EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 6
Issue: 6
185-188
Year: 2019

A REVIEW ON PHARMACOLOGICAL ACTIONS OF *CUCURBITA MAXIMA*

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Article Received on 03/04/2019 **Article Revised on 24/04/2019** **Article Accepted on 14/05/2019**

ABSTRACT
C. maxima is an annual herb with thick climbing or creeping stems. The oval seeds can be white, cream, orange, or brown, and are composed of 34-54% oil. They are also packed with tryptophan and essential fatty acids. Pumpkins are grown all around the world for a variety of reasons. The pumpkin (*Cucurbita maxima*) is grown extensively during monsoon and summer season across India. Pumpkin seeds contain many valuable functional components and have been traditionally used for herbal, therapeutic as well as clinical application. Pumpkin seeds represent a potent functional food against heart disease, osteoporosis, bladder dysfunction, anxiety, and arthritis. On the basis of its usage in folk medicine and presence of tryptophan required for treatment of anxiety, it is hypothesized that *Cucurbita maxima* seeds may possess antianxiety property. However, no scientific data are available in the published form. Hence the seed of the pumpkin is selected for the evaluation of antianxiety study.

KEYWORDS: *Cucurbita maxima*, Anthelmintic, Immunomodulator.

INTRODUCTION
Pumpkin (*Cucurbita maxima*) belongs to the family cucurbitaceae. It is a leafy green vegetable. They are variable in size, color, shape, and weight. They have a moderately hard rind, with a thick, edible flesh below and a central seed cavity. There are numerous seeds in the fruit. Most seeds are plump and tan or soft white. They are all covered with a testa that serves as a protectant around the seeds. The pumpkin orange flesh is eaten for human consumption such as soup, purees, jams, and pies throughout the world. Food companies are experimenting with their incorporation into a slew of savouries and consumers are showing interest in them. Also, their beneficial effects on blood glucose level, immunity, cholesterol, liver, prostate gland, bladder, depression, learning disabilities and parasite inhibition are being validated. The conversion of these agro-wastes into value-added ingredients is likely to be a big step towards the global sustainability efforts.[1]

AVAILABILITY
The origin of pumpkin is not definitively known, although they are thought to have originated in central Africa as far back as 7000-5500 B.C. Pumpkins are grown all around the world for a variety of reasons ranging from agricultural purposes (such as animal feed) to commercial and ornamental sales. Of the seven continents, only Antartica is unable to produce pumpkins. The biggest international producers of pumpkins include the United states, Canada, Mexico, India and China. The pumpkin (*Cucurbita maxima*) is grown extensively during monsoon and summer season across India.

Pumpkin prefers a well drained sandy soil with high organic matter. Pumpkin is cultivated in warm -season annual preferring high temperature and they need 90 to 120 hot days to reach maturity.[2]

PLANT
It is an annual herb with thick climbing or creeping stems belong to the family *Cucurbitaceae*. It belong to the species *cucurbita maxima.*

SEED


The seeds, which are attached to the ovary wall (parietal placentation) and not to the center, are large and fairly flat with a large embryo that consists almost entirely of two cotyledons. Seeds are numerous, 1.7–2 x 0.7-1.1cm in dimensions. ovate, with an angular and raised side. smooth, yellow, fine waved and shiny surfaced. Hilum is conspicuous, terminal, and white base rounded. The epidermal cells of the seed coat are glebulate. The anticlinal walls are raised and usually 4-5 gonal, straight with irregular channels. The outer periclinal walls are convex with delicate furrows.

CHEMICAL CONSTITUENTS

Pumpkin fruits have many nutritional components including polysaccharides, proteins, essential amino acids, valuable antioxidants, carotenoids and minerals. Pumpkin seeds contain 11 to 31% unsaturated fixed oil and total unsaturated fatty acid content ranged from 73 to 81%. The seeds also contain cucurbitacins, vitamins, and Minerals, notably zinc. Pumpkin Seeds contain iron, B vitamins, and trace minerals .They are also packed with tryptophan and essential fatty acids. The fairly high concentration and the wide spectrum of the amino acids detected in the seed kernels.

Pumpkin seed kernels contained moderate concentrations of minerals. Although only fair amounts of copper and zinc were present, pumpkin seed kernels were good sources of some other minerals, especially P, K and Mg.[3] The presence of high amounts of the essential linoleic acid suggests that the pumpkin seed oil is highly nutritious. As the pumpkin seed oil is rich in both oleic and linoleic acids, it may be used as edible cooking and salad oils or for margarine manufacture.

THERAPEUTIC USES

Pumpkin seeds represent a potent functional food against heart disease, osteoporosis, bladder dysfunction, anxiety, and arthritis. Pumpkin seed oil has been found to alleviate diabetes by promoting hypoglycemic activity.

Kidney stone

The antioxidants present in pumpkin seeds (which act as diuretics), have been known to combat toxicity in the body. Through these activities, the pumpkin seed prevents the accumulation of uric acid in the body in the form of kidney stones.

Hypolipidaemic effect

The consumption of pumpkin seed mixtures resulted in a significant decrease in lipid parameters suggesting the anti-atherogenic potential of the seed mixture.[4]

PHARMACOLOGICAL ACTIVITIES

1. Anticarcinogenic

Diets high in pumpkin seeds are associated with lower risk of gastric, breast, lung and colorectal cancers. There are also potential health benefits, including anti-carcinogenic effects, to be gained from the various carotenoid pigments found in pumpkin seed oil. The carotenoids from pumpkin fruits have been linked to the prevention of prostate cancer. The consumption of sunflower and pumpkin seeds was associated with significantly reduced postmenopausal breast cancer risk.[5]

2. Antidiabetic

Various studies for the anti-diabetic potential of pumpkin is reported that, it is a normally cultivated plant in farms and its fruits are used for human consumption in diabetic conditions. Local healers recommend the ingestion of crude aqueous extract of pumpkin fruits for the treatment of type 2 diabetes or non-insulin-dependent diabetes mellitus. D-chiro-Inositol was identified in pumpkin and this compound has been considered as an insulin action mediator. However, the detailed mechanism of antidiabetic action of this component remains to be clarified. Various other components have also been isolated from pumpkin and used for anti-diabetic action.[6]

3. Antimicrobial and Antifungal effects

Pumpkin seed oil has been shown to exhibit antimicrobial activity. Pumpkin extracts showed a broad spectrum antimicrobial activity against several bacteria. Un-irradiated pumpkin seeds were effective against Rhodotorula rubra and Candida albicans.[7]

4. Treats Arthritis and Reduces Inflammation

Arthritis is a debilitating condition, which needs to be treated in time to stop its effects from wearing the body down. Treatment requires adding a healthy amount of proteins and anti-inflammatory compounds. Studies have revealed that pumpkin seeds have anti-inflammatory properties. There is a direct correlation between reduced arthritis-related joint pain and the consumption of pumpkin seeds. The beta-carotene in pumpkin seeds has anti-inflammatory properties and regular consumption of pumpkin seeds can protect against joint inflammation.[8]

5. Diuretic Activity

The seeds of *Cucurbita maxima* are used traditionally as diuretics and other urinary diseases. The concentration of Na+ and K in urine was determined by flame photometer. The aqueous extract of seeds of *Cucurbita maxima* showed significant increase in urine volume when compared to control group. But the excretion of Na+ and K+ in urine was not significantly increased in drug treated group when compared to control group. The aqueous extract of *Cucurbita maxima* showed significant diuretic activity.[9]

6. Antiobesity Activity

Cucurbita maxima seed is effective for reducing fats individually as well as its combination effort through different mechanism. It is used to flush out fats from the system and used to regulate thyroxine. *Cucurbita maxima* seed sample having tendency to produce thyroxine to regulate fat in body, is additionally benifited

with Beta vulgaris which flush out fat from tissue and blood corpuscle.[10]

7. Immunomodulator

In addition to the zinc and iron in pumpkin seeds, which are both vital for immune function, pumpkin seeds possess anti-fungal and anti-viral properties. Pumpkin seeds are also not a common trigger of allergies and intolerances. The antigenotoxic constituent of squash flowers was isolated by solvent partitioning and repeated vacuum liquid chromatography. The flower of Cucurbita maximus contains several sterols which are responsible for the antinogenic activity.[11]

8. Antihypertensive and cardioprotective effect

Pumpkin seeds play an important role in relaxing vessels and lowering blood pressure. The high magnesium content is credited to reducing the risks of heart attack. The seed supplements have shown comparable efficiency to the calcium channel blocker prescription drug amlodipine.[12]

9. Gynaecological effect

Phytoestrogens are plant metabolites with structural and functional similarity to 17b-estradiol, recognized to lower the risk of osteoporosis, heart disease, breast cancer and menopausal symptoms. Pumpkin seed oil has been discovered to be as rich in phytoestrogens The pumpkin seed oil showed a significant increase in high-density lipoprotein and decrease in diastolic blood pressure in women who had undergone menopoause. A decrease in the severity of hot flushes, less frequent headaches and less joint pains were reported in the pumpkin seed oil administered women. The positive response warrants further probing into the menopause remedial effects of pumpkin seeds.[13]

10. Anthelmintic

Pumpkin seeds are used as a natural treatment for parasites. Several Native American tribes used it to get rid of internal worms. The seeds were found to be beneficial in cases of acute schistosomiasis, a type of parasite contracted from freshwater snails that causes fever, chills, headache, fatigue and intense gastrointestinal discomfort. Cucurbitine, an amino acid and carboxypyrrolidine (structural similarity with proline) found in the seed was found to be the active anti-worming agent.[14]

CONCLUSION

In conclusion pumpkin seeds has several chemical constituents so that pumpkin seeds represent a potent functional food against heart disease, bladder dysfunction, anxiety, and arthritis. Pumpkin seed oil has been found to alleviate diabetes by promoting hypoglycemic activity.

Apart from the validated medicinal properties, pumpkin seeds hold other health-restorative prospects. They are anticipated to avoid kidney stones, treat incontinence, drive away depression, prevent osteoporosis, promote ocular health, nourish skin etc.; however, there are insufficient studies in these directions. More clinical trials are required to appreciate and utilize the optimal nutritional potential of pumpkin seeds.

REFERENCES

1. Ferriol, M., B. Picó, & F. Nuez 2004. Morphological and molecular diversity of a collection of Cucurbita maxima landraces. J. Amer. Soc. Hort. Sci., 129(1): 60-69.
2. Hoyam Hashim Siddig Ahmed, Dr. AbdAllah M. Alhassan: Pharmacognostical Investigation of *Cucurbita maxima*, *Cucurbitaceae* (Pumpkin) Fruits, Leaves, seeds, flowers, 2017: 23-25.
3. Sarvesh Dhar Dubey. overview on Cucurbita maxima, *Hygia Institute of Pharmaceutical Education and Research, Lucknow International Journal of Phytopharmacy Review Article, May-Jun 2012; 2(3): 68-7.*
4. Barakat LA, Mahmoud RH (2011) The antiatherogenic, renalprotective and immunomodulatory effects of purslane, pumpkin and flax seeds on hypercholesterolemic rats. North Am J Med Sci., 3: 411–417.
5. Huang XE, Hirose K, Wakai K, et al. Comparison of lifestyle risk factors by family history for gastric, breast, lung and colorectal cancer. Asian Pac J Cancer Prev., 2004; 5: 419-427.
6. Xia T, Wang Q. D-chiro-Inositol found in Cucurbita ficifolia (Cucurbitaceae) fruit extracts plays the hypoglycaemic role in streptozocin-diabetic rats. J Pharm Pharmacol, 2006; 58: 1527-1532.
7. Rajakaruna N, Harris C, Towers G. Antimicrobial Activity of Plants Collected from Serpentine Outcrops in Sri Lanka. Pharmaceutical Biology, 2008; 40(3): 235-244.
8. Seo JS, Burri BJ, Quan Z, Neidlinger TR. Extraction and chromatography of carotenoids from pumpkin. J. Chromatography A., 2005; 1073: 371-375.
9. Jose, M. A. et al. Diuretic activity of seeds of Cucurbita maxima duchesne in albino wistar rats. Indian J Pharmacol, 2008; 40(8): 72-80.
10. Das, R. et al. Potentiative Activity Of Cucurbita Maxima Seed Extract With Beta Vulgaris & Smilax Regelii Root Extract To Reduce Extra Fats From The Body. International Journal of Pharmaceutical Sciences and Research, 2010; 1: 57-62.
11. Villasefior, M.I., Lemon, P. Antigenotoxic spinasterol from Cucurbita maxima flowers. Mutation Research, 1996; 360: 89-93.
12. El-Mosallamy AE, Sleem AA, Abdel-Salam OM, Shaffie N, Kenawy SA (2012) Antihypertensive and cardioprotective effects of pumpkin seed oil. J Med Food, 15: 180–189.
13. Zaineddin AK, Buck K, Vrieling A, Heinz J, Flesch-Janys D, Linseisen J, Chang-Claude J (2012) The association betweendietary lignans, phytoestrogen-rich foods, and fiber intake and postmenopausal

breast cancer risk: a German case–control study. Nutr Cancer, 64: 652–665.

14. Raoul F, Giraudoux P (2012) Use-fulness of pumpkin seeds combined with areca nut extract incommunity-based treatment of human taeniasis in northwest Sichuan Province, China. Acta Trop, 124: 152–157.