



Review Paper

## Unani Description of *Duqu* (*Peucedanum grande* C.B Clarke) and its Scientific Report

Mehar Adiba<sup>1</sup>, Najeeb Jahan<sup>1</sup> and Tabarak Hussain<sup>3</sup>

<sup>1</sup>Dept of Ilmul Advia, NIUM, Bangalore, INDIA

<sup>2</sup>Dept of Ilmul Advia, HMSUMC, Tumkur, INDIA

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### Abstract

Plants have played a vital role in the prevention and treatment of diseases since prehistoric times. WHO estimates that 65%-80% of the world's population use traditional medicines, as their primary form of health care and most of the diseases have been treated by administration of plant or plant products. *Duqu* (*Peucedanum grande* C.B Clarke) is most useful herbal medicinal plant remove these words its fruits possess medicinal property. During the last few years the phytochemistry of the *Duqu* is been achieved regarding the biological activity and its medicinal applications. It is now considered as a natural product for development of medicines against various diseases and also for the development of industrial products. This review, gives a keen view on its biological activities, pharmacological actions, medicinal application, safety evaluation and its isolated compounds.

**Keywords:** *Peucedanum grande*, *Duqu*, Unani medicine.

### Introduction

*Peucedanum grande* C.B. Clarke is commonly known as *Duqu* and is native to Europe, Asia, North East Africa, South West America, Iran and India. It belongs to the family Apiaceae earlier known as Umbellifereae<sup>1</sup>. Ibn Sina has mentioned in his book *Al Qanoon Fil Tib* (Canon of Medicine) that *Duqu* are the seeds of wild carrot<sup>2</sup>. Ibne Rushd has mentioned in his book *Kitabul Kulliyath* that *Duqu* is wild carrot and its roots are used medicinally<sup>3</sup>.

**Taxonomical Classification**<sup>1</sup>: Kingdom: Plantae, Sub kingdom: Tracheobionta, Super division: Spermatophyta, Division: Magnoliophyta, Subclass: Rosidae, Order: Apiales, Family: Apiaceae, Genus: *Peucedanum*, Species: *grande* C.B Clarke.

**Vernacular Names:** *Duqu* (fruit of *Peucedanum grande* C.B. Clarke) is known by different names worldwide including Indian sub continent as follows: Persian: *Tukhme Gazar Dashti*<sup>4</sup>, Hindi: *Duku*<sup>5</sup>, Arabic: *Bazar Jazarul Buri*<sup>4</sup>, Urdu: *Duqu*<sup>2, 3, 6, 7</sup>, Tamil: Carrot Kalung<sup>8</sup>, English: Wild Carrot<sup>1</sup>, Queen Anne's lace, Bird's Nest<sup>8</sup>, Sanskrit: Baspika, Ela<sup>9</sup>, Bombay: Baphali<sup>5</sup>, Gujarat: Baphali<sup>10</sup>

**Habitat and Distribution**<sup>1</sup>: It is commonly found in Europe, Asia, North East Africa, South West America and Iran. In India it is found on the Western Ghats and the hills of Deccan plateau.

**Botanical Description:** *Duqu* (*Peucedanum grande* C.B. Clarke) is a succulent herb, belongs to the family Apiaceae earlier known as Umbellifereae. It is about a meter in height;

roots are large perennial; stem is fistular, emitting strong scent on crushing; leaves are pinnate or bipinnate, mostly radical (figure 1), flowers are yellow compound umbels (figure 2), fruits (mericarps) are obovate or broadly elliptical, 10-13 mm long, narrow winged, reddish yellow having powerful lemon-like odour and are used in medicine (figures 3, 4). The fruits yield a small quantity of light yellow essential oil having a strong odour of carrot oil<sup>1</sup>.

### Description of *Duqu* as Reported in Unani Literature

*Duqu* was known to Unani physicians since very long time and Sheik, in his book *Al Qanoon Fil Tib* describes it as seeds of wild carrot<sup>2</sup>. Allama Najmul Ghani, in his book *Khazainul Advia* describes that *Duqu* is an herb of about one meter tall, leaves are like fennel leaves, flowers are yellow colored and arranged umbel shape resembling coriander, taste is sour with some specific odour. Roots are finger like and tastes like carrot<sup>11</sup>. Hakim Abdul Hakim in his book *Bustanul Mufradat* describes that leaves of *Duqu* resemble carrot leaves, flowers are yellow colored and umbel shaped<sup>12</sup>. In *Moghzanul Mufradath*, Hakim Kabiruddin has mentioned that *Duqu* are the seeds of wild carrot, resembling ajwain odour and taste is sour. *Duqu* plant is about 1-2metre tall in height; roots are like fingers and taste is like carrot<sup>13</sup>. Hakim Naseer Ahmed Tariq in his book *Tajul Mufradat* describes *duqu* as a plant of half meter tall in height like fennel plant, roots are like fingers and taste is like carrot, flowers are yellow colored and umbel shaped<sup>4</sup>. In *Unani Adviyae Mufarrada* Hakeem Syed Saifuddin Ali describes it is a 1-1.5 meter tall herb, roots are long, flowers are umbel shaped,

yellow colored. Fruits are 10-12mm long reddish yellow colored. Because of their small size fruits are called as seeds, which are used medicinally<sup>6</sup>.

## Part Used Medicinally

Ibne Rushd in his book *Kitabul kulliyath* has mentioned that roots of *Duqu* are used medicinally<sup>3</sup> and Hakeem Syed Saifuddin Ali in his book *Unani adviae mufarrada*, says that fruits are used medicinally and have been reported to possess important biological properties<sup>1,6</sup>.

**Temperament:** Hot and Dry<sup>6,14</sup>, Hot 3° and Dry 2°<sup>4,12,13</sup>, Hot 3° and Dry 1°<sup>2</sup>.

**Pharmacological actions**<sup>2,4,6,7,11-17</sup>: *Daaf-e-Sammyat* (Antidote), *Kasir Riyah* (Carminative), *Mulattif* (Demulcent), *Muarriq* (Diaphoretic), *Muhallil Warm* (Anti-Inflammatory), *Muharrik* (Stimulant), *Munaffis Balgham* (Expectorant), *Mufatteh Sudud* (Deobstruent), *Mufatit Hissat* (Lithotriptic), *Munziz* (Maturative), *Mudir Baul* (Diuretic), *Mudir Haiz* (Emmenagogue), *Mugalliz Mani* (Spermatogogue), *Muallid Mani* (Semen Procreator), *Muqawi Meda* (Gastric Tonic), *Muqawi Bah* (Aphrodisiac), *Qatil Deedan Ama* (Anthelmintic), etc.

## Therapeutic Uses

The fruit of *Duqu* (*Peucedanum grande* C.B. Clarke) which are used medicinally are confounded as seeds due to their small size<sup>6</sup>. In Unani System of Medicine, the fruit of *Duqu* is used as a medicine in various forms like decoction, powder, syrup etc for different ailments. These fruits possess different pharmacological activities and hence used by Unani Physicians as deobstruent, stimulant, gastric tonic, carminative, diuretic, anthelmintic, aphrodisiac etc<sup>2,4,6,11,12,13,14,18</sup>.

## Gastro-intestinal tract

*Duqu* possess carminative and diuretic properties, hence used in the treatment of *nafakh shikam* (flatulence) and *sudda kabidi* (hepatic thrombosis). It is also used in the treatment of intestinal worm infestation<sup>2,4,11-14</sup>.

## Urogenital System

The powder of *Duqu* is said to be a potent medicine as diuretic and emmenagogue<sup>6,14</sup>. It also expels the stones of kidneys and bladder. The powder of *Duqu* with honey is used in the treatment of sexual debility<sup>2,4,13,14</sup>.

## Respiratory System

*Duqu* possess *munaffis balgham* (expectorant) property. Hence it is used as an expectorant in the form of powder with honey<sup>12,14</sup>.

**Poisoning:** It is documented that *Duqu* possess antidote property. Hence the decoction of *Duqu* is taken orally and paste of honey with *Duqu* is applied over the site of bite of poisonous animals<sup>11,12</sup>.

**Adverse Effect:** The drug *Duqu* has been mentioned to be used with caution in patients with hot temperament<sup>4,11,13</sup>.

**Correctives:** *Gonde babool* (*Acacia arabica*)<sup>13</sup>, *Tabasheer* (*Bambusa arundinacea*), *Mastagi* (*Pistacia lentiscus*), *Baloot* (*Quercus alnifolia*)<sup>11</sup>.

**Substitutes:** *Tukhme karafs* (*Apium graveolens* Linn)<sup>4,13</sup>, *Ajwain Desi* (*Carum copticum*), *Anesoon* (*Pimpinella anisum*)<sup>11</sup>.

**Dose:** 1-2 grams seeds<sup>12</sup>, 3-5 grams fruits/ seeds<sup>4,13,14</sup>.

**Unani Compound Formulations:** It is used as a main ingredient in the compound formulation of *Majoone buqratiya*<sup>19</sup> and in many poly herbal formulations which are being used for the treatment of urinary calculi, hepatic obstruction<sup>17,20,21,22</sup>, as an aphrodisiac<sup>17</sup>.

**Description of *Duqu* (*Peucedanum grande* C.B. Clarke) as given in Modern Literature:** The modern description of *Duqu* can be studied under the following categories:

**Geographical Distribution:** *Duqu* is a succulent herb, about a meter or more in height occurring gregariously on the Western Ghats and the hills of Deccan plateau, belongs to Apiaceae, Umbelliferae family. Its ten species are found in India<sup>23</sup>.

**Macroscopic Features:** Roots are large, woody, perennial; stem is fistular, erect and grooved emitting strong scent on crushing; leaves are pinnate or bipinnate, mostly radical; flowers yellow compound umbels; fruits (mericarps) obovate or broadly elliptical, 10-13 mm long, narrow winged, reddish yellow having powerful lemon-like odour, irritant and bitter in taste. The glabrous dorsal surface shows three prominent ridges and two lateral wings. The fruits yield a small quantity of light yellow essential oil having a strong odour of carrot oil<sup>1,7, and 23</sup>.

**Microscopic Features:** The microscopic characters of *Duqu* generally resemble the structure of an umbelliferous fruit having a tubular epicarp followed by a fibrous mesocarp in the ridge region and an endocarp which shows a parquety arrangement in surface view. The number of vittae in the mesocarp is variable, usually 7-8 on dorsal and 4-6 on ventral surface. The endosperm contains aleurone grains and oil<sup>1</sup>. Each mericarp has four vittae on dorsal surface and two vittae on commissural surface. The outer epidermis has prominent cuticle and the mesocarp contains lignified reticulate parenchyma below each ridges. The endosperm is much flattened cells. The cells of the embryo are smaller in size as compared to endospermic cells. Prominent raphe is present in the embryo. The testa consists of parenchymatous cells containing fixed oils and aleurone grains.

The microscopic characters generally resemble the structure of an umbelliferous fruits having tubular epicarp followed by fibrous mesocarp in the ridge region and endocarp which shows a parquety arrangement in surface view<sup>7</sup>.

**Powder study of *Duqu*:** The epicarp of *Duqu* is composed of a layer of fairly well defined, colourless cells with uniform well marked cuticular striations; in surface view the cells are variable in shape with thin walls. The brown fragments of the vittae are not very numerous, composed of thin walled cells, polygonal in surface view sclereids of the mesocarp, these occurs in groups composed of fairly thick walled cells surface to rectangular in outline with numerous small and conspicuous pits, they are fragment found associated with epicarp. The occasional groups of reticulate parenchyma of the mesocarp composed of elongated cells with fairly thick, lignified walls. The fragments of fibro-vascular tissues composed of small groups of fibers and vessels showing spiral and annular thickening<sup>7</sup>.



Figure-1  
Leaves



Figure-2  
Umbel Shaped Flowers



Figure-3  
Fresh Fruits



Figure-4  
Dry Fruit

## Scientific Studies

**Phytochemical Studies:** i. *Duqu* reported to possess different types of chemical constituents such as Carbohydrates, Phenolic compounds, flavonoids, proteins and amino- acids, lipids / Fats and heavy metals such as Arsenic, Mercury, Lead, Cadmium etc, which were found within the permissible limits as prescribed by the WHO. ii. The hexane extract of the roots of *duqu* yielded two coumarins viz., osthol and imperatorin, while the acetone extract yielded another coumarin, byakangelicin. The extraction of seeds of *Duqu* with petroleum ether led to the isolation of a rare coumarin, columbianadin and two furocoumarins viz., imperatorin and byakangelicin. The seeds appeared to be the rich source of byakangelicin. Two more compounds were isolated, the spectral data of one of them being comparable to that of 5, 8-dimethoxy psoralene, while the other was not characterised. iii. The acetone extract of the seeds also reported to yield imperatorin and osthol<sup>1,7</sup>. iv. Development of quality standards and phytochemical analysis of *Peucedanum grande* C.B. Clarke<sup>7</sup>. v. Phytochemical investigations of the methanolic extract of the fruits of *Peucedanum Grande* C. B. Clarke (Apiaceae) led to the identification of three coumarins and a naphthyl labdanoate diarabinoside characterized as 5-hydroxy-6-isopranyl coumarin, 5,6-furanocoumarin, 7-methoxy-5,6-furanocoumarin and labdany 1-3 $\alpha$ -ol-18-(3'''-methoxy-2'''-naphthyl-oate)-3 $\alpha$ -L-arabinofuranosyl-(2'  $\square$  1'')- $\alpha$ -L-arabinofuranosid<sup>24</sup>.

**Pharmacological Reports:** i. Methanolic extract of *Peucedanum grande* is reported to possess nephroprotective activity against mercuric chloride induced acute renal failure and oxidative stress in Wistar rats<sup>16</sup>. ii. Methanolic extract of *Peucedanum grande* is reported to possess nephroprotective activity against cadmium chloride induced renal toxicity in Wistar rats<sup>15</sup>. iii. The methanolic extract of *Peucedanum grande* and labdanyl-3 $\alpha$ -ol-18-(3'''-methoxy-2'''- naphthyl-oate)-3 $\alpha$ -L-arabinofuranosyl-(2'  $\square$  1'')- $\alpha$ -L-arabinofuranoside reported to possess nephroprotective activity against gentamicin induced nephrotoxicity in Wistar rats<sup>24</sup>.

## Conclusion

The information regarding the herbal Drug *Peucedanum grande* C.B Clarke is in accordance with the literature available in both

Unani and modern books and also the publications reports available online. Since past decade the natural compounds and the herbal medicine has received more attention towards their scientific development with respect to safety and efficacy. This is a classical approach to explore novel medicines for various diseases affecting human beings worldwide. *Peucedanum grande* C.B Clarke is such an herbal drug which is being used by Unani, Ayurveda and the traditional practitioners. Some of the therapeutic properties of it are been already explored by the researchers and many are yet to be explored.

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