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Review Article

Phyto-Pharmacological Aspects of *Cucumis melo* var. *agrestis*: A Systematic Review

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ABSTRACT

Cucumis melo var. *agrestis*, belongs to the family Cucurbitaceae, is commonly known as wild melon, wild musk, small gourd, kachri or chibber. It is annual climber, monoecious, plant having thin stemmed and fruit with thin mesocarp and tiny seeds. Fruit possess variability in various morphological aspects. All the essential nutrients are present in adequate amount, so it is usually consumed as vegetable. Fruits are used as cooling light cleanser or moisturizer for skin and first aid treatment for burns and abrasions. It also possesses stomachic, digestive, febrifuge, vermifuge properties and show antioxidant, analgesic, anti-inflammatory activity. In this review we gave all-purpose outline of phyto-pharmacological aspects of *Cucumis melo* var. *agrestis*.

Key words: Phyto-pharmacological activity, *Cucumis melo,* Catechin, Wild melon, Kachri, Chibber.

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INTRODUCTION

Plants synthesis various remedial constituents are naturally gifted to organisms, whose characterization has led to innovation of novel, contemptible drugs with high medicinal values.[1,2] Due to presence of these phytoconstituents, plants show defense mechanism pathogen attack, herbivory, inter-plant competition and against the abiotic stresses.[3,4] *C. melo* var *agrestis* have many phytoconstituents such as Alkaloids, tannins, flavonoids, carbohydrates, proteins, glycosides, steroids, triterpenoids and phenolic acids which are responsible for therapeutic potential. It belongs to family Cucurbitaceae, commonly known as small gourd, wild melon, wild musk, chibber or kachri. It is native to Africa, tropical America and Southeast Asia. It grows as weed in African and Asian Countries.[5] In India, it is widely distributed among the all regions, ranging from Punjab, Himachal Pradesh, Haryana, Rajasthan to Kerala and in southern parts of India.[6] In Punjab, it is distributed all over the state with more prevalence in arid zone and sandy areas (Bathinda, Mansa, Abohar, Faridkot, Firozpur, Sri Mukatsar Sahib). It requires rich, well-drained soil and hot arid conditions and sunny locations. The wild *Cucumis* species have very great economic importance, as they are source to many useful genes for numero us yield related agronomic traits, such as disease resistance and biotic stress resistant.[7] Fruits are used as vegetable or medicine by rural people to cure many diseases.[8] It is also used for the purpose for moisturizing, cleaning the skin and treatment for abrasions and burns. It is also used as a cooling light cleanser or moisturizer for the skin and first aid treatment for burns and abrasions[9] and also possesses the stomachic properties.[10] It contains huge quantity of seeds, which possess therapeutic properties such as antitissuie, antioxidant, digestive, febrifuge and vermifuge.[11]

PLANT TAXONOMY

Kingdom - Plantae
Division - Magnoliophyta
Class - Magnoliopsida
Order - Cucurbitales
Family - Cucurbitaceae
Genus - *Cucumis*
Species - *melo*
Variety- *agrestis*

VERNACULAR NAMES

Vernacular names of *C. melo* var. *agrestis* in several languages are given in Table 1.[12]

HISTORICAL BACKGROUND AND TAXONOMICAL PROFILE

According to synthesis of a large quantum of new genetic and archaeological evidences, over the past decade, archaeobotanists have presumed that the process of domestication is protracted and diffuse process, progressing parallel in direction of various locations around the Near East.[13,14] According to archaeological evidences, melons were prevalent in Egypt, Arabia, India and China by 2000 BC. Wild populations of *C. melo* range from Africa, Australia,

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Table 1: Vernacular Names of *C. melo* var. *agrestis* in several languages.

English	Wild musk melon, small gourd
Hindi	Kachari
Danish	Agruk
Telugu	Dosakaya
Japanese	Kyuri
Chinese	Huángga
Spanish	Pepino
Malayalam	Velarikka

southern Asia, Pacific Islands to hot regions of the Americas.[15] For most of *Cucumis* species, Africa is assumed as the center of origin, including *C. melo*.[15] The origins of melon domestication might be multiple, with one lineage of cultivars coupled with wild populations in Western Asia (on basis of long and spreading hair present on ovary, these together classified as sp. melo) and a second lineage coupled with Central and Eastern Asian populations (on basis of short and appressed ovary hairs, these classified as sp. *agrestis* (Naudin) Pangalo.[16] Over the past 150 years, many intraspecific classifications of *C. melo* have been proposed. Pitrat *et al.* (2000) outlined these classifications in detail. The genus *Cucumis* includes two major commercial and widely cultivated vegetable crops *viz*. Cucumber (*Cucumis sativus*) and Melon (*Cucumis melo*).[17] In recent classifications seven melon varieties of *C. melo* have been reported by Munger and Robinson (1991), using description by Naudin, 1859 and Hammer *et al*. 1986.[5,18,19] These varieties are *C. melo* var. *agrestis* (Kachri, Chibber, wild melon), *C. melo* var. *cantalupensis* (Netted melon), *C. melo* var. *inodorus* (Honey dew melon), *C. melo* var. *flexuosus* (American cucumber or snake or serpent melon), *C. melo* var. *conomon* (Oriental pickling melon), *C. melo* var. *chito* (Mango melon), *C. melo* var. *dudaim* (Stink melon or Queen Anne's pocket melon) and *C. melo* var. *momordica* (Indian snapmelon).[20] The traditional circumscription of this variety included all wild populations in the paleotropics,[21] regardless of ovary pubescence type. While short-haired populations of ssp. *agrestis* can be acceptably labeled as var. *agrestis* and long-haired wild population labeled ssp. *melo*. Stepansky *et al.* 1999 and other research workers incorrectly treat all Old-World wild populations as var. *agrestis*, without regard for suitable subspecies designation.[20]

MORPHOLOGY

C. melo var. *agrestis* is a thin stemmed, monoecious plant, bearing fruits with very thin mesocarp and tiny seeds. It is an annual climber growing up to 1.5 m. Stem is covered with hairs. Leaves are rough, hairy and 3 to 5 lobed. Flowers are small, yellow in colour. Flowering season is July to November. It possesses variability in morphology with respect to size, shape and colour of leaves, fruit length, fruit width and fruit weight, thickness of rind, thickness of flesh, number of seeds per fruit and stripes on fruit. [Figure 1]

GROWTH AND PROPAGATION

Wild melons are widely cultivated in all over India with more prevalence in the hot and dry North-Western zones. Propagation is through seeds. When the seeds are near or on the soil surface, they germinate. Light is necessary requirement for germination.[22] When they buried deeper, their germination is inhibited. Temperature effects the seed germination and optimal range of temperature is required for germination.[23] Enzyme activities are regulated by temperature that enhance or retard the synthesis of hormones which influences the seed germination.[24]

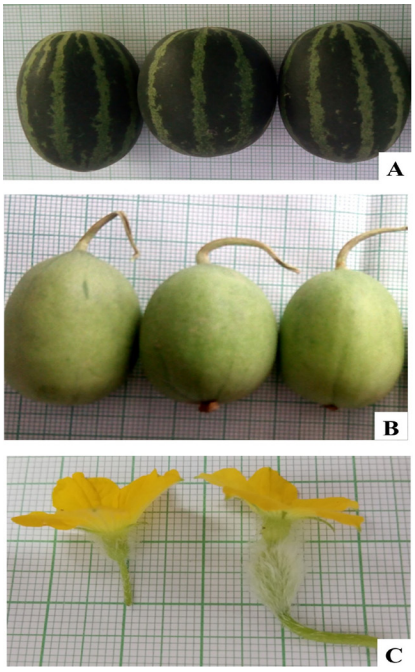

Figure 1: *Cucumis melo* var. *agrestis*, A-B: Fruit showing variation in morphology; C: Staminate and Pistilate flower.

Seed germination is also effected by some other environment factors such as osmotic potential and salinity stress of the soil.

NUTRITIONAL VALUE

In rural area, due to presence of adequate amount of all essential nutrients in *C. melo* var. *agrestis,* fruit is usually used as vegetable. Premature fruit contained carbohydrate (9.31%), protein (0.48%), lipid (0.29%), ash (0.93%) and moisture (88.99%), sodium (307.61 mg), potassium (218.88 mg), cobalt (1.025 mg) and iron (0.279 mg). Water soluble vitamins were (mg per 100 g of fruit) ascorbic acid (60), niacin (16.33), thiamine (12.60) and folic acid (10). In aqueous extract of premature fruit mannose, gulucose, serine, galactose, aspartic acid, alanine, phosphoserine, maltose, glutamic acid, threonine, glycine, valine, histidine, lysine, cystine, leucine isoleucine, phenylalanine, tyrosine, glutamine and asparagine were present. The fresh fruits are used in preparation of chutney.[25] Adekunle and Oluwo, 2008 reported that unripe fruit contained carbohydrate, lipids, proteins, amino acids (phenylalanine, glutamine and asparagine) and water soluble vitamins (ascorbic acid).[26]

ETHNOBOTANICAL IMPORTANCE

C. melo var. *agrestis* is a medicinally important plant. In tribal areas fruit is cut into pieces and dried, which is used as a condiment in cooking vegetables especially in carrot, which act as mild laxative[27] and also used as ingredient of pickle in Rajasthan. Fruits are used as for the purpose for moisturizing and cleaning the skin. It is used for treatment for abrasions and burns.[9] and possesses the stomachic properties.[10] Seeds possess antioxidant, antitussive, febrifuge and digestive and oil extracted from seeds have anti-fungal properties.[11]

PHYTOCHEMISTRY OF *C. MELO* VAR. *AGRESTIS*

Plant possesses many bioactive components, such as flavonoids, alkaloids, steroids, triterpenoids etc., which are secondary metabolites, possess healing activity and are used to cure several diseases.[28] Secondary metabolites are organic compounds that play an important

role in plant defense mechanism but are not directly involved in the growth and development of plant[29] So, it is very important to study the active component (phytochemical) in plants. Many researchers revealed various phytochemical constituents in *C. melo* var. *agrestis* extract has been enlisted in Table 2.

MEDICINAL VALUE (PHARMACOLOGICAL ACTIVITY)

Seeds of *C. melo* var. *agrestis* possess significant antioxidant, analgesic and anti-inflammatory properties.[31] Many plants derived substance phytonutrients and phytochemicals are known for their antioxidant activities. Antioxidant activity is owing to redox properties of constituents which act as reducing agents, singlet oxygen quencher and hydrogen donators.[35] Currently there is worldwide interest in identifying the antioxidant constituents which have little or no side effect and are pharmacological effective.[36] In varieties of medicinal plants, antioxidant is recognized as important beneficial component.[37] Free radical scavenging activity was measured by hydrogen peroxide and DPPH method.

ANTIOXIDANT ACTIVITIES

ANALGESIC ACTIVITY

Antioxidants and free radicals are responsible for pain stimulation and reduction.[39] Antioxidant activity of *Cucumis melo* var. *agrestis* are given in Table 3. The analgesic activity was evaluated by acetic acid-induced writhing response and tail immersion method in albino rats. The writhing test is usually applicable for antinociceptive effects.[40]

Table 2: Various phytochemical constituents of *C. melo* var. *agrestis*.

Author and year	Work done	Locality	Phytochemical constituents
Mariod and Matthaus, 2008	Fatty acid, tocopherol, sterol, phenolic profile of *C. melo* var. *agrestis*	Sudan	γ-tocopherol, α-tocopherol, β-sitosterol, catechin, vanillic acid. Total phenolic content was 31.9 - 33.0 mg/g of dry product. Total sterol content was 3,785 - 3,879 mg/Kg. γ-tocopherol 77.6% - 80.7%. α-tocopherol at 18% - 21%.[30]
Arora *et al*. 2011	Preliminary phytochemical screening of methanolic extract of *C. melo* var. *agrestis*.	Punjab	Alkaloids, tannins, flavonoids, carbohydrates, proteins, glycosides, steroids, triterpenoids and phenolic acids.[31]
Kaur *et al*. 2011	Curde extract of seeds of *C. melo* var. *agrestis* was subjected to preliminary phytochemical screening.	Punjab	Alkaloids, flavonoids, carbohydrates, proteins, glycosides, steroids, triterpenoids and phenolic acids.[11]
Devi *et al*. 2013	Methanol and aqueous extract of powdered seeds was screened for various phytoconstituents.	Rajasthan (Jodhpur)	Alkaloids, proteins, carbohydrates, flavonoids and sterols.[32]
Sahithi *et al*. 2015	Extract of plant were subjected to preliminary test	Nalgonda Distt. Telangana (South India)	Carbohydrates, saponin, tannins, flavonoids, steroids, triterpenoids, glycosides and alkaloids.[12]
Memon *et al*. 2017	The screening and analysis of phytoconstituents *C. melo* var *argestis* fruit.	District Tharparkar, Sindh Pakistan	Phenolic compounds, tannins, alkaloids, carbohydrates, proteins, steroids, triterpenoids and glycosides.[33]
Gopalasatheeskumar *et al*. 2019	Quantification of total phenolic and flavonoid content in leaves of *C. melo* var. *agrestis* using UV- spectrophotometer.	Tamil Nadu	Hydroalcholic leaf extract of *C. melo* var. *agrestis* showed the presence of alkaloids, tannins, flavonoids, carbohydrates, glycosides, saponins, proteins and amino acid. Total phenolic content was 77.82 mg/g and total flavonoid content was 30.06 mg/g.[34]

Table 3: Antioxidant activities of *C. melo* var. *agrestis* are enlisted in table given below.

Author and year	Activity studied	Locality	Results
Arora *et al*. 2011	Evaluation of antioxidant activity of methanolic seed extract of *C. melo* var. *agrestis*.	Punjab	Extract of seeds showed significant 69.86% at 400µg kg^{-1} scavenging activity by hydrogen peroxide method as compared to Ascorbic acid which was used as standard and 75.59% at 300µg mL^{-1} by DPPH method.[31]
Kaur *et al*. 2011	Antioxidant activity of *C. melo* var. *agrestis* seeds.	Punjab	The methanolic seed extract have significant scavenging activity. Ascorbic acid is used as standard. At concentration 300µg/mL methanolic extract of seeds was found to have maximum (75.59%) scavenging activity (DPPH method). The maximum H_2O_2 scavenging activity was found to be 69.86% at concentration of 400 µg/mL.[11]
Sahithi *et al*. 2015	Study of antioxidant activity of *C. melo* var. *agrestis* fruit.	Nalgonda Dist, Telangana (South India)	Fruit of *C. melo* var. *agrestis in vitro* possess antioxidant activity. It showed % scavenging activity ranging from 66-112%.[12]
Yasir *et al*. 2016	Antioxidant and genoprotective activity of selected cucurbitaceae seed extracts.	Faisalabad, Pakistan	Seeds of *C. melo* var. *agrestis* show 72.76 ± 1.4, 76.85 ± 1.6, 79.45 ± 1.0 %age radical scavenging activity in 70%, 50%, 30% methanolic extract respectively and shows 81.25 ± 1.2, 85.99 ± 0.5, 86.21 ± 0.9 %age scavenging activity in 2.0 M, 1.0 M, 0.5 M acidified methanolic extract.[38]

The acetic acid-induced writhing response was significantly suppressed by methanolic extract of *C. melo* var. *agrestis* (100, 200 and 300 mg kg-1) ($p<0.05$) at dose of 300 mg kg-1. Acetylsalicylic acid is used a standard drug which increases inhibition of writhing movements. Similarly, in tail immersion method, methanolic extract revealed dose dependent activity against conduction of heat induced analgesia in rats.[31]

ANTI-INFLAMMATORY ACTIVITY

Inflammation is caused by enhancing the activity of genes such as interluki-6 (IL-6) TNF-α, interferons etc. (responsible for production of proinflammatory cytokines).[41]

Anti-inflammatory activity was evaluated by carrageenan induced rat paw edema. *C. melo* var. *agrestis* extract repressed the edema in the early and in late phase of a severe inflammation with highest inhibitory effect exhibit at dose 300 mg kg-1. This showed that this extract has control the production of proinflammatory cytokines.[41]

ANTI-DYSLIPIDEMIC AND ANTI-ADIPOGENIC ACTIVITY

Dyslipidemia (lipoprotein metabolism disorder) occurs when someone has abnormal levels of lipids in their blood. While the term describes a wide range of conditions, the most common forms of dyslipidemia involve high levels of low-density lipoproteins (LDL), bad cholesterol, low levels of high-density lipoproteins (HDL), or good cholesterol, high levels of triglycerides and high cholesterol, which refers to high LDL and triglyceride levels.[42,43] It is a major aspect responsible for several cardiovascular diseases (CVDs). Flavonoids showed both anti-adipogenic and anti-dyslipidemic activity, but these activities are not similar to each other.[44] Anti-adipogenic compounds also show anti-dyslipidemic activities. In 3T3-L1 adipocytes, anti-adipogenic activity of CMFE (*C. melo* var. *agrestis* fruit extract) found to decrease the concentration-dependent oil-red-O accumulation (dye which stained lipids and neutral TGs). This revealed that fruit extract of *C. melo* var. *agrestis* (CMFE) is responsible for low accumulation of lipids during adipogenic differentiation of 3T3-L1. Treatment with CMWF (*C. melo* var. *agrestis* water fraction) and CMHF (*C. melo* var. *agrestis* hexane fraction) is attributed for lowering the level of TC, TG and LDL-c, which cure serum dyslipidemia.[43]

CONCLUSION

C. melo var. *agrestis* commonly known as wild melon or chibber has been used for its several properties. Large number of phytoconstituents has been revealed. However, not much work is done in pharmacological field, which have been carried out to show its valuable effects. Hence, this review will provide base for further studies.

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CONFLICT OF INTEREST

Authors declared that they have no conflict of interest regarding the publication of this research. The research did not involve any human participants and/or animals.

ABBREVIATIONS

DPPH: α, α-diphenyl-β-picrylhydrazyl; **TC:** Total Cholesterol; **TG:** Total triglyceride; **TNF-α:** Tumor Necrosis Factor alpha; **H_2O_2:** Hydrogen peroxide.

REFERENCES

1. Huie CW. A Review of Modern sample preparation techniques for the extraction and analysis of medicinal plants. Journal of Analytical and Bioanalytical Chemistry. 2002;373(1-2):23-30.
2. Ukwuani AN, Abubakar MG, Hassan SW, Agaie BM. Antinociceptive Activity of Hydromethanolic Extract of Some Medicinal Plants in Mice. International Journal of Pharmacy. 2013;104:120-5.
3. Briskin DP. Medicinal plants and phytomedicines: Linking plant Biochemistry and Physiology to human health. Journal of Plant Physiology. 2000;124(2):507-14.
4. Ruba AA, Nishanthini A, Mohan VR. *In vitro* Antioxidant and Free Radical Scavenging Activities of Leaf of *Arthocnemum* fruticosum Moq (Chenopodiaceae). The Journal of Free Radicals and Antioxidants. 2013;139:166-74.
5. Munger HM, Robinson RW. Nomenclature of *Cucumis melo* L. Cucurbit Genet Coop Rep. 1991;4:43-4.
6. Chakravarty HL. Monograph on Indian Cucurbitaceae-Taxonomy and Distribution-Pub. Bot Surv India. 1959;17(1).
7. Deakin JR, Bohn GW, Whitaker TW. Interspecific hybridization in *Cucumis*. Economic Botany. 1971;195-211.
8. Nayar NM, Singh R. Taxonomy, distribution and ethnobotanical uses in Cucurbits. Science Publishers, Inc., U.S.A. 1998;1-18.
9. Burkill HM. The useful Plants of West Tropical Africa. 2nd edn. Richmond, Surry, UK: Royal Botanic Gardens, Kew. 1985;1.
10. Shankar K, Singh SK, Kumar D, Varshney S, Gupta A, Rajan S, *et al. Cucumis melo* ssp. *agrestis* var. *agrestis* ameliorates high fat diet induced Dyslipidemia in Syrian golden hamsters and inhibits adipogenesis in 3T3-L1 adipocytes. Pharmacognosy Magazine. 2015;11(Suppl 4):S501-10.
11. Kaur M, Arora R. Antioxidant activity of *C. melo* var. *agrestis* seeds for their Therapeutic Potential. International Journal of Research in Ayurveda and Pharmacy. 2011;2(4):1235-8.
12. Sahithi G, Vasanthi R, Banji D, Rao KN, Selvakumar D. Study of phytochemical and antioxidant activity of *Cucumis melo* var. *agrestis* fruit. Journal of Pharmacognosy and Phytochemistry. 2015;4(2).
13. Allaby RG, Brown TA, Fuller DQ. A simulation of the effect of inbreeding on crop domestication genetics with comments on the integration of archaeobotany and genetics: A reply to Honne and Heun. Vegetation History and Archaeobotany. 2010;19(2):151-8.
14. Fuller DQ, Willcox G, Allaby RG. Early agricultural pathways: Moving outside the 'core area' hypothesis in Southwest Asia. J Exp Bot. 2011. doi:10.1093/jxb/err307.
15. Kirkbride JH. Biosystematic monograph of the genus *Cucumis* (Cucurbitaceae): Botanical identification of cucumbers and melons. Parkway Publishers, Inc. 1993.
16. Jeffrey C. Further notes on Cucurbitaceae. V: The Cucurbitaceae of the Indian subcontinent. Kew Bull. 1980;34:789-809.
17. Pitrat M, Hanelt P, Hammer K. Some comments on infraspecific classification of cultivars of melon. In VII Eucarpia Meeting on Cucurbit Genetics and Breeding 510. 2000; 29-36.
18. Naudin C. Essais d'une monographie des espèces et des variétés du genre *Cucumis*. Ann Sci Nat. 1859;11:5-87.
19. Hammer K, Hanelt P, Perrino P. Carosello and the taxonomy of *Cucumis melo* L. especially of its vegetable races. Die Kulturpflanze. 1986;34(2):249-59.
20. Stepansky A, Kovalski I, Perl-Treves R. Intraspecific classification of melons (*Cucumis melo* L.) in view of their phenotypic and molecular variation. Plant Systematics and Evolution. 1999;217(3-4):313-32.
21. Cogniaux A, Diels L, Engler A, Harms H, Stubbe H. Das Pflanzenreich: Regni vegetabilis conspectus. Cucurbitaceae, Cucurbitae, Cucumerinae. Engelmann. 1924;88:246.
22. Bewley JD, Black M. Seeds: Physiology of development and germination. New York: Plenum Press. 1994;445-13.
23. Oliveira MJ, Norsworthy JK. Pitted morningglory (*Ipomoea lacunosa*) germination and emergence as affected by environmental factors and seeding depth. Weed Science. 2006;54(5):910-6.
24. Baskin CC, Baskin JM. Seeds: Ecology, biogeography and, evolution of dormancy and germination. Elsevier. 1998.
25. Dahot MU, Mangrio SM, Khaskhely MH, Dewani VK. Nutrient composition of chibber fruit. Communications in Soil Science and Plant Analysis. 1999;30(1-2):75-82.
26. Adekunle AA, Oluwo OA. The nutritive value of *Cucumis melo* var. *agrestis* Scrad (Cucurbitaceae) seeds and oil in Nigeria. Am J Food Technol. 2008;3:141-6.

27. Qureshi R, Bhatti GR, Memon RA. Ethnomedicinal uses of herbs from northern part of Nara desert, Pakistan. Pak J Bot. 2010;42(2):839-51.
28. Chanda S, Dave R, Kaneria M. *In vitro* antioxidant property of some Indian medicinal plants. Research Journal of Medicinal Plants. 2011;5(2):169-79.
29. Harborne JB, Baxter H. Pyrrolizidine Alkaloids: Phytochemical Dictionary. Bristol. 1983;255-66.
30. Mariod A, Matthaeus B. Fatty acids, tocopherols, sterols, phenolic profiles and oxidative stability of *Cucumis melo* var. *agrestis* oil. Journal of Food Lipids. 2008;15(1):56-67.
31. Arora R, Kaur M, Gill NS. Antioxidant activity and pharmacological evaluation of *Cucumis melo* var. *agrestis* methanolic seed extract. Research Journal of Phytochemistry. 2011;5(3):146-55.
32. Devi K, Kumar H, Parashar B. Standardization and Preliminary Phytochemical Evaluation of *Cucumis melo* subsp. *agrestis* var. *agrestis* seeds. American Journal of Pharm Tech Research. 2013;3(2):304-10.
33. Memon M, Ghanghro A, Memon A, Usman G, Shah A, Abro A. Nutritional Profile and Medicinal Properties of *Cucumis melo* var *agrestis*: A Non-Conventional Vegetable. Sindh University Research Journal-SURJ. 2018;50(1):115-8.
34. Gopalasatheeskumar K, Kumar GA, Sengottuvel T, Devan VS, Srividhya V. Quantification of Total Phenolic and Flavonoid content in leaves of *Cucumis melo* var. *agrestis* using UV-spectrophotometer. Asian Journal of Research in Chemistry. 2019;12(6):335-7.
35. Anokwuru CP, Esiaba I, Ajibaye O, Adesuyi AO. Polyphenolic content and antioxidant activity of *Hibiscus sabdariffa* calyx. Research Journal of Medicinal Plant. 2011;5(5):557-66.
36. Premanath R, Sudisha J, Lakshmi Devi N, Aradhya SM. Antibacterial and antioxidant activities of fenugreek (*Trigonella foenum graecum* L.) leaves. Journal Medicinal Plants Resereach. 2011;5(6):695-705.
37. Pham-Huy LA, He H, Pham-Huy C. Free radicals, antioxidants in disease and health. International Journal of Biomedical Science. 2008;4(2):89-96.
38. Yasir M, Sultana B, Nigam PS, Owusu-Apenten R. Antioxidant and genoprotective activity of selected cucurbitaceae seed extracts and LC–ESIMS/MS identification of phenolic components. Food Chemistry. 2016;199:307-13.
39. Gill NS, Bajwa J, Dhiman K, Sharma P, Sood S, Sharma PD, *et al.* Evaluation of therapeutic potential of traditionally consumed Cucumis melo seeds. Asian Journal of Plant Sciences. 2011;10(1):86.
40. Reanmongkol W, Itharat A, Bouking P. Investigation of the anti-inflammatory, analgesic and antipyretic activities of the extracts from the rhizome of *Dioscorea membranacea* Pierre in experimental animals. The Songklanakarin Journal of Science and Technology. 2007;29(Suppl 1):49-57.
41. Parke DV, Sapota A. Chemical toxicity and reactive oxygen species. International Journal of Occupational Medicine and Environmental Health. 1996;9(4):331-40.
42. Marsh JB. Lipoprotein metabolism in obesity and diabetes: Insights from stable isotope kinetic studies in humans. Nutr Rev. 2003;61(11):363-75.
43. Mooradian AD. Dyslipidemia in type 2 diabetes mellitus. Nat Clin Pract Endocrinol Metab. 2009;5(3):150-9
44. Varshney S, Shankar K, Beg M, Balaramnavar VM, Mishra SK, Jagdale P, *et al.* Rohitukine inhibits *in vitro* adipogenesis arresting mitotic clonal expansion and improves dyslipidemia *in vivo*. J Lipid Res. 2014;55(6):1019-32.

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