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Pharmacognostic Studies on a Well Known Cardio Protective Plant *Pistacia Vera*

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ABSTRACT

The plant *Pistacia vera* (commonly called as Pista) has many significant studies in HDL and proves to be cardioprotective. It also has additional properties, which include antioxidant activity, anti-inflammatory activity and antimicrobial activity. Thus, further research would bring beneficial effects for cardiovascular diseases. In the present study the detailed pharmacognostic parameters are discussed viz., Physicochemical, TLC , Histlogical and microbial and which revealed the fingerprint profile of *Pistachio vera*

KEY WORDS: Pistacia vera, Physiocchemical, TLC Histological, Microbial limits

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Introduction:

The pistachio (*Pistacia vera* L., Anacardiaceae; sometimes placed in Pistaciaceae) is a small tree up to 10 m tall, high-value commercial crop native to mountainous regions of Iran, Turkmenistan and western Afghanistan. The kernels are eaten whole, either fresh or roasted and salted, and are also used in ice cream and confections such as baklava. The plants are dioecious, with separate male and female trees. The flowers are apetalous and unisexual, and borne in panicles. The pistachio fruit can be classified as a semidry drupe containing a single edible, elongated seed (kernel) (a nut in the culinary sense, but not a true botanical nut), encased by a thin soft, mauvish coat (testa), enclosed by a creamy , hard woody appearance, lignified shell (endocarp), which is surrounded by a green to yellow-red colored, depending on the degree of ripeness, fleshy hull.

Fruit of P. vera (pistachio) is used all over the world. Records of the consumption of pistachio as a food date to 7000 BC. Various parts of the plant have been used in different traditional system of medicines. Ethnomedicinal uses are; fruit kernel of *P. vera* have been used for a long time as useful remedies for different diseases, for example, the as a cardiac, stomach, sedative, hepatic, and brain tonic in traditional Iranian medicine (TIM). The oil is used as face skin cleanser. Seed, fruits are used for abdominal ailments, abscesses, amenorrhoea, bruises, chest ailments, circulation, dysentery, gynecopathy, pruritus, rheumatism, sclerosis of the liver, sores and trauma. Pistachio is an important source of energy and many nutrients, dietary fibers, magnesium, phosphorus, absorbable calcium and low sodium contents, antioxidants; including tocopherols, carotenes, lutein, selenium, and are the richest source of phytosterols, linoleic and linolenic acid, all these are essential for human health[1,2,3].

In a study conducted to investigate the polyphenols derived from pistachios for their acti-microbial activity against *E. coli, P.aeruginosa, P. mirabilis, L. monocytogenes, E. hirae, E. faecium, B. subtilis, S. epidermidis, S. aureus, C. albicans , C. parapsilosis and A.niger* showed better inhibition against *S. aureus* [4]. Which was proven again by [5].Pistachios showed good anti-oxidant activity owing this property to the presence of phenolic compounds [6, 7]. Various extracts of 5 metabolites from the fruit stems of *P. vera* were evaluated for their inhibitory effects against the α- glycosidase and α-amylase enzymes exerted good anti-diabetic potential [8].*Pistacia vera* red hull shown to possess cytotoxic effects against MCF-

7 cells thus suggesting as a treatment that may promote induced apoptosis when combined anticancer drug [9].

The plant has many significant therapeutic and traditional values in addition to their biologcal properties, which include antioxidant activity, anti-inflammatory activity and antimicrobial activity. Hence an attempt is made to standardize this plant pharmacognsotically.

MATERIALS AND METHODS

Voucher specimen: The plant material seeds of *Pistacia vera* was collected and Identity was confirmed with the voucher specimen using Gamble (1935). **Physico-chemical values** such as the percentage of total ash, acid-insoluble ash, and water and alcohol-soluble extractives were calculated as per the (The Ayurvedic Pharmacopoeia of India,2001). **TLC fingerprinting** profile carried as per (Stahl E 1965). For the **Anatomical studies,** transverse sections (TS) were prepared and stained (Wallis, 1957). A standard, **Limit for total microbial count** provided by WHO Guidelines(1998) was followed and also Indian herbal pharmacopoeia

RESULTS AND DISCUSSIONS

Oraganoleptic and Physicochemical Parameters:

Table1: Showing the Physicochemical and Organoleptic parameters

Physicochemical Constants	
Parametrs	**Values**
TA	3.3%
AIA	0.1%
ASE	44.4%
WSE	12.7%

Organoleptic Characters	
Parametrs	**Values**
Taste	Sweet
Color	Greenish
Odour	Pleasant
Texture	Smooth

TA – Total Ash; **AIA –** Acid Insoluble Ash; **ASE –** Alcohol Soluble Extractive; **WSE –** Water SolubleExtractive

The percentage of total ash, acid insoluble ash, water solubleash, bitterness, powder fineness and foreign matter were determined and presented in Table 1. Results of ash analysis indicated the purity of drug, while rest of the parameters gave adulteration or contamination possibility in the drug. The organoleptic properties are true to the plant.

TLC Finger Printing Profile:

Table 2: Rf Values of the Bands

Under Visible Light								
Rf Values	0.09	-	-	-	-	-	-	-
Sprayed with 10% H_2SO_4								
Rf Values	0.04	0.36	0.43	0.57	0.94	-	-	-
Sprayed with Anisaldehyde								
Rf Values	0.05	0.33	0.39	0.6	0.92	-	-	-
Under Short UV (254 nm)								
Rf Values	-	-	-	-	-	-	-	-
Under Long UV (366 nm)								
Rf Values	-	-	-	-	-	-	-	-

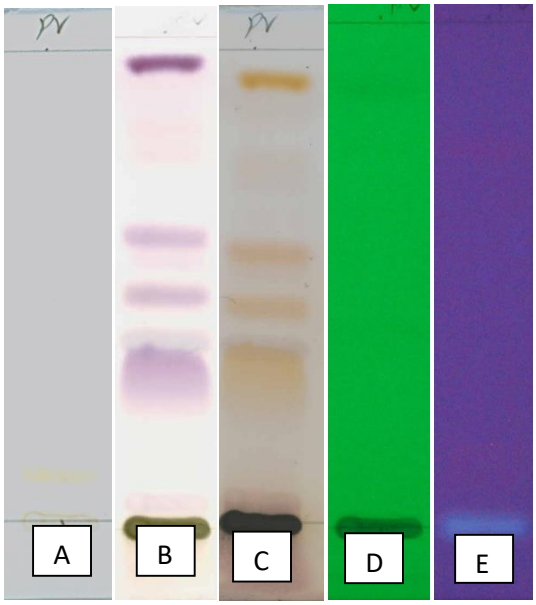

Fig 1:Plates observed

A-Under Visible Light **B-**Sprayed with 10% H_2SO_4 **C-**Sprayed with Anisaldehyde **D-**Under Short UV (254 nm) **E-** Under Long UV (366 nm)

The TLC profile showed only one yellow band in visible light and five bands each when sprayed with H_2SO_4 and Anisaldehyde. No bands are seen in UV lights at 254 and 366nm respectively (Table2, Fig 1)

Anatomical Characters:

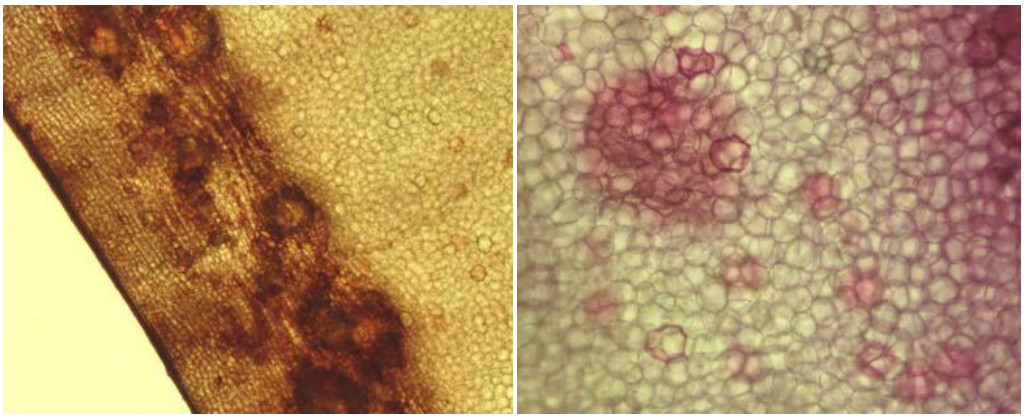

Fig 2: showing TS of seed

1. T.S of nut shows epicarp, mesocarp and endocarp. 2. Epidarp consists of layers of cells, which forms the epidermis, which are polygonal in shape, 3. Mesocarp filed with tubular cells and also palisade like structures 4. Endocarp consists of polygonal parenchyma cells filled with abundant starch grains , aleuron grains and oil globules (Fig 2).

Powder Characters:

Powder Colour: Green:

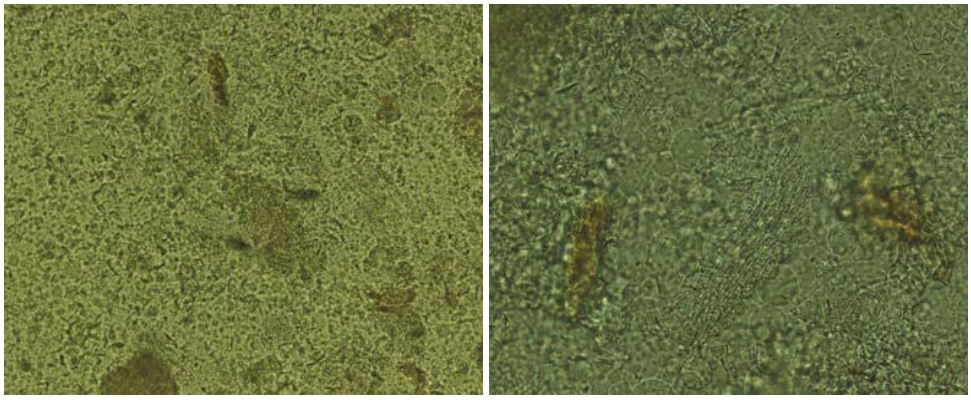

Fig3: Showing Powder microscopy

1. Number of epidermal cells and polygonal parenchyma cells, 2. Aleruron grains are abundant, 3. Main content of the powder is oil globules (Fig 3).

Microbial Limit Test

Total Aerobic Bacterial Count (TABC): 2.8 x 10^3
Total Yeast and Mould Count (TYMC): 0.8 x 10^3
(Microbial contamination limit for raw herbs – TABC: $<10^7$, TYMC: $<10^5$)

Both the Bacterias and yesat and Mould count tests indicated that the results are well with in prescribed results of WHO 1998.

CONCLUSIONS

The Pharmacognostic study establishes fingerprint profile of *Pistacia vera* a well know edible cardio protective nut. The studies parameters are first of its kind on this plant. The authenticity and purity is established by physicochemical studies. Whereas TLC profile indicated unique pattern by showing 5 bands each when sprayed with almost same Rf vales. The Oil globules are characteristic feature in seed anatomy and the microbial limit tests indicated that the microbial load is well with in the prescribed load of Bacteria and Fungi

REFERENCES

I. GHASEMINASAB, P. M., Ahmadi, A., & MAZLOOMI, S. M. (2015). A review on pistachio: Its composition and benefits regarding the prevention or treatment of diseases.

II. Bozorgi, M., Memariani, Z., Mobli, M., Salehi Surmaghi, M. H., Shams-Ardekani, M. R., & Rahimi, R. (2013). Five Pistacia species (P. vera, P. atlantica, P. terebinthus, P. khinjuk, and P. lentiscus): a review of their traditional uses, phytochemistry, and pharmacology. *The Scientific World Journal*, *2013*.

III. Rauf, A., Patel, S., Uddin, G., Siddiqui, B. S., Ahmad, B., Muhammad, N., ... & Hadda, T. B. (2017). Phytochemical, ethnomedicinal uses and pharmacological profile of genus Pistacia. *Biomedicine & Pharmacotherapy*, *86*, 393-404.

IV. Bisignano, C., Filocamo, A., Faulks, R. M., & Mandalari, G. (2013). In vitro antimicrobial activity of pistachio (Pistacia vera L.) polyphenols. *FEMS microbiology letters*, *341*(1), 62-67.

V. La Camera, E., Bisignano, C., Crisafi, G., Smeriglio, A., Denaro, M., Trombetta, D., & Mandalari, G. (2018). Biochemical Characterization of Clinical Strains of Staphylococcus spp. and Their Sensitivity to Polyphenols-Rich Extracts from Pistachio (Pistacia vera L.). *Pathogens*, *7*(4), 82.

VI. Sonmezdag, A. S., Kelebek, H., & Selli, S. (2017). Characterization and comparative evaluation of volatile, phenolic and antioxidant properties of pistachio (Pistacia vera L.) hull. *Journal of essential oil research*, *29*(3), 262-270.

VII. Taghizadeh, S. F., Davarynejad, G., Asili, J., Nemati, S. H., & Karimi, G. (2018). Assessment of phenolic profile and antioxidant power of five pistachio (Pistacia vera) cultivars collected from four geographical regions of Iran. *Avicenna journal of phytomedicine*, *8*(1), 33.

VIII. Lawali, Y. D., Mehmet, A., Tuba, A., & Ahmet, C. (2020). Antidiabetic and Anticholinesterase Properties of Extracts and Pure Metabolites of Fruit Stems of Pistachio (Pistacia vera L.). *Current Organic Chemistry*, *24*(7), 785-797.

IX. Seifaddinipour, M., Farghadani, R., Namvar, F., Bin Mohamad, J., & Muhamad, N. A. (2020). In Vitro and In Vivo Anticancer Activity of the Most Cytotoxic Fraction of Pistachio Hull Extract in Breast Cancer. *Molecules*, *25*(8), 1776.

X. Gamble J. S. Flora of The Presidency of Madras. Newmann and Adlard London West, 1935, Vol II

XI. The Ayurvedic Pharmacopoeia of India, Vol;1-4, Ministry of Health and Family welfare, Govt. of India, 2001.

XII. Stahl E Thin layer chromatography, Springer International Student Edition New York,(1965).

XIII. Wallis T. E. Text Book of Pharmacognosy, Fifth Edition, CBS Publication and Distributors, 1957, pp: 389-396.

XIV. WHO. Quality Control methods for Medicinal Plant materials, WHO, Geneva, 1998, pp: 22