Short Communication

Monograph of *Apium graveolens* Linn.

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*Apium graveolens* has been used in Unani system of medicine as anti-inflammatory, uricosuric, diuretic and to treat rheumatism besides other ailments. The description, active constituents, medical uses *A. graveolens* are described herewith.

Key words: *Apium graveolens*, active constituents, medicinal activity.

INTRODUCTION

*Apium graveolens* Linn. (Apiaceae) is commonly known as Celery (Norman et al., 2001). In India Celery plant is native in Punjab, Himachal Pradesh and Uttar Pradesh states. It is commonly found in foot hills of Himalayas (Pulliaah, 2006; Nadkarni and Nadkarni, 1976; Singh et al., 1995). It is an erect, annual or biennial herb. The roots are numerous, succulent and well developed. The stem branches are angular or fistular, and are conspicuously jointed. The leaves are oblong to obovate, pinnate or trifoliolate. The leaflets are ovate to sub-orbicular and 3-lobed. The flowers are white or greenish white and very small. The fruit is a schizocarp consisting of two mericarps, sub-orbicular to ellipsoid, greyish brown to brown with pale ridges, aromatic and slightly bitter. The seed and flowering shoots are shown in Figures 1 and 2 (Teng et al., 1985).

*Apium graveolens* Linn.

**Tibbi name:**   Ajmud, Krafs
**English name:**   Celery
**Botanical name:**   *Apium graveolens*
**Family:**   Umbelliferae
**Synonym:**   *Apium petroselinum* Linn

Part used: Seeds

Objective

To review the published literature on *A. graveolens*

METHODOLOGY

Relevant articles were searched using the terms *A. graveolens*, active constituents, medicinal and pharmacological activity.

Active constituents

Isoimperatorin, isoquercitrin, linoleic acid, magnesium, p-cymene, phosphorus, guaiacol, silicon, terpinene-4-ol, 3-N-butyl-phthalide, umbelliferone, Vitamin A, C, B, apioil, zinc. Volatile oil, containing d-limonene, with a-selinene, santalol, a and b eudesmol, dihydrocarvone. Phthalides, ligustilide, sedanolide, and sedanenolide, bergapten, isopimpinellin, apiumoside and celeroside (Garg et al., 1980). 3-butyl-4,5-dihydrophthalide, coumarins (seselin, osthenoil, apigravin, celerin), furanocoumarins (including bergapten), flavonoids (apigenin, apiin), phenolic compounds, choline and unidentified alkaloids. The essential oil contains deltalinomone, various sesquiterpene. Celery is rich in beta-carotene and folic acid.

Celery leaves

It consist of moisture 88.0%, protein 6.3%, fat 0.6%, minerals 2.1%,
of symptoms of such conditions as arthritis, rheumatism and hyperuricemia. Various pharmacological activities attributed to the seed or essential oil include antispasmodic, mild sedative, and anti-inflammatory activity. The seeds and stalks are utilized as spasmodic, carminative, anti-inflammatory, antirheumatic, sedative, hypotensive, and urinary antiseptic agent (Tsi et al., 1997). Seeds of the wild celery plant, A. graveolens are employed as a traditional medicine in India and other countries adopting Ayurvedic traditions for healing, being used as a tranquilizer, antispasmodic, nervous, diuretic, and antirheumatic (Kapoor, 1990).

RESULTS

Differentiating cross-reacting allergens in the immunological analysis of celery (A. graveolens) by mass spectrometry

Celery is acknowledged as a major food allergen in Europe, and mandatory labeling for preprocessed foods has been implemented. In one study, sandwich celery ELISA using polyclonal anticeley antibodies for capture and detection was developed and validated. The method has an LOD of 0.5 mg/kg in buffer; however, it is applicable only for the screening of food products because of extensive cross-reactivity with potato and carrot proteins. Using nanoLC-ion-trap MS/MS, a number of proteins in the three vegetable species were identified as candidates for causing cross-reactions due to amino acid sequence homologies. Among others, a novel patatin (Sola t 1)-like protein was detected in celery and a flavin adenine dinucleotide binding domain-containing protein (Api g 5)-like protein was identified in carrot. The utility of triple-quadrupole MS/MS for specific and quantitative analysis of celery, potato, and carrot allergens was evaluated using whole protein extracts. Several unique precursor ion-to-product ion transitions were determined for each species, suggesting the feasibility of developing an MS-based screening method to specifically detect celery allergens in foods (Faeste et al., 2010).

Pharmacological activity

The clinical study was conducted on Gouticin (Herbal coded tablet) that contains different medicinal herbs including A. graveolens, used as analgesic in Gouty arthritis. Study was conducted in Shifa ul Mulk Memorial Hospital, Hamdard University, Karachi. The drug was prescribed to 50 patients between ages of 35 years to 75 years. The selected drug was administered to attain a successful response to gout. Clinical study of A. graveolens shows that it exhibits the anti-inflammatory effects. It was concluded that Gouticin is remarkably effective for the treatment of acute gout and arthritis (Akram, 2009). In another study an herbal drug arthritin containing different medicinal herbs including A. graveolens was evaluated in comparison with methotrexate for the treatment of rheumatoid arthritis. Study was conducted in
Shifa ul Mulk Memorial Hospital, Hamdard University, Karachi. Herbal formulation arthritin was administered to 50 patients. Clinical study shows that arthritin exhibits the anti-inflammatory effects. It was concluded that Apium graveolens is effective for the treatment of rheumatoid arthritis (Owais, 2009).

**DISCUSSION**

Seeds of Apium graveolens L. (Apiaceae) are used in Indian systems of medicine for the treatment of liver ailments. The antihapatotoxic effect of methanolic extracts of the seeds of this plant has been studied previously (Anubha et al., 1995). The antimicrobial activity of the essential oil of this plant was assayed in vitro against Helicobacter pylori (strain DSMZ 4867), resulting in a minimum inhibitory concentration value of 12.5 μg/ml (Luigi et al., 2010). Apium graveolens is an ingredient of eight of the thirty-three Indian polyherbal formulations with reputed liver-protecting activity (Handa et al., 1986). Apium graveolens is also anti-inflammatory and uricosuric (Chopra et al., 1956). Apium graveolens is hepatoprotective (Ahmed et al., 2002). Anti-nociceptive and anti-inflammatory effects of Apium graveolens have been studied previously (Atta et al., 1998). Celery allergy has been confirmed by a clinical study in 32 subjects previously (Ballmer et al., 2000). Apigenin has been isolated from Apium graveolens that has vasodilatory action (Ko et al., 1991). Mosquitocidal, nematicidal and antifungal compounds from Apium graveolens L. seeds have been reported (Momin et al., 2001; Appel and Moore, 1997), while Apium graveolens has been prescribed for the treatment of high blood pressure (Appel et al., 1997). Apium graveolens L. is considered as antispasmodic and carminative (Friedman et al., 1986).

**Conclusion**

The pharmacological activities are anti-inflammatory, uricosuric, diuretic and for the treatment of rheumatoid and osteoarthritis has been documented. Although it exerts effects on liver, exhibits hepatoprotective activities and involved in gouty arthritis therapy. In conclusion Apium graveolens has wide range of medicinal uses and can be used either as single drug or compound drugs to treat different ailments.

**REFERENCES**


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