International Journal of Pharmacology and Pharmaceutical Research
www.pharmacologyjournals.com
Online ISSN: 2664-7192; Print ISSN: 2664-7184; Impact Factor: RJIF 5.42
Received: 28-11-2020; Accepted: 11-12-2020; Published: 26-12-2020
Volume 2; Issue 1; 2020; Page No. 19-21

Pharmacognstic evaluations of *Persea americana* mill

Vijay Danapur[1*], Ashwini A[1], Haleshi C[2]
[1] Vriksha Vijnan Private Limited, Chikkallasandra, Bangalore, Karnataka, India
[2] Department of Botany, Davangere University, Davangere, Karnataka, India

DOI: https://doi.org/10.33545/26647184.2020.v2.i1a.10

Abstract
The ripe *Persea Americana* or avocado fruits consists of the hard peel, the pulp with a butter-like consistency and a peculiar nutty flavour, and the seed. The fruit is eaten as salad flavoured with pepper, salt or sugar. It is also used in soups and ice-cream. Avocado oil obtained by pressing the dried pulp, has a heavy consistency, a week odour and a taste reminiscent of hazelnuts. It commands high price and is valued for use in cosmetic preparations and as a high grade salad oil. It is also used in superior quality soaps and in pharmaceuticals. The meal left after the extraction of oil from the pulp is also used as an animal feed or as manure. In the present study the parameters viz., physicochemical, Organoleptic, TLC and Microbial limit tests are studied to standardise this plant by pharmacognosy.

Keywords: *Persea americana*, avocado, TLC, physicochemical, anatomical, microbial limits

Introduction
Persea americana; avocado is a tropical tree native to Central and South America, eastern Mexico. Avocado fruit is highly nutritious being rich in fat and containing appreciable amounts of protein, minerals and vitamins and many other classes of bioactive compounds with antioxidant properties. Predominantly, it has been propagated for food and medicinal purposes due to its high nutritional content and health benefits. The pulp has an exceptionally high content of fatty oil (66-84% on dry basis), which resembles other fruit coat fats in composition. The plant is used in traditional medicine for the treatment of various ailments, such as ulcers, hypertension, bronchitis, stomach ache, cardiovascular diseases, hypoglycemic, diabete, s diarrhea and monorrhagia. Active molecules in the avocado have been shown to have potential health benefits including; Analgesic and antiinflammatory, Hypotensive, Anticonvulsant, Antiviral, Wound healing, Antihepatotoxic activities etc. The tree has a straight trunk with a spreading crown and will bear fruit 4 to 8 years after planting. The leathery leaves are elliptical to lanceolate and strongly veined. Young branches terete, glabrate, often with conspicuous leaf scars. Leaves dark green on upper surface, lower surface pale green, alternate, variable in shape and size, but usually elliptic, 10-25 cm long, 5-10 cm wide, margins entire. Flowers in pubescent inflorescences shorter than leaves, clustered at the tips of the branches or on short, lateral young branches; tepals equal, 5 mm long, densely pubescent; fertile stamens 9, staminodia present; anthers tetrathecal; The fruit is a large fleshy pear shaped drupe with a green skin, very rich in vitamins, proteins and fats (7 to 23 %) with little sugar. There are many varieties and the skin colour and texture varies from variety to variety. The seed is large and has 2 halves [1].

In a study conducted to evaluate the anti-oxidant activity of seed, pulp and skin of avocado by *in vitro* DPPH• assay, seed exhibited better activity (43%), followed by skin (35%) and the fruit pulp (23%) [2]. In a research to demonstrate protective effect of active components present in avocado leaves against neomycin-induced hair cell damage; juglanin and (+)-lyoniresinol showed substantial cell regeneration [3]. When anti-diabetic activity of methanolic extract of leaves of avocado were examined against α -glucosidase, β -glucosidase, maltase-glucoamylase, aldose reductase and aldehyde reductase, avocado emerged as a potent compound to treat diabetes [4]. Extracts of avocado were tested against *Klebsiella pneumonia*, *Staphylococcus epidermidis*, *Candida albicans* and *Candida tropicalis* [5]; *Bacillus cereus*, *Bacillus subtilis*, *Pseudomonas aeruginosa*, *Salmonella typhi*, *Staphylococcus aureus*, *Shigella flexneri*, *Escherichia coli* [6] illustrated good inhibition and emerged as a promising anti-microbial agent. In view of the medicinal significance of the aforementioned plant, a detailed pharmacognostic analysis was carried out to further authenticate and classify the plant, setting pharmacopoeial standards for the plant.

Materials and Methods
Voucher specimen: The plant materials were collected and Identity was confirmed with the voucher specimen using [7]. Physico-chemical values such as the percentage of total ash, acid-insoluble ash, and water and alcohol-soluble extractives were calculated as per the Ayurvedic Pharmacopeia of India, [8]. TLC fingerprinting profile carried as per [9]. For the Anatomical studies transverse sections (TS) and Powder microscopy studies were prepared and stained [10, 11]. A standard guideline for total microbial Limit count was provided by WHO [12].

Results and Discussions

Table 1: Pharmacognosy features

Physicochemical Constants			Organoleptic Characters	
Parametrs	Values	Limit	Parametrs	Values
TA	4.8%	NA	Taste	Sweetish
AIA	0.5%	NA	Color	Greenish
ASE	10.3%	NA	Odour	Mild
WSE	33.4%	NA	Texture	Fibrous

TA - Total Ash; **AIA** - Acid Insoluble Ash; **ASE** - Alcohol Soluble Extractive; **WSE** - Water Soluble Extractive; **NA**-Not available

Physicochemical parameters guide us to authentic plant material and impurity investigations including salts, silica or cross contamination of raw materials. Organoleptic properties are distinct (table 1)

Table2: TLC Profile

TLC Finger Printing Profile								
Under Visible Light								
Rf Values	-	-	-	-	-	-	-	-
Sprayed with 10% H2SO4								
Rf Values	0.03	0.06	0.19	0.31	0.43	0.63	0.95	-
Sprayed with Anisaldehyde								
Rf Values	0.04	0.07	0.23	0.36	0.51	0.58	0.69	0.97
Under Short UV (254 nm)								
Rf Values	-	-	-	-	-	-	-	-
Under Long UV (366 nm)								
Rf Values	0.14	-	-	-	-	-	-	-

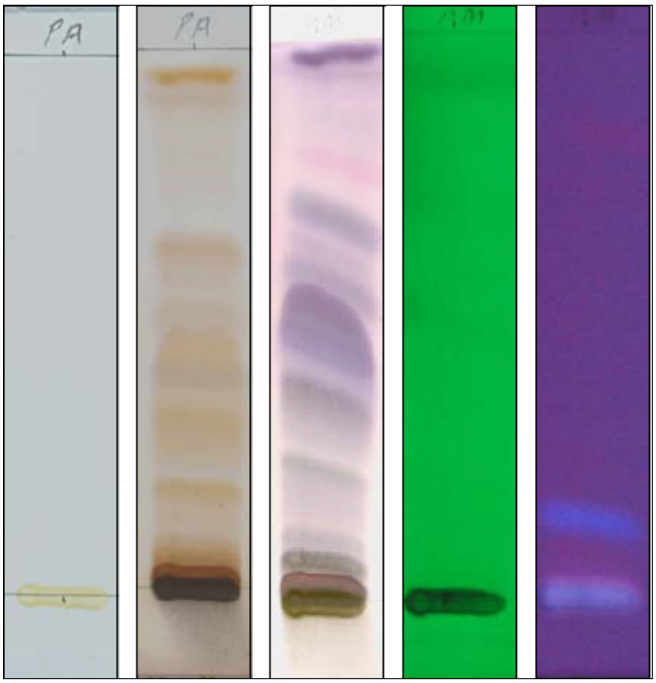

Table 2: TLC Profile

Persea americana showed no band under visible light, 7 bands when sprayed with 10% H2SO4 and 8 bands when sprayed with Anisaldehyde. Further 0, 1 band was observed under short and long UV light respectively. The results are qualitative TLC finger print profile of plant under study (table 2, fig 1)

Anatomical Characters

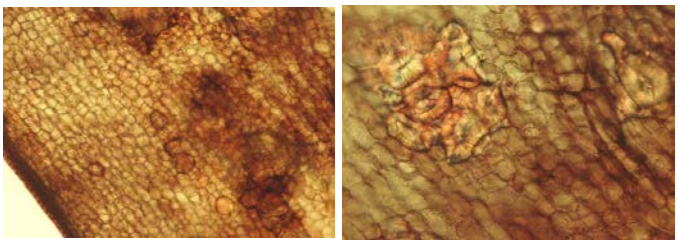

Fig 2: Anatomical Characters of *Persea americana*

Thick outer layered is present which is to called epidermis, 7-8 layers of thick cortical cells composed which are in sclrenchymatous, these cells composed of deposition of oil glands, After cortical cells up to center parenchymatous cells are present may be 20-25 layers, In these cells calcium oxalate crystals that are in star shaped, oil globules are in golden yellow in colour round to oval (fig 2).

Powder Characters: Powder colour: Brown

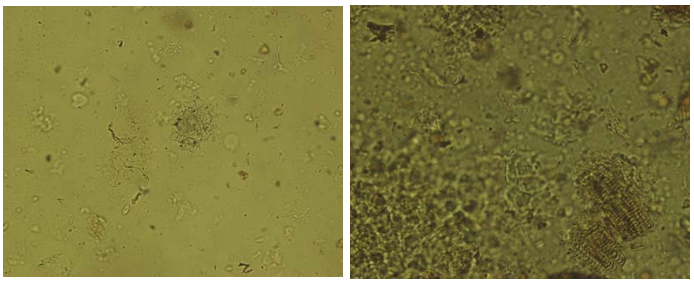

Fig 3: Powder characteristics of *Persea americana*

1. Many numbers of parenchymatous cells with fibers and tracheids,
2. Starch grins are in groups, abundant oil globules,
3. Oil droplets are distributed in all the cells.

Powder microscopy enables the acquisition of knowledge about the various broken parts of the sample that are particular and play a crucial role in the recognition of the raw sample (fig 3).

Microbial Limit Test

Total Aerobic Bacterial Count (TABC): 1.4 x 103
Total Yeast and Mould Count (TYMC): 1 x 103
(Microbial contamination limit for raw herbs - TABC: <107, TYMC: <105)
All measures were within the limits laid down in the WHO and Indian Herbal Pharmacopeia Guidelines.

Conclusion

Authentication and identification of therapeutically significant plant by various pharmacognostic approach including; macroscopic, microscopic guidelines and physico-chemical parameters are crucial requirements. Taking that into consideration, the present study intended at standardization on *Persea americana* which can serve as a reliable tool. Physcio chemical factors will help to authenticate the sample of the plant. The TLC profile will act as a fingerprint profile for the plant. Organoleptic, anatomical and powder microscopic assessments are plant-specific. The microbial limit of the raw material was in accordance with the standards laid down.

References

1. Yasir M, Das S, Kharya MD. The phytochemical and pharmacological profile of Persea Americana Mill. Pharmacognosy reviews. 2010; 4(7):77.
2. Vinha AF, Moreira J, Barreira SV. Physicochemical parameters, phytochemical composition and antioxidant activity of the algarvian avocado (Persea Americana Mill.). Journal of Agricultural Science. 2013; 5(12):100.

3. Park S, Nam YH, Rodriguez I, Park JH, Kwak HJ, Oh Y *et al*. Chemical constituents of leaves of Persea americana (avocado) and their protective effects against neomycin-induced hair cell damage. Revista Brasileira de Farmacognosia. 2019; 29(6):739-743.
4. Njateng GSS, Zaib S, Chimi LY, Feudjio C, Mouokeu RS, Gatsing D *et al*. Antidiabetic potential of methanol extracts from leaves of Piper umbellatum L. and Persea americana Mill. Asian Pacific Journal of Tropical Biomedicine. 2018; 8(3):160.
5. Makopa M, Mangiza B, Banda B, Mozirandi W, Mombeshora M, Mukanganyama S. Antibacterial, Antifungal, and Antidiabetic Effects of Leaf Extracts from Persea americana Mill.(Lauraceae). Biochemistry Research International, 2020.
6. Ajayi OE, Awala SI, Olalekan OT, Alabi OA. Evaluation of Antimicrobial Potency and Phytochemical Screening of Persea americana Leaf Extracts against Selected Bacterial and Fungal Isolates of Clinical Importance. Microbiology Research Journal International, 2017, 1-11.
7. Gamble JS. Flora of the Presidency of Madras. Newmann and Adlard London West, 1935, 1-3.
8. The Ayurvedic Pharmacopoeia of India, Ministry of Health and Family welfare, Govt. of India, 2001, 1-4.
9. Stahl E Thin layer chromatography, Springer International Student Edition New York, 1965.
10. Wallis T. E. Text Book of Pharmacognosy, Fifth Edition, CBS Publication and Distributors, 1957, 389-396.
11. Johansen DA. Plant Microtechnique. McGraw-Hill, New York, 1940, 523.
12. WHO. Quality Control methods for Medicinal Plant materials, WHO, Geneva, 1998, 22.