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Pharmacognostic Investigations on the Seeds of Butea Monosperma (Lam.) Taub

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Abstract: *Butea monosperma is commonly known as Flame of forest, belonging to the family Fabaceae. It is locally called as palas, palash, mutthuga, bijasneha, dhak, khakara, chichra, Bastard Teak, Bengal Kino, Nourouc and is common throughout India, Burma and Ceylon except in very acrid parts.All parts of the plant are traditionally used for curing various diseases and disorders. The plant is traditionally reported to possess astringent, bitter, alterative, aphrodiasiac, anthelmintic, antibacterial and anti-asthmatic properties. The Seeds have anthelmintic property especially for roundworms and tapeworms. Hence, the objectives of the present work were pharmacognostic, physicochemical and phytochemical studies of Butea monosperma un-ripe and ripe seeds. Macroscopic, microscopic and powder features, phytochemical, physicochemical properties and were determined using standard methods.The Seed flat, kidney-shaped, 2.5 to 4 cm long, 1 to 3 cm wide, seeds coat raddish brown thin waxy, hilum was of simple and oblong, margin was smooth, unripe seed was creamiest whiteshgreen in colour while ripe seed was dark brown in colour. The seed; odour, faint; taste, slightly acrid and bitter. The seed is characterized by finely ridged seed coat and palisade like malpighian cells, discontinuous transparent linealucida in upper half of malpighian layers. The microscopic study showed seed was divided into four parts epicarp, mesocarp, testa and endocarp. The epicarp was single layered with thin smooth cuticle layer, polygonal parenchymatous cells. Endocarp consisted of sclerenchyma cells with oil globules; The plasmodesma was yellowish in colour with radially elongated thick walled mucilaginous cells.Palasonin and nitrogenous acidic compounds is present in seeds. Seed also contains isomonospermoside, monospermoside and allophanic acid. The parameters evaluated in physicochemical analysis were all within limits. All the extractive values of un-ripe seed were more than that of ripe seed. The crude powder of un-ripe seeds showed presence of alkaloids, phenols and glycoside while ripe seed showed presence of alkaloids. Butea monosperma seeds contain fixed oil, mixed fatty acids, and unsaponifiable matter. The parameters evaluated in this study are the diagnostic features of the unripe and ripe seeds.*

Keywords: *Butea monosperma*.

I. INTRODUCTION

Butea monosperma commonly known as flame of the forest or the flame tree belongs to the subfamily "Caesalpinioideae," of family Fabaceae or Leguminosae. It grows all over India. Various parts of this plant such as flower, bark, leaf, and seed gum are used in traditional medicine. Butea monosperma belongs to family Fabaceae is native to tropical and subtropical parts of Indian subcontinent and south East Asia ranging across India, Bangladesh, Nepal, Shrilanka, Thailand, Malaysia and Western Indonesia. Seed have long been used in traditional medicine as anthelmintics, in inflammation, skin and eye diseases, bleeding piles, urinary stones, abdominal troubles, ulcer protective, diuretics, intestinal worms and tumor. When seeds are pounded with lemon juice and applied to the skin, they act as a rubefacient and when made in pastes are used as a remedy for ringworm. The power shows fragments of testa, bearer cells, numerous simple ovals to round starch grains with concentric striations and a centric hilum, and also compound starch grains having 2 to 4 components, measuring 8 to 16 µ in diameter. The whole plant is rich in an array of pharmacologically active secondary metabolites. All parts of `palasha are therapeutically used.[1] The seeds have long been used in traditional medicines as anthelminitic,suppose to be hot, dry , digestive, aperients, useful discharges, piles, skin disease, tumours ,abdominal troubles and have the diseases, tumours, abdominal troubles and have the

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property of reducing 'Kapha' and 'Vata'. It is also useful for herps, dermatitis, opthalmy, epilepsy, arthritis, and diabetes and useful in flatulence and constipation.The finely powdered form of seed are basically used for the children to treat there intestinal worms.. Seeds are well mixed in the milk or water and on a regular basis about 4tsp is taken to treat from the urinal problems and also to prevent and eliminate the stones in adult. The seeds are digestible,when thoroughly mix with lemon-honey mix and then taken it works as the powerful digestable. Externally seeds used with lemon juice and applied to skin, act as rubefacient and when made in
pasteare used as a remedy for ringworm and herps.[2]The powdered seeds are effective against hymenolepiasis, delirium and also possess insecticidal property. The seeds also creditable for curing obesity and used as an antifertility agent. The Seeds of B. monosperma is used in inflammation, skin and eye diseases, bleeding piles, urinary stones, abdominal troubles,, intestinal worms and tumour. When seeds are pounded with lemon juice and applied to the skin, they act as a rubefacient[3]. It is clear that Butea monosperma is very important and useful plant. It becomes necessary to lay down quality control parameters and standardization is very necessary to prevent it from adulteration and help in maintaining its therapeutic efficacy. Once the seed is dried and converted to powder, paste as drug form, it loses its morphological identity and is easily prone to adulteration and substitution. Adulteration and substitution is directly proportional to the efficacy of the plant. To the advanced technology, pharmacognostic studies still hold upright position since they are simple, easy and economic. Pharmacognostic studies involve organoleptic, macroscopic, and microscopic, powder studies, physicochemical studies, phytochemical studies etc [4].This tree has long been known to the Hindus under the Sanskrit name of palasha, as possessing precious therapeutic properties. Almost all the parts of Butea monosperma are being used since decades in medicine and for other purposes. It is considered as a good source of gum, resin, food, fibre, dye and traditionally being use for the treatment of number of diseases such as cancer, diabetes diarrhea and dysentery. [5] The plant is widely distributed in the country and called by various local names viz., Bastard Teak, Parrot Tree (Eng.), Chichra tesu, desukajhad, dhak, palas, chalcha, kankrei (Hindi), Palashpapra (Urdu),Muthuga (Can.), Palas, Polashi (Beng.), Porasum, Parasu (Tam.),Muriku, Shamata (Mal.), Modugu (Tel.), Khakda (Guj.), Kela (Sinh.).It is a useful plant in many ways. Its leaves are essential for various religious rituals in Hindu homes. These are also used as cheap leafplates and cups for rural feasts. In some parts of the country these are used for wrapping tobacco to make biddies. The various parts of Butea monosperma shows in fig.1[6]

Butea Monosperma :

Synonym:

Bastard tree,palash,flame-of-the-forest

Family:

Fabaceae or Leguminosae

Biological source:

Palash consists of dried seed, fruit, leaves and flowers of Butea monosperma Lam. (B. frondosa Koenig).

Botanical Classification (The Ayurvedic Pharmacopoeia)

- Kingdom: Plantae
- Class: Magnoliopsida
- Order: Fabales
- Family: Fabaceae
- Genus: Butea
- Division: Magnoliophyta
- Species: Monosperma (Lam.) Taubert

Common Names According to Kirtikar and Basu (1935) all the common names of this plant are listed.

- Sanskrit: Palasah
- Hindi: Dhak, Palas, Chalcha
- English: Bastard Teak,
- Parrot Tree Bengali: Palas,

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- Polashi Marathi: Kakracha
- Gujarati: Khakharo
- Tamil: Parasa

Fig.1: Various parts of butea monosperma

Fig. A: Flower (anticancer) Fig. B: Seed (anthelminthic) Fig. C: Root (Fig. D: Leaves (ant filarial) Fig. E: Pods Fig. F: Bark (antidiarrhoeal)

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II. LITERATURE REVIEW

RagunathanMuthuswamy,2014 Oct-Dec;*Butea frondosa* Roxb. and Koen. syn. *Butea monosperma* Lam. (Leguminosae or *Fabaceae*) is a tree grows up to the height of 8 m at the age 50 years. Its flowers are being used in traditional medicine for the treatment of ulcer, inflammation, hepatic disorder, and eye diseases.

A Gunakkunru [1], K Padmanaban, P Thirumal2005 Apr 26The anti-diarrhoeal potential of the ethanolic extract of stem bark of Butea monosperma (Lam) Kuntz has been evaluated using several experimental models in Wistar albino rats. The extract inhibited castor oil induced diarrhoea and PGE(2) induced enteropooling in rats; it also reduced gastrointestinal motility after charcoal meal administration. The results obtained establish the efficacy and substantiate the use of this herbal remedy as a non-specific treatment for diarrhoea in folk medicine.

Prashant Tiwari, March 07, 2019 Butea monosperma (BM) is a well-known medicinal plant which is a moderate sized deciduous tree and widely distributed in India, Ceylon and Burma. It has been used in traditional medicine practice from ancient time. It is also known as flame of forest commonly known as Palash or Dhak. Palash is described in Charaka Samhita, Susruta Samhita, Upanisads, Vedas, AstangaSangraha and AstangaHridaya. BM belonging to the family Leguminosae has a wide range of active principles like coreopsin, isocoreopsin, sulphurein, butein, butin, isobutrin, monospermoside and isomonospermoside, aurones, chalcones, flavonoids (palasitrin, prunetin) and steroids.

Savan Donga, : 28-08-2019 Carica papaya L. belongs to the family Caricaceae and is commonly known as papaya. All parts of the plant are traditionally used for curing various diseases and disorders. It is a tropical fruit well known for its flavor and nutritional properties. Unripe and ripe fruit of papaya is edible but the seeds are thrown away. Instead, they can be therapeutically used. Natural drugs are prone to adulteration and substitution; to prevent it, it is always essential to lay down quality control and standardization parameters.

Hence, the objectives of the present work were pharmacognostic, physicochemical and phytochemical studies of Carica papaya L. un-ripe and ripe seeds. Macroscopic, microscopic and powder features, phytochemical, physicochemical properties and fluorescence characteristics were determined using standard methods. The seeds were of clavate shape, hilum was of wavy type, margin was smooth, unripe seed was creamiest white in colour while ripe seed was dark black in colour. The microscopic study showed seed was divided into four parts epicarp, mesocarp, testa and endocarp. The epicarp was single layered with thin smooth cuticle layer, polygonal parenchymatous cells. Endocarp consisted of sclerenchyma cells with oil globules, The plasmodesma was yellowish in colour with radially elongated thick walled mucilaginous cells. The endocarp consisted of pitted aleuronic grains, oil globules, crystals of calcium oxalate and dicotyle structure.

II. MATERIAL AND METHODS

Plant collection: -

The un-ripe and ripe seeds of Butea monosperma were collected from kavathemahankal, sangli, India. The un-ripe and ripe seeds were separated. The samples collected were dried at 40-50 degree Celsius .The transverse section were made for microscopically details and pharmacognostical evaluation of various contents present in seed. Fresh samples were used for anatomical studies and dried parts were powdered, sieved and stored in an airtight container for further use.

Seed:

The chemical constituent palasonin and butein present in seed are reasponsible for their anthelmintic and contraceptives activities. also includes seed-derived alpha amyrin, beta sitosterol, its glucoside, and sucrose isolate. Palasonin, an antihelmintic principle, is found in it. Plasmatic, Stearic, Oleic, and Linoleic acids are found in its seeds .Palasonin and nitrogenous acidic compounds is present in seeds. [7] Seed also contains monospermoside (butein 3-e-D-glucoside) andallophanic acid. Flavone glycoside present in the seeds of BM which pos- sess potential antiviral activity BM seeds contain fixed oil, mixed fatty acids, and unsaponifiable matter.

Pharmacognostic study:-

a. Macroscopic, microscopic and powder microscopy study

The seeds of Butea monosperma were subjected to macroscopic studies .The parameters evaluated were the arrangement, size, shape, base, margin, apex, colour, odour, taste. For microscopic evaluation of seeds, thin transverse

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sections were made.The powder microscopy of dried powder of seeds was studied using standard procedures.The characteristic features observed were recorded by taking their photographs.

b. Physicochemical analysis

The physicochemical parameters like loss on drying, total ash, acid-insoluble ash, water-soluble ash, sulphated ash, nitrated ash and carbonated ash and extractive values in solvents of different polarity were determined in both un-ripe and ripe seeds of butea monosperma as per WHO guidelines. [8]

c. Physicochemical Definitions of Various Terms

Ash value:

The residue remaining after ignition is called ash content of the drug.

Formula:

Ash value can be determined by any of the three following methods:

Types of ASH VALUE

- Total ash value.
- Water soluble ash value.
- Acid insoluble ash value.
- Sulphated ash value
- Moisture content

1. **Total ash value:** It is method used to measure the total amount of material remaining after ignition.

2. Water soluble ash: Water soluble ash is the difference in weight between total ash and residue after treatment of total ash with water.

3. Acid insoluble ash: Acid insoluble ash is the residue obtained after boiling the total ash with dil.HCL and igniting the remaining insoluble matter.

4. Sulphated ash value: The sulfated ash value is to measure the amount of residual substance not ignited from a sample when the sample is ignited in the presence of sulfuric acid.

5. Moisture content: Moisture content is defined as quantity of water that exists in the soil mass. It can represent either the naturally present or water which is manually added. The term moisture content is otherwise known as water content.[9]

Determination of ash value for ripe seed:

1. Determination of Total ash value:

Procedure:

Take a silica crucible and keep in muffle furnace for 15 min After that keep it in the desiccators for 15 to 20 min then weight the empty silica crucible then add 2gm of drug powder into silica crucible . Ignite the sample gently until completely carbonized, keep it from burning, then gradually increase the temperature to 500-600°C. Continue the ignition until a constant weight of carbon-free ash is obtained. Calculate the percentage of total ash in the weight of CMM sample.[10]

Calculation:-

Weight of empty silica crucible = 29.01 gm

Weight of powdered crude drug = 2gm

Weight of silica crucible with ash = 29.50 gm

Weight of ash = weight of silica crucible with ash – weight of empty silica = 29.50 – 29.01 = 0.49gm

Ash value for 100 gm of crude drug = 0.49/2×100 = 24.5 %

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2. Acid-insoluble ash:

Procedure:-

Using 25 ml of dilute HCI wash the ash from the dish used for total ash into a 100 ml beaker.

Place a mere guaze over a Bunsen burner and boil for five minutes. Filter through an 'ashless' filter paper, wash the residue twice with hot water. Ignite a crucible in the flame, cool and weigh.

Put the filter-paper and residue together into the crucible, heat gently until vapours cease to be evolved and then more strongly until all carbon has been removed. Cool in desiccator. Weigh the residue and calculate acid-insoluble ash of the crude drug with reference to the air-dried sample of the crude drug.[11]

Calculation:

Weight of silica crusible (Wc)= 29.01 gm

Weight of sample drug (Ws)= 2gm

Weight of silica crusible +total Ash weight (Wf)= 29.28

Acid insoluble ash = Wf – Wc ÷ Ws×100 =29.28-29.01÷2×100 =13.5%

3. Determination of moisture content:

Procedure

Firstly Weight the empty silica crusible then add 1.5 g of powdered drug slowly. Then take the weight of silica crusible with powdered drug .keep the crusible in hot air oven for 15 min at 105^0c after that crusible transfer into desicator for 15 to 20 min and finally measure the weight of the crusible.[12]

Calculation:-

Weight of empty dish = 57.27 gm

Weight of empty dish +weight of drug = 58.77 gm

Weight of empty dish + weight of drug after drying = 58.72 gm

Moisture content = 58.77 – 58.72 = 0.05 gm

For 1.5 gm of drug content = 0.05 gm

Therefore, 100 gm of crude drug contain = 0.05 ÷1.5 × 100

Moisture content = 3.33%

4. Determination of sulphated ash:

Procedure:-

First weight the empty silica crusible then add 2gm of drug powder and weight it.Then add 3 to 4 drops of conc.H2SO4 then keep it in incinator and slowly increase the temperature. It becomes a red hot and converts into ash. Then it remove from the incinator and keep aside for few min then keep it into the desiccator for 20 min.and measure the weight of crusible sulphated ash.[13]

Calculation:-

Weight of crusible(W1)= 30.55gm

Weight of crusible +weight of crude drug (W2)=32.55gm

Weight of crude drug (W2-W1)= 2g

Weight of crusible +sulphated ash(W3) =31.20gm

Sulphated ash = W3-W1= 31.20-30.55 =0.65gm

5. Determination of Water soluble ash:

Procedure: Using 25 ml of water, wash the ash from the dish used for total ash into a 100 ml beaker. Place a mere guaze over a Bunsen burner and boil for five minutes. Filter through an 'ashless' filter paper; wash the residue twice with hot water. Ignite a crucible in the flame, cool and weigh.Put the filter-paper and residue together into the crucible, heat gently until vapours cease to be evolved and then more strongly until all carbon has been removed. Cool in

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desiccators. Weigh the residue and calculate acid-insoluble ash of the crude drug with referenceto the air-dried sample of the crude drug.[14]

Calculation:-
Weight of silica crusible (Wc)= 29.15 gm
Weight of sample drug (Ws)= 2gm
Weight of silica crusible +total Ash weight (Wf)= 29.55gm
Acid insoluble ash = Wf – Wc ÷ Ws×100 =29.55-29.15÷2×100 =20%

Determination of ash value for Un-ripe seed :
1. Determination of Total ash value:-
Calculation:-
Weight of empty silica crucible = 28.25gm
Weight of powdered crude drug = 2gm
Weight of silica crucible with ash = 28.40 gm
Weight of ash = weight of silica crucible with ash – weight of empty silica = 28.40-28.25 = 0.15gm
Ash value for 100 gm of crude drug = 0.15/2×100 = 7.5 %

2. Acid-insoluble ash
Calculation:-
Weight of sample drug (Ws) = 2g
Weight of silica crusible (Wc) =28.25gm
Weight of silica crusible +total Ash weight (Wf)= 28.66gm
Acid insoluble ash = Wf – Wc ÷ Ws×100 = 28.66-28.25÷ 2 ×100 =20.5%

3. Determination of moisture content:-
Calculation:-
Weight of empty dish = 28.85gm
Weight of empty dish +weight of drug = 30.85 gm
Weight of empty dish + weight of drug after drying = 29.77 gm
Moisture content = 30.85 - 29.77 = 1.08gm
For 1.5 gm of drug content =1.08gm
Therefore, 100 gm of crude drug content = 1.08 ÷1.5 × 100
Moisture content =72%

4. Determination of sulphated ash:
Calculation:-
Weight of crusible(W1)= 30.55gm
Weight of crusible +weight of crude drug (W2)= 32.55gm
Weight of crude drug (W2-W1)= 2gm
Weight of crusible +sulphated ash (W3) = 31gm
Sulphated ash = W3-W1= 31.00-30.55 =0.55gm

5. Determination of Water soluble ash:
Weight of sample drug (Ws) = 2g
Weight of silica crusible (Wc) =30.55gm
Weight of silica crusible +total Ash weight (Wf)= 30.85gm
Acid insoluble ash = Wf – Wc ÷ Ws×100 = 30.85-30.55÷ 2 ×100 = 15%

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Qualitative phytochemical Analysis:

The percentage of total ash, acid insoluble ash,alcohol and water soluble extractives, tannins, proteins, sugar and starch were determined.

Qualitative analysis for the detection of phytoconstituents in un-ripe and ripe seeds powder was carried out following the procedure.

Fixed oil were detected by using Saponification test.

Saponification test :Sample + 0.5N Alcoholic Potassium Hydroxide + Drop of Phenolpthalein, heat on water bath for 1-2 hour.

Observation : The formation of soap or partial neutrilization of alkali indicates the presence of fixed and fats.

Sample + Copper sulphate solution(1%) + 10% NaOH solution

Observtion : clear blue solution

Sample + Pinch of sodium hydrogen sulphate

Observation: Pungent odour [15]

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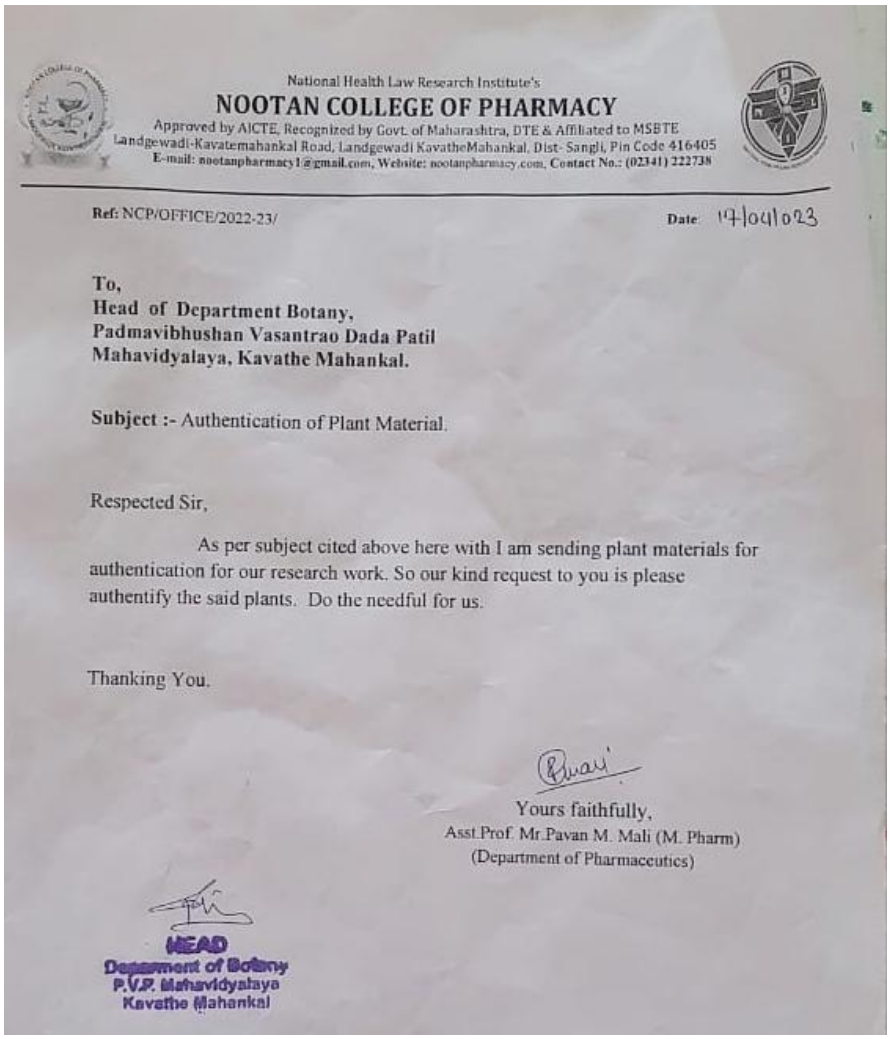

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To,
Head of Department Botany,
Padmavibhushan Vasantrao Dada Patil
Mahavidyalaya, Kavathe Mahankal.

Subject :- Authentication of Plant Material.

Respected Sir,

As per subject cited above here with I am sending plant materials for authentication for our research work. So our kind request to you is please authentify the said plants. Do the needful for us.

Thanking You.

Yours faithfully,
Asst.Prof. Mr.Pavan M. Mali (M. Pharm)
(Department of Pharmaceutics)

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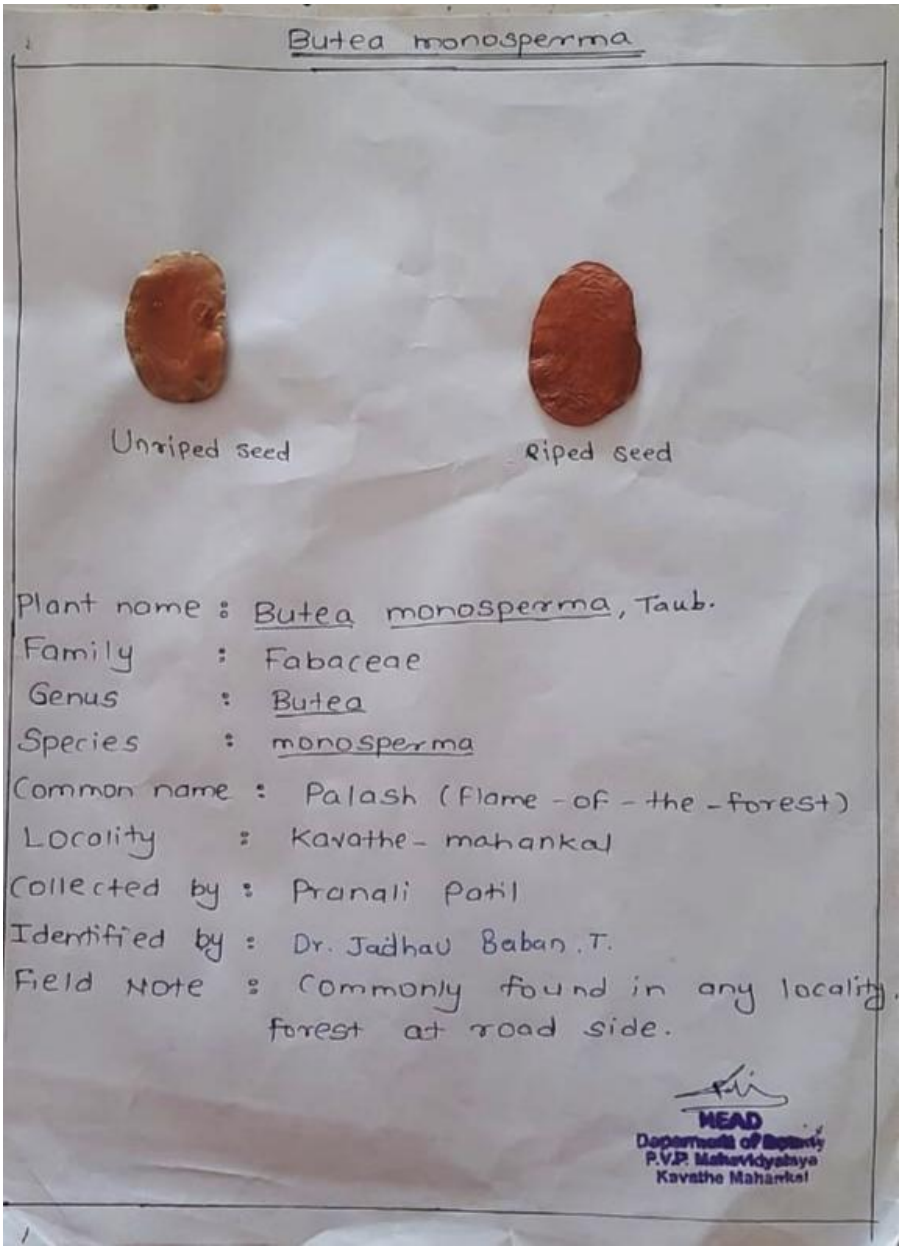

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III. RESULTS

a. Organoleptic and macroscopic characteristics:

Organoleptic and macroscopic characteristics of Butea monosperma un-ripe and ripe seeds is given in Table 1 and Fig. 2. The macroscopic study showed that un-ripe and ripe seeds were of kidney shaped. The size of un-ripe seed size was 3.5 cm long and 1.9 cm wide while that of ripe seed was 3.2 cm long and 0.9 cm wide. The hilum was of simple and oblong, margin was smooth, unripe seed was creamiest whitesh green in colour while ripe seed was dark brown in colour. The odour of seed is faint; taste is slightly acrid and bitter. The seed is characterized by finely ridged seed coat and palisade like malpighian cells, discontinuous transparent linealucida in upper half of malpighian layers.

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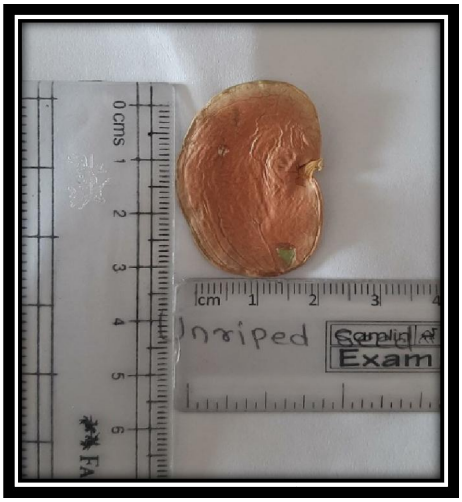

Fig.2 Un-ripe seed

Fig.3 Ripe Seed

Table 1 : Organoleptic features of Butea Monosperma unripe and ripe seed

Parts	Observation	
	Un-ripe	Ripe
Part	Seed	Seed
Hilum	Simple & oblong	Simple & oblong
Size	3.5 cm long and 1.9 cm wide	3.2 cm long and 0.9 cm wide
Shape	Kidney	Kidney
Color	Creamiest whitesh green	Reddish brown
Odour	Faint	Faint
Taste	Slightly acrid and bitter	Bitter

b. Microscopic characteristics:

The transverse section of Butea monosperma ripe seed is shown in Fig. The T.S of seed was divided into four parts epicarp, mesocarp, testa and endocarp. The epicarp was singe layered and was surrounded by thin smooth cuticle layer. The epicarp cells were polygonal parenchymatous type; testa was 3-4 layered, thick walled with cellulosic parenchymatous cells. Endocarp consisted of sclerenchyma cells with oil globules. The plasmodesma was yellowish in colour, and consisted of radially elongated thick walled mucilaginous cells. The upper surface of endocarp was single layered, consisted of polygonal shapeparenchymatous tissue. The endocarp was thick walled with cellulosic sclrenchymatous cells, consisted of pitted aleuronic grain cells, oil globules and dicotylestructure. Several square crystals of calcium oxalate were present in endocarpic cell. All the characters were same in un-ripe seed.

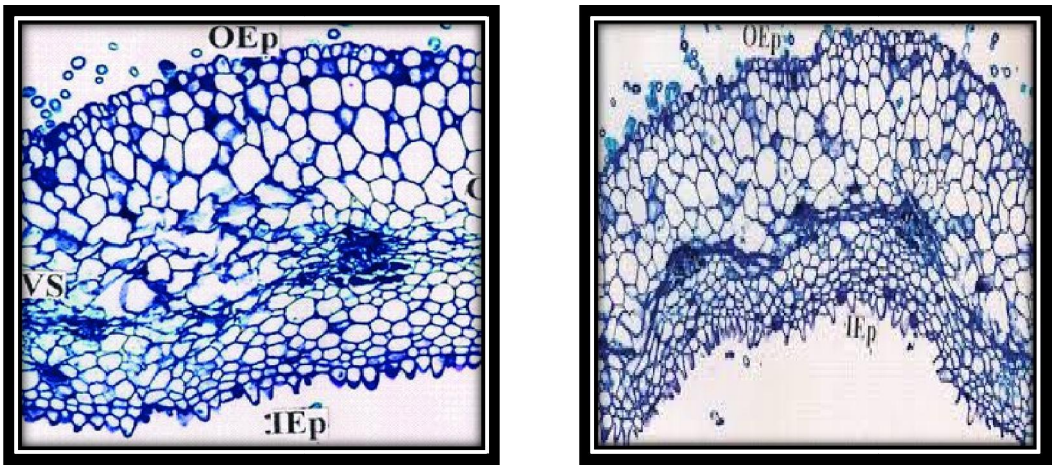

Fig.4. T.S of Butea monosperma Seed

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c. Powder microscopic study:

The crude powder of Butea monosperma un-ripe seed was Creamiest whitesh green in colour, fine, odour was faint and taste wasSlightly acrid and bitter. The specific characteristics determined from the powder study under microscopic investigation showed small fragments of taste , broken and intact malpighian cells osteosteroids , mesophylla cells, groups of vessels,

parenchyma containing few starch grains, protein granules,mucilage and oil granules .The crude powder of Butea monosperma ripe seed was Reddish brown in colour, fine, odour was Faint and taste was Bitter.

Physicochemical analysis:

The physicochemical analysis of Butea monosperma un-ripe and ripe is given in Table 2. The loss on drying (moisture content) of un-ripe seed powder was 72.0% while that of ripe seed powder was 3.33%, The total ash of ripe seed was about 24.5 % while that of un-ripe seed was about 7.5%, The water soluble ash of unripe seed was 15% while that of ripe seed powder was 20%.The sulphated ash of un-ripe seed powder was 0.55% while that of ripe seed powder was 0.65%. In both the seeds the total ash, water soluble ash and sulphated ash of un-ripe seed was slightly less than that of ripe seed. The loss on drying and acid insoluble ash of unripe seed was slightly more than ripe seed.

Fig.5 Sulphated ash

Fig.6 Total ash value

Fig.7 Acid insoluble ash

Fig.8 Loss on drying

Table 2: Physicochemical analysisof Butea Monosperma unripe and ripe seed

Parameters	%Value (W/W) seed	
	Un-ripe	Ripe
Loss on drying	72%	3.33%
Total ash	7.5 %	24.5%

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Water soluble ash	15%	20%.
Acid insoluble ash	20.5%	13.5%
Sulphated ash	0.55gm	0.65gm

e. Qualitative phytochemical analysis of crude powder:

The qualitative phytochemical analysis of the crude powder of un-ripe seeds showed presence of alkaloids, phenols and glycoside while ripe seed showed presence of alkaloids. The solvent extracts revealed maximum amount of phytoconstituents in aqueous extract than in organic solvent extracts. It conatinssaponin as well as polyphenols like Chalcones, butein, butin etc.

IV. CONCLUSION

In both the seeds the total ash, water soluble ash and sulphated ash of un-ripe seed was slightly less than that of ripe seed. The loss on drying and acid insoluble ash of unripe seed was slightly more than ripe seed.To maintain the therapeutic efficacy of natural drugs, it is very essential to lay down quality control and standardization parameters. Pharmacognostic studies are thus very important and parameters established in such studies can act as reference standards and identity of that particular plant and part. The quality, purity and authenticity of the drug can be maintained which in turn will help to maintain its efficacy. Such studies are attempted for herbal drugs involving different parts of the plant for eg. Flower, root, stem, root, leaf and stem, fruit, stem, bark etc. The Butea Monospermais a versatile tree and all the parts are very useful in the treatment of various diseases. The pharmacognostic studies will help in establishing its botanical identity. The organoleptic, macro and microscopic character. To maintain the therapeutic efficacy of natural drugs, it is very essential to lay down quality control and standardization parameters. Pharmacognostic studies are thus very important and parameters established in such studies can act as reference standards and identity of that particular plant and part. The quality, purity and authenticity of the drug can be maintained which in turn will help to maintain its efficacy. Such studies are attempted for herbal drugs involving different parts of the plant for eg. Flower, root, stem, root, leaf and stem, fruit, stem, bark etc. The Butea Monosperma microscopic characteristics and powder study revealed the specific characters that are the diagnostic characters of this plant. It will help to identify the plant when intact or when in powder form These parameters will help to correctly identify the plant and prevent it from being adulterated. Various parameters evaluated in physicochemical analysis reveal the nature and quality of plant powder (drug) under study. Loss on drying value tells the moisture content of the sample and whether it is properly dried or not. If it is high, it will facilitate the growth of microorganisms and might render the sample to decay. The ash values gives the inorganic elements and other impurities like silica, carbonates, nitrates, sulphates present in the drug and extractive values reveal the nature of phytochemicals present and their solubility or insolubility in a particular solvent..The phytochemical analysis tells their presence and solubility in a particular solvent.

The seed powder was rich in alkaloiads, amino acid, tanic acid, steroid, phenols and flavones glycosides. Hence it can be successfully used as a natural source for anticancer, antioxidant,

antibacterial, antiinflammatory agents. Such pharmacognistic studies are reported for other plants. In conclusion, it can be stated that the parameters evaluated in this study can act as reference standards of Butea Monosperma un-ripe and ripe seeds. They are the diagnostic features of the seeds and can be useful in preparation of monograph. They will help in maintaining the identity, authenticity and purity of this important versatile medicinal plant. The information generated in this work will work as standard and help to identify the adulterants and impurities. The results of photochemical studies will help the researchers to choose proper solvent for drug formulations. All the parameters evaluated and standards laid down are enough to identify the genuine drug from adulterated drug.standard and help to identify the adulterants and impurities. The results of photochemical studies will help the researchers to choose proper solvent for drug formulations. All the parameters evaluated and standards laid down are enough to identify the genuine drug from adulterated drug.

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