



## PHYSICO CHEMICAL EVALUATION OF LEAVES OF PAVETTA CRASSICAULIS BREMEK.

Arun Patil\*

Department of Botany, Yashwantrao Chavan College, Halkarni, Kolhapur (M.S.), India \*Corresponding Author

Varsha Jadhav

Department of Botany, Shivaji University, Kolhapur (M.S.), India

**ABSTRACT** The present paper deals with physico chemical properties of leaves of *Pavetta crassicaulis* BREMEK. The standardization is carried out on the basis of physicochemical and phytochemical studies including analysis of ash, dry matter, moisture content, powder behavior, fluorescence analysis and qualitative phytochemical analysis of leaves of *Pavetta crassicaulis*. It belongs to family Rubiaceae and commonly called as Papat. It is bushy shrub and leaves variable in size and shape. Ethnomedicinal studies of Kolhapur district revealed that traditionally leaves of *P. crassicaulis* were used to treat piles and bone fracture. Phytochemical tests revealed the presence of alkaloids, phenols, tannins, reducing sugars, xanthoproteins, coumarins and saponins. The behavior of the powder drug with different chemical reagents and its fluorescence analysis were also observed. The study scientifically validates the use of plant in traditional medicine.

**KEYWORDS :** Pavetta crassicaulis, Leaf, Phytochemical, Bone fracture, Alkaloids, Traditional medicine.

### INTRODUCTION

The ancient knowledge of herbal medicine is a great source of information for scientific community, researchers and medical practitioners. In last couple of decades a new trend in the preparation and marketing of drugs based on medicinal plants has become increasingly apparent (Bisset, 1994). The curative properties of medicinal plants are mainly due to presence of various complex chemical substances of different composition which occur as secondary metabolites (Karthikeyan et al., 2013). Medicinal plants form a large group of economically important plants that provide the basic raw material for pharmaceuticals. *Pavetta crassicaulis* belongs to family Rubiaceae and commonly called as Papat is bushy shrub and leaves variable in size and shape. It is common along forest borders throughout India. Ethnomedicinal studies of Kolhapur district revealed that traditionally leaves of *P. crassicaulis* were used to treat piles and bone fracture. Review of literature reveals that the plant has not been studied physico chemically. In present paper an attempt has been made to standardize the crude drug of leaves of *P. crassicaulis* by physico chemical evaluation.

### MATERIAL AND METHODS

Ethnomedicinal information was collected through interview with traditional rural practitioners (Vaidus) as suggested by Jain 1987. Fresh plant material was collected from Kolhapur district of Maharashtra (India). Plant was identified with the help of Flora of Kolhapur District (Yadav and Sardesai, 2002).

Ash value, dry matter and moisture content of the material were determined by following the method of AOAC, Leaves were dried in shade so as to prevent decomposition of active principles and made into fine powder for the studies of powder behavior, fluorescence study and phytochemical tests as per given in Indian Pharmacopoeia. Fluorescence analysis of the powder was examined under U.V light according to the method suggested by Chase and Pratt, 1949 and Kokoski et al., 1985.

### RESULT AND DISCUSSION

#### Organoleptic evaluation

Color, taste, texture, ash value, moisture content and dry matter are recorded in table-1.

#### Powder study

Leaf powder of *Pavetta crassicaulis* was dark olive green in color and smooth in texture. Powder microscopy shows epidermal cells, parenchyma cells, trichomes and fragments of xylem vessels with reticulate thickenings.

#### Powder behavior

Powder behavior shows the presence of tannins, alkaloids, flavonoids, cystein, steroid, oils and xanthoprotein. The thick ppt obtained with picric acid for alkaloid test indicates higher concentration of alkaloids (Table- 2).

#### Fluorescence analysis

Leaf powder as such produces apple green fluorescence under visible light and 254 nm UV light while produces brown fluorescence under 366 nm UV light. Powder treated with conc. HCl produces green fluorescence under visible and 254nm while powder produces brown fluorescence under 366nm UV light (Table - 3).

#### Phytochemical tests

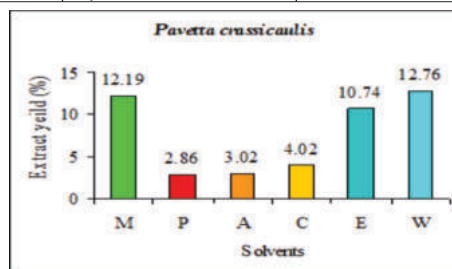
Leaf extracts shows higher concentration (+++) of alkaloids, phenols, tannins and reducing sugars; medium concentration (++) of xanthoproteins and low (+) concentration of coumarins and saponins. Anthraquinones, flavones and glycosides tests were negative (Table4).

#### CONCLUSION

The present study on physicochemical characteristics and preliminary phytochemical screening of leaves of *Pavetta crassicaulis* provide useful information. This may help in authenticating the plant along with nature of phytoconstituents present in it. The adulterants if any in the plant material can also easily identified by these studies. The study scientifically validates the use of plant in traditional medicine.

**Table No. 1: Organoleptic evaluation**

Sr.no	Particular	Observation
1	Color	Dark Olive green
2	Taste	Astringent
3	Texture	smooth
4	Ash value	4.1%
5	Moisture content	72.34%
6	Dry matter	28.66%



**Fig. 1: Solvent extraction of powdered drug of P. crassicaulis leaf**

M-Methanol, P- Petroleum ether, A-Acetone, C-Chloroform, E-Ethanol, W- Water

**Table 2: Behaviour of powdered drug with different chemical reagents**

.SN	Treatment / Reagent	Behaviour	Inference
1	Powder as such	Dark olive green	--
2	Powder + 1 N NaOH	Yellow green	Flavonoid

3	Powder + 5% Iodine	Dark olive green	-
4	Powder + 40% NaOH + Lead acetate	Green yellow	Cystein Steroid
5	Powder + Conc.H2SO4	Dark brown	Xanthoprotein
6	Powder + Conc. HNO3 + Ammonia	Yellowish brown	
7	Powder + 5% FeCl3	Dark green	Tannin
8	Powder + 5% KOH	Dark olive green	--
9	Powder + 1% AgNO3	Dark olive green	-
10	Powder + Sudan III	Brown	Oil
11	Powder + Glacial acetic acid	Olive green	--
12	Powder + Picric acid	Greenish yellow	Alkaloid

**Table 3: Fluorescence characters of powdered drug under Visible and U.V. light**

SN	Treatment / Reagent	Visible	254nm	366nm
1	Powder as such	Apple green	Apple green	Brown
2	Powder + NaOH in water	Brown	Yellow green	Brown
3	Powder + NaOH in Alcohol	Olive drab	India green	Brown
4	Powder + Conc. HCl	Apple green	Green	Brown
5	Powder + Conc. H2SO4	Pakistan green	Green	Brown
6	Powder + Conc. HNO3	Amber yellow	Yellow green	Black
7	Powder + Conc. HNO3	India green	Green	Black
8	Powder + 10% HCl	Lawn green	Lawn green	Brown
9	Powder + Acetone	Olive green	Dark olive green	Brown
10	Powder + 5% KOH	Apple green	Bright green	Brown
11	Powder + Iodine	India green	Olive drab	Brown
12	Powder + FeCl3	Apple green	green	
	Powder + D.W.		Yellow green	

**Table 4: Phytochemical tests**

Chem. constituents	Solvents					
	Methanol	P. ether	Acetone	Chloroform	Ethanol	Aqueous
Phenols	+++		+++		+++	+++
Anthraquinones						
Flavones						
Tannins	+				+	+++
Coumarins		+	++	+		
Saponins	+				+	+
Alkaloids	+++		++	++	++	
Reducing sugars	+					+++
Xanthoprotein			++			++
Glycosides						

(+ = Low, ++ = Medium, +++ = High, = Absent)

## REFERENCES

- 1) Bisset, NG. (1994). *Herbal drugs and Pharmaceuticals*. CRC Press, Boca Raton.
- 2) Karthikeyan, S., Sivakumar, A., Anbalagan, M., Nalini, E. and Gothandam, KM. (2013). *J. Pharmaceutical Sci. and Res.* 5(3): 67-71.
- 3) Jain, SK. (1987). *A manual of Ethnobotany*. Scientific Publishers, Jodhapur India.
- 4) Yadav, SR. and Sardesai, MM. (2002). *Flora of Kolhapur District*. Shivaji University, Kolhapur.
- 5) AOAC. (199). *Official Methods of Analysis*. Association of official Analytical Chemists, Washington. DC.0.
- 6) Chase, CR., and Pratt, R. (1949). *J. Amer. Pharm. Assoc.* 38(6): 324 - 331.
- 7) Kokoski, JC., Kokoshi, RJ. and Slama, FJ. (1958). *J. American Association.* 47: 715.