



Evaluation of Physico-chemical And chromatographic profile of Kababchini Fruit (*Pipercubeba*)

Dipshikha S. Rakhunde*¹ Deepak K. Sharma² Surekha T. Landge³

1. P G Scholar
2. Guide
3. H.O.D

Dravyaguna Department, Shri Ayurved, Hanuman Nagar, Nagpur, Maharashtra

*Corresponding Author: rsdipshikha13@gmail.com

ABSTRACT:

Indian spices that provide flavor, color, and aroma to food also possess many therapeutic properties. Ancient Indian texts of Ayurveda, an Indian system of medicine, detailed the medicinal properties of these plants and their therapeutic usage. Natural products have traditionally provided many of the drugs in use. Kababchini is a spice commonly used in Asian countries for cooking purposes. It is the dried fruit of an evergreen small tree, *Pimentadiaoica* which belongs to the family of creepers. The pimenta is a parasitic plant and grows on other full-grown trees. The kababchini's plant is about nine meters in height and its leaves are egg-shaped and 10–12 cm in length. Its fruit is tiny and green in color. It keeps the digestive tract normal and is very effective in case of piles. It strengthens heart. It helps in treating cough and asthmatic conditions. It regularizes the menstrual cycle. It is very effective in erectile dysfunction. It is very effective in toning up of the urinary tract. With the increasing interests in the reservoir of untested natural products, many future drug developments will be based on natural products. The standard profile of kababchini is not given in API, so that's why the present article reviews the Ayurvedic aspects of Kababchini well supported by the available literature and its physico-chemical and Chromatographic profile.

KEYWORD: Physico-chemicals, Chromatographic profile, Kababchini

INTRODUCTION:

Most of the crude drugs (Plant materials) are usually put in quarantine store and they remain there for long time. During storage proper ventilation, humidity controls and light conditions should be ensured to maintain their original pharmacological action. Crude plant materials, before being taken for processing, are not analyzed which can lead to changes in original characteristics. To avoid all this, the crude drugs should be tested. The Study includes Foreign organic matter, Total ash contents, Acid insoluble ash, Water soluble extractives, alcohol soluble extractives, HPTLC.



Fig 1 Kababchini fruit

Fig 2 Kababchini fruit powder

BOTANICAL CLASSIFICATION

Kingdom :-Plantae
Division :-Magnoliophyta
Class :-Magnolipsida
Order :-Piperales
Family:-Piperaceae
Genus :-Piper
Species :-cubeba

The kababchini fruit is used to obtain many useful chemicals like volatile oil, nitrogenous matter including pinene, camphene, cadalene and sesquiterpenes.

SYNONYMS:-

Sanskrit name :-Kankol

English name :-Cubeb / Tailed pepper

Hindi name :-Kababchini

HABITAT:-It is found in Indonesia and Malaysia. In India it is found in Mysore.

MORPHOLOGY:-It is a creeper that creeps on that climbs on the trees. Leaves are 5 to 7 inch in length and are heart shaped. Flowers are present in bunches and are small. These are monoecious. Fruits are round and are very similar to that of black pepper. It has a diameter of 6 to 8 mm in diameter.

CHEMICAL CONSTITUENTS:-It has bluish green aromatic oil which is 5 to 20 %, it has a resin 6 to 8.5 %, gum, coloring substance and starch. Resins contain cubebin, cubebol and cubebic acid

PHARMACOLOGY:-It is a vata and kapha suppressant. It is a good stimulant of the body organs due to presence of astringent and bitter taste. It normalizes the digestive tract due to presence of light properties. It improves circulation due to astringent taste. It also cleans up the respiratory tract and expels about the extra

mucus present in the tract. It is also a good aphrodisiac agent and relieves from menstrual disturbances. It also acts as diuretic agent.

MEDICINAL USES:- Kababchini's uses and benefits are countless. It is considered to be a very useful herb. Some medicinal uses of this marvelous spice are as follows:

- It is used in medicines that are used for curing mouth diseases.
- It is used in the preparation of aromatic oils that are used to treat arthritis and relieve joint pain.
- It is used as a stimulant.
- It has the ability to solve diuretic and expectorant problems.
- It is used in the treatment of dysentery, asthma, and leucorrhoea.
- It is widely used as a home remedy for throat infections and also by singers to maintain a clear throat.
- It helps to relieve a sore throat, cough, and rheumatism.

Sample 1:

1. Weight of sample taken(W1)-100 g.
2. Weight after sorting of sample(W2)-99.20 g
3. Weight of foreign matter(W3)-0.80 g

Therefore, calculations are-

$$\frac{W1-W2}{W1} \times 100 = \frac{100-99.20}{100} \times 100$$

$$=0.80\% \text{ w/w in 100 g}$$

Sample 2:

1. Weight of sample taken(W1)-100 g.
2. Weight after sorting of sample(W2)-99.25 g
3. Weight of foreign matter(W3)-0.80 g

Therefore, calculations are-

$$\frac{W1-W2}{W1} \times 100 = \frac{100-99.25}{100} \times 100$$

$$=0.75\% \text{ w/w in 100 g}$$

Sample 3:

- It is used to treat flatulence and dyspepsia.

PHYSICO-CHEMICAL ANALYSIS OF KABABCHINI FRUIT

A) Description of Kababchini:

❖ Colour	:-Black
❖ Odour; :-	Aromatic
❖ Taste:	:-Bitter
❖ Texture:	:-Rough
❖ Fracture:	:-Sound present on fracture

B) Foreign matter:- The sample shall be free from visible signs of contamination, i.e. moulds, insects and other animal contamination, including animal excreta, fungus and dust. However, no poisonous, dangerous or otherwise harmful foreign matter or residue should be allowed.

1. Weight of sample taken(W1)-100 g.
2. Weight after sorting of sample(W2)-99.15 g
3. Weight of foreign matter(W3)-0.80 g

Therefore, calculations are-

$$\frac{W1-W2}{W1} \times 100 = \frac{100-99.15}{100} \times 100$$

$$= 0.85\% \text{ w/w in 100 g}$$

Sr. No.	Sample	Foreign matter
1.	Sample 1	0.80% w/w in 100 g
2.	Sample 2	0.75% w/w in 100 g
3.	Sample 3	0.85% w/w in 100 g

C)Total Ash Value:-The total ash was obtained by taking Accurately weighed 2 g of the dried plant material was taken in a tarred Silica dish and was ignited with a flame of Bunsen burner for about one hour. The ignition was completed by keeping it in a muffle furnace at $550^{\circ}\text{C} \pm 20^{\circ}\text{C}$ till grey ash was formed. It was then cooled in desiccators and weighed.

Sample 1:

1. Weight of empty crucible (W1) -35.5550 g.
2. Weight of crucible with sample (W2)-36.5612 g.
3. After heating (W3) -35.6510g.

$$\text{Total ash value} = \frac{W3-W1}{W2-W1} \times 100$$

$$= 9.54\%$$

Sample 2:

1. Weight of empty crucible (W1) -36.5478 g.
2. Weight of crucible with sample (W2)-37.5512 g.
3. After heating (W3) -36.6450g.

$$\text{Total ash value} = \frac{W3-W1}{W2-W1} \times 100$$

$$= 9.68\%$$

Sample 3:

1. Weight of empty crucible (W1) -33.3428 g.
2. Weight of crucible with sample (W2)-34.5520 g.
3. After heating (W3) -33.6510g.

$$\text{Total ash value} = \frac{W3-W1}{W2-W1} \times 100$$

$$= 10.72\%$$

Sr. No.	Sample	Total Ash Value
1.	Sample 1	9.54%
2.	Sample 2	9.68%
3.	Sample 3	10.72%

D) Acid Insoluble Ash :-The total ash was moistened with 25 ml dilute HCl and evaporated to dryness after which it was kept in an electric air oven maintained at $135^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 3 hr. It was then allowed to cool, and was filtered through Whatmann filter paper No. 41. The residue was then washed with hot water. The filter paper and the residue were put in a dish and ignited in a muffle furnace at $550^{\circ}\text{C} \pm 20^{\circ}\text{C}$ for one hour. The process of cooling in a desiccators and weighing was done and found to be less than one mg.

Sample 1:

Initial weight (W1) = 42.4010

After drying weight (W2) = 42.4330

$W2 - W1 = 0.032$

$W2 - W1 \times 10$

Water soluble extractive value = $\frac{\text{W2-W1} \times 10}{\text{Wt of sample}} \times 100$

Wt of sample

= 12.80%

Sample 2:

Initial weight (W1) = 45.5220

After drying weight (W2) = 45.5560

$W2 - W1 = 0.034$

$W2 - W1 \times 10$

Water soluble extractive value = $\frac{\text{W2-W1} \times 10}{\text{Wt of sample}} \times 100$

Wt of sample

= 13.6%

Sample 3:

Initial weight (W1) = 47.2280

After drying weight (W2) = 47.2558

$W2 - W1 = 0.0278$

$W2 - W1 \times 10$

Water soluble extractive value = $\frac{\text{W2-W1} \times 10}{\text{Wt of sample}} \times 100$

Wt of sample

= 11.12%

Sr. No.	Sample	Acid Insoluble Ash
1.	Sample 1	7.04%
2.	Sample 2	7.03%
3.	Sample 3	7.05%

E) Water soluble extractives:-Accurately weighed 2.5 g of kababchini powder was placed in glass-stoppered conical flask. To it 50 ml of water was added. The flask was shaken frequently for six hours, and then allowed to stand for eighteen hours. The contents were filtered rapidly to avoid loss of solvent. The filtrate was transferred to a previously weighed clean beaker and evaporated to dryness on a water-bath. After evaporation the extract was dried at 105°C for six hours and kept in a desiccator for cooling. The beaker was weighed and percent extractable matter in water was calculated.

Sr. No.	Sample	Water soluble extractives
1.	Sample 1	12.80%
2.	Sample 2	13.6%
3.	Sample 3	11.12%

F) Alcohol soluble extractives:-

Accurately weighed 1.25 g of kababchini powder material was placed in glass-stoppered conical flask. To it 25 ml 90% ethanol was added. The flask was shaken

frequently for six hours, and then allowed to stand for eighteen hours. The contents were filtered rapidly to avoid loss of solvent. The filtrate was transferred to a previously weighed clean beaker and evaporated to dryness on a water-bath. After evaporation the extract was dried at 105°C for six hours and kept in a desiccator for cooling. The beaker was weighed and percent extractable matter in water was calculated.

Sample 1:

Initial weight (W1) = 42.8400

After drying weight (W2) = 42.8670

W2-W1 = 0.0549

$\frac{W2-W1 \times 10}{Wt \text{ of sample}}$

Alcohol soluble extractive value = $\frac{W2-W1 \times 10}{Wt \text{ of sample}} \times 100$
= 28.80%

Sample 2:

Initial weight (W1) = 44.7034

After drying weight (W2) = 44.7330

W2-W1 = 0.0549

$\frac{W2-W1 \times 10}{Wt \text{ of sample}}$

Alcohol soluble extractive value = $\frac{W2-W1 \times 10}{Wt \text{ of sample}} \times 100$
= 23.68%

Sample 3:

Initial weight (W1) = 43.7034

After drying weight (W2) = 43.7327

W2-W1 = 0.0549

$\frac{W2-W1 \times 10}{Wt \text{ of sample}}$

Alcohol soluble extractive value = $\frac{W2-W1 \times 10}{Wt \text{ of sample}} \times 100$
= 25.84%

Sr. No.	Sample	Alcohol soluble extractives
1.	Sample 1	28.80%
2.	Sample 2	23.68%
3.	Sample 3	25.84%

Qualitative analysis

G) Finger printing type of High performance thin layer chromatography

Stationary phase

Plate size (X x Y) :- 5.0 x 10.0 cm

Material :- HPTLC plates

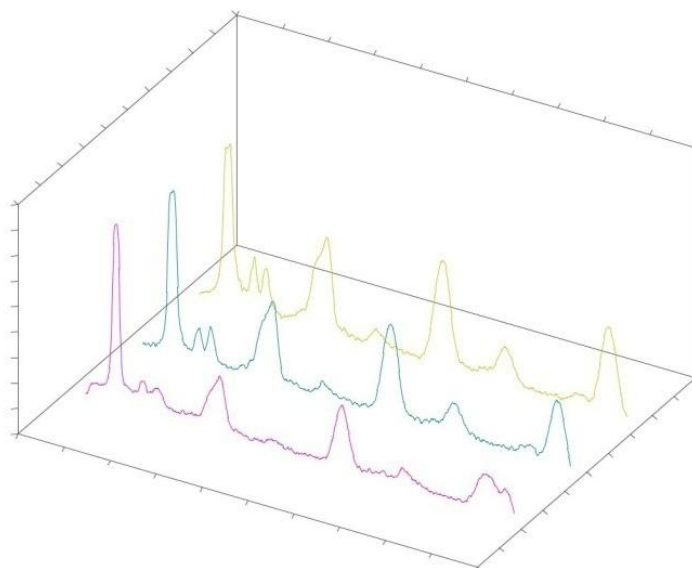
silica gel 60 F 254

Chamber type :- Twin Trough Chamber
20x10cm

Mobile phase :- Toulene:Ethyl
acetate- 70:30
Volume :-10 ml

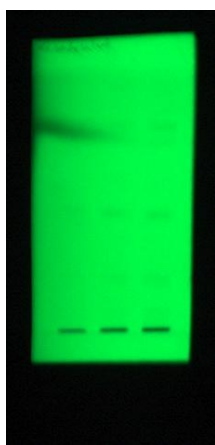
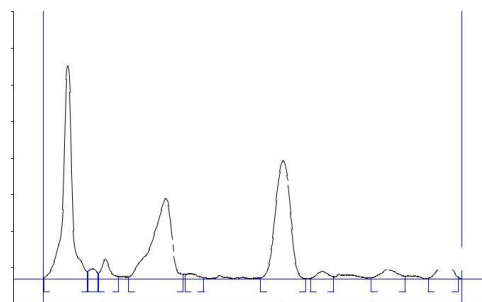
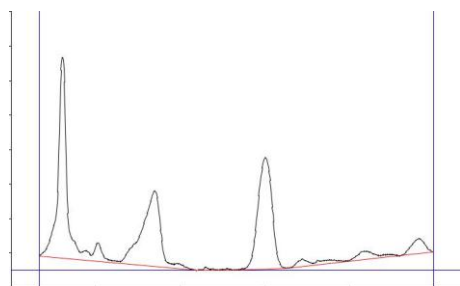
Temperature :- 60 °C
Time :-5 mins

All tracks at Wavelength

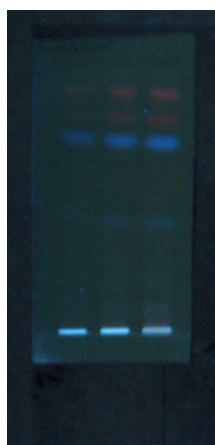


	Sta rt	Star t	Ma x	Max	Max	En d	End		Are a	
Pea k	Rf	Heig ht	Rf	Heig ht	%	Rf	Heig ht	Are a	%	Assigned substance
1	0.03	21.3	0.0 5	27.4	2.09	0.0 6	15.8	427.0	1.34	AutoGenerate d5
2	0.06	16.0	0.0 7	53.6	4.09	0.1 0	6.9	877.3	2.75	AutoGenerate d4
3	0.12	5.5	0.2 1	219. 6	16.7 6	0.2 5	12.0	8145. 8	25.5 4	AutoGenerate d3
4	0.25	12.1	0.2 6	14.6	1.12	0.2 9	2.5	321.1	1.01	AutoGenerate d11
5	0.42	2.3	0.4 7	323. 2	24.6 7	0.5 2	0.2	9291. 5	29.1 4	AutoGenerate d2
6	0.53	1.4	0.5 6	21.3	1.63	0.5 8	5.0	474.1	1.49	AutoGenerate d7
7	0.67	1.6	0.7 0	25.0	1.91	0.7 4	6.7	840.2	2.63	AutoGenerate d9
8	0.79	1.2	0.8 3	43.2	3.30	0.8 6	5.5	1189. 2	3.73	AutoGenerate d6

KABABCHINI (Piper cubeba)



254 nm

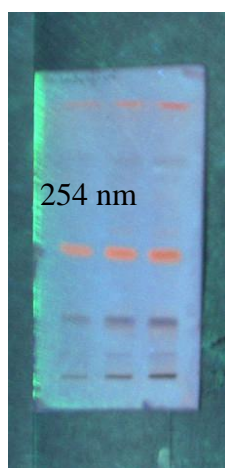


366 nm

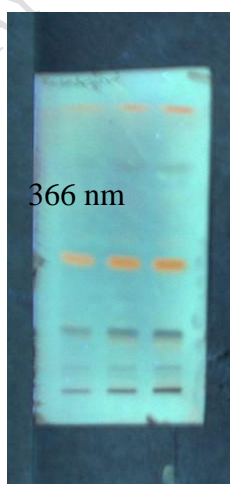


White R

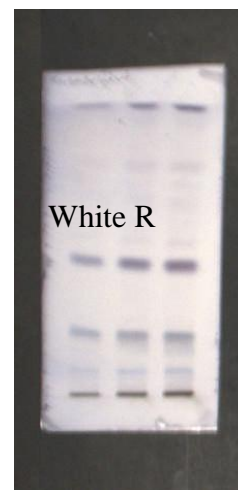
Kababchini fingerprinting visible



254 nm



366 nm



White R

Kababchini fingerprinting after derivatisation

Discussion:-The standardization of kababchini is done by the above method. The all values of the Foreign organic

matter, Total ash contents, Acid insoluble ash, Water soluble extractives, Alcohol soluble extractives are as per given in the

above table. HPTLC is done by the above described method. The results are found as given in table.

Conclusion:- From the above study we can understand the difference between the insoluble ash ranges from 0.0388 g to 0.0384 . The values of Alcohol soluble extractives ranges from 0.0495 g to 0.0501. The values of Water soluble extractives ranges from 0.0549 g to 0.0498. From all the above study it is concluded that the standardization is important before drug taken for the further process. From this result, we conclude the standard value for the standard drug in future and it will help in formation of standard combination of medicine.

standard drug and adulteration. By taken three samples, the value of foreign matter ranges from 0.80% w/w to 0.85% w/w in 100 g. The values of total ash ranges from 0.9613 g to 0.9656 g. The values of Acid

References:

- 1) Dravyaguna Vidyana vol 2, Aacharya P. V. Sharma, 2006, Chowkhambha Bharti Publications.
- 2) Ayurvedic Pharmacopoeia of India Part 1 Vol 1, 1999, Ministry of Health and Family Planning, Govt. of India, new Delhi.

Cite this article:

Evaluation of Physico-chemical And chromatographic profile of Kababchini Fruit (*Pipercubeba*)

Dipshikha S. Rakhunde, Deepak K. Sharma, Surekha T. Landge

Ayurlog: National Journal of Research in Ayurved Science-2017; 6(1): 1-9