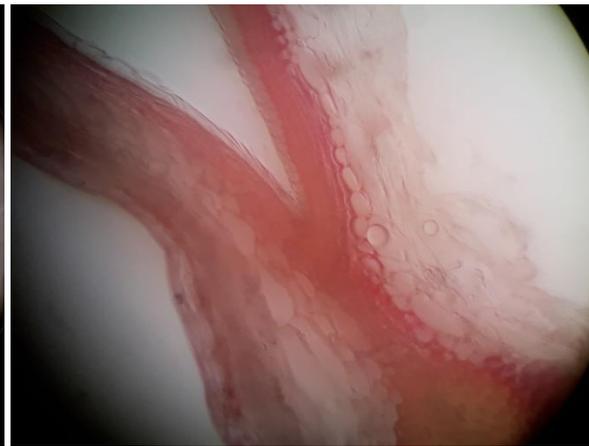
Endosperm with aleuron grains and oil globules



Cuticle with thin layer parenchyma cells



Fibrous mesocarp and thick-walled elongated endocarp



Lignified reticulate parenchyma

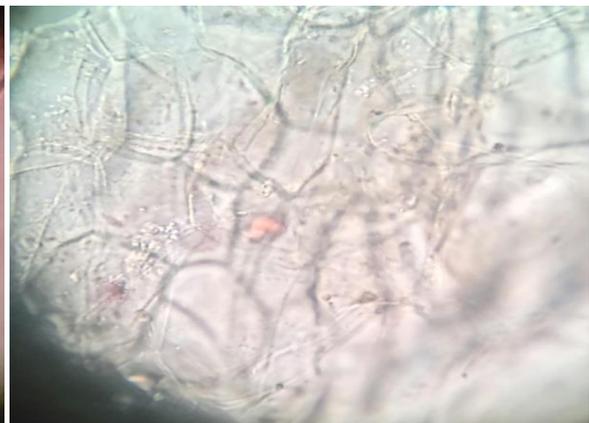


Epiracarp and mesocarp

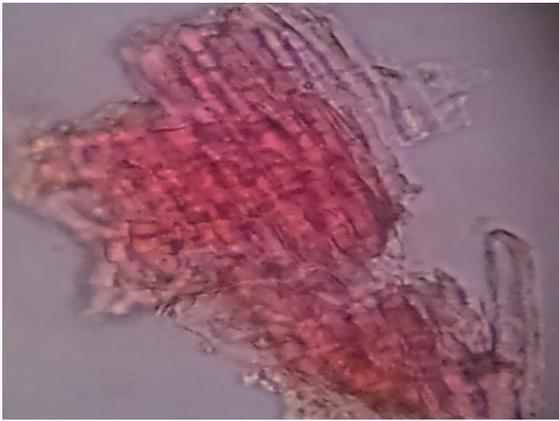
Fig 1: Macroscopic and microscopic study of *Peucedanum grande* seed Powder Study



Fiber cells with narrow lumen



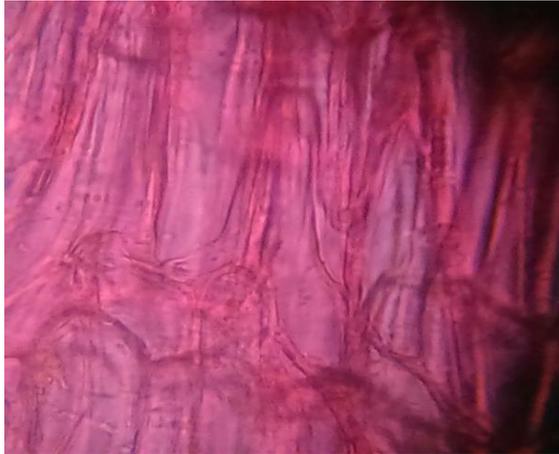
Endospermic cells with oil globules



Tuft of Sclerenchyma cells



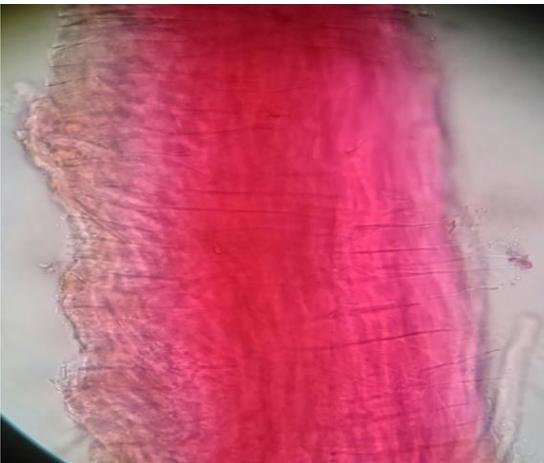
Cuticular striations with epidermal cell



Thick walled sclerenchymatous cells with sclereids



Endospermic cells with starch grains



Wavy sclerenchyma



Annular thickening of vessels

Fig 2: Powder study of *Peucedanum grande* seed

5. Conclusion

Peucedanum grande is mentioned in Unani medicine with many clinical properties. The present work has been executed according to Unani Pharmacopoeia of India and other official standards. This is the first report on the authentication of this drug pharmacognostical. This clearly demonstrates the anatomy and microscopy of the plant. Authentication of drug by macroscopic, microscopic and powder study (Fig-1 & 2) illustrates the genuineness and purity, that may help to ensure the quality of the crude drug. From the finding it can also be concluded that the generated data can work as the source of information to deduce the authenticity and standardization of the available drug sample.

6. Acknowledgment

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