

**EVALUATION OF PHARMACOGNOSTICAL STUDIES OF THE PLANT  
*POLYCARPAEA AUREA* WIGHT AND ARN**

Alan Jacob\*, Rajendra Prasad M.R, Dr.(Sr). Molly Mathew, Sreepriya TK, Sarathlal P.S.

Malik Deenar College of Pharmacy Kerala, Kasaragod

**ABSTRACT**

The present study is mainly focused on the pharmacognostical features of the plant *Polycarpaea aurea* Wight & Arn (caryophyllaceae). It is an annual or perennial erect herb, 30cm height, sometimes shorter. The macroscopical, microscopical and microchemical evaluations were carried out. Microscopical evaluation reveals the presence of epidermis, fibres, sclerenchyma, medullary ray, vascular bundle and ground tissue. The physico-chemical parameters such as moisture content, ash values, extractive values and foreign matter of the plant were also carried out. The species of *Polycarpaea* are used for many medicinal purposes such as in diabetes, reduction in cholesterol level, anti microbial action, hepatoprotective activity etc.

**Key words:** *Polycarpaea aurea* Wight & Arn

**Author for correspondence****Alan Jacob,**Department of Pharmacognosy,  
Malik Deenar College of Pharmacy,  
Seethangoli, Kasaragod.

Email: alan.jacob6@gmail.com

**INTRODUCTION**

*Polycarpaea aurea* Wight & Arn is a herb of annual or perennial, small shrubs with taproots slender to stout, stems are erect, branches are terete, leaves opposite, sometimes appearing whorled belonging to the family of Caryophyllaceae. It is widespread species but mainly of temperate or warm temperate occurrence in the North hemisphere, with principal centers of distribution in the Mediterranean region and West Asia to West China and the Himalayas, fewer species in Africa, South of the Sahara, America, India and Oceania with 30 genera and 390 species. The whole plant is used as a diabetic and diaphoretic. The native

practitioners in and around Chittoor District, India, have claimed that the whole plant is being traditionally used in the treatment of diarrhea. According to folk medicine the plant is used as antioxidant, anti-inflammatory and antimicrobial (1, 2)

**MATERIALS AND METHODS****Plant collection**

The plant *Polycarpaea aurea* Wight & Arn were collected from Kasaragod. The plant material was taxonomically identified by the botanist, Mr. Biju P, Assistant professor, Department of Botany, Government College, Kasaragod. The plant dried under shade for about 7 days and then powdered with mechanical grinder and stored in an air tight container.

**Macroscopic evaluation**

This refers to the evaluation of drug by colour, odour, size, shape, taste and special features (3-4).

### Microscopic Evaluation

The transverse section of the stem and powder of the drug were used for this study. Both qualitative and quantitative studies were done. Chemical tests were carried out to detect the presence or absence of various chemical constituents such as alkaloids, glycosides, phenolic compounds, flavones, saponins, sterols etc (5, 6)

### Quantitative Microscopy

It is carried out to determine the length and width of fibres present on the drug (3).

### Physico-Chemical evaluation

Physico-chemical parameters such as moisture content, ash value (acid insoluble ash value, water soluble ash value), extractive value (water soluble & alcohol soluble extractive value) and presence of foreign matter were determined (3, 7)

**RESULTS AND DISCUSSION** Macroscopic evaluation was done by means of organs of sense. This included evaluation of drug by colour, odour, size, shape, taste and special features including touch, texture etc. **Table no: 1** shows the macroscopical characters of the plant and **Figure no: 1** shows the macroscopical characters such as leaf, flower, and stem of the plant *Polycarpaea aurea*. **Figure no: 2** shows transverse section of a stem which shows epidermis, cortex and a ground tissue. Epidermis forms outer most layer, consist of single row of cells which is large tangentially flattened cells with tight junctions and a well defined cuticle extending over it. Cortex lie below

the epidermis which consist of large rounded parenchymatous cells containing a layer of sclerenchyma consist of few layers of parenchyma in which sclerides are arranged in a single layer. Each scleride is more or less rectangular and pitted with thickened inner and radial walls. Few layers of radially elongated medullary rays lying between vascular bundles. Bicolateral vascular bundles arranged in a ring containing xylem and phloem. Thin walled parenchymatous ground tissue cells extending from the region of vascular bundles to the pith cavity.

**Figure no: 3** shows powder characters such as epidermis, fibres, medullary ray and sclerenchyma.

Quantitative microscopy of fibres were done using projection microscope. The eye piece micrometer was calibrated using stage micrometer (calibration factor: 3.52µm). The coarsely powdered drug was stained with phloroglucinol and concentrated HCl. Then the length and width of fibres were measured.

**Table no: 2** shows maximum and minimum length and width of fibers.

**Table no: 3** shows the physicochemical parameters such as moisture content, ash values, extractive values and foreign matter. The phytochemical screening of the plant shows the presence of alkaloids, phenolic compounds, carbohydrates, flavanoids, proteins, saponins, gums and mucilage which included in the

**Table no: 4**

**Table No: 1 Results after Macroscopic Evaluation of the plant *Polycarpaea aurea***

Macroscopic features	
1. Colour	Leaves – Green Stem - Pink Flower - white Seeds- purplish brown Capsules- reddish brown
2. Odour	Odourless
3. Taste	Astringent
4. Size	Leaves- 10-50 x 1-2 mm Capsules- 1.2x 1 mm Seeds- 0.5 x 0.3 mm Flowers- 3 mm long

<b>5. Shape</b>	Leaves- opposite, rarely pseudovercillate due to presence of secondary leaves in axils, sessile, linear, obtuse at base, entire at margin, mucronate apex Flowers- bracteoles: ovate-lanceolate, entire, acute, grey with a faint brownish tinge; pedicels-1 mm long, pubescent. Sepals 5, free, ovate-lanceolate, entire, acute,. Petals 5, free, oblong-obovate, obtuse, partly enclosing capsule, shining, brown. Stamens 5, forming a cup 0.2 mm high at base with petals and encircling ovary. Ovary 1-loculed, free from base, conic, obtuse, style slender, 0.4 mm long, 3-fid. Capsules- Capsules ovoid-elliptic, small-stiped, 3-valved; tips faintly incurved when young, re curved after dehiscence Seeds- seeds 3-5, reniform, radiating lines at attachment and a groove.
<b>6. Texture</b>	Rough
<b>7. Fracture</b>	Complete

**Table no: 2 Results showing maximum and minimum length and width of fibers**

Sl. no	Parameters of fibers	Average ( $\mu\text{m}$ )	Maximum ( $\mu\text{m}$ )	Minimum ( $\mu\text{m}$ )
1	Length	35.56	429.44	38.72
2	Width	8.45	17.6	3.52

**Table no: 3 Results showing Physico-Chemical evaluation of the plant**

Sl. no	Parameters	Average yield(%w/w)
1	Moisture content	10.68
2	Total ash	6.5
3	Acid insoluble ash	2
4	Water soluble ash	3.5
5	Alcohol soluble extractive value	8.53
6	Water soluble extractive value	12.26
7	Foreign matter	0.36

Table no: 4 Results showing phytochemical screening of the plant

Sl no	Phytoconstituents test	Pet.ether extract	n-hexane extract	CHCl <sub>3</sub> extract	Acetone extract	Ethanol extract	Aqueous extract
1	Alkaloids			+	+	++	+
2	Glycosides	-	-	-	-	-	-
3	Phenolics				+	++	++
4	Flavones & flavanoids				+	++	++
5	Carbohydrates					+	+
6	Proteins & amino acid					+	
7	Terpenoids						
8	Sterols	+	+				
9	Saponins						++
10	Gums & mucilage				+	+	++
11	Volatile oil	Absent					



Flower

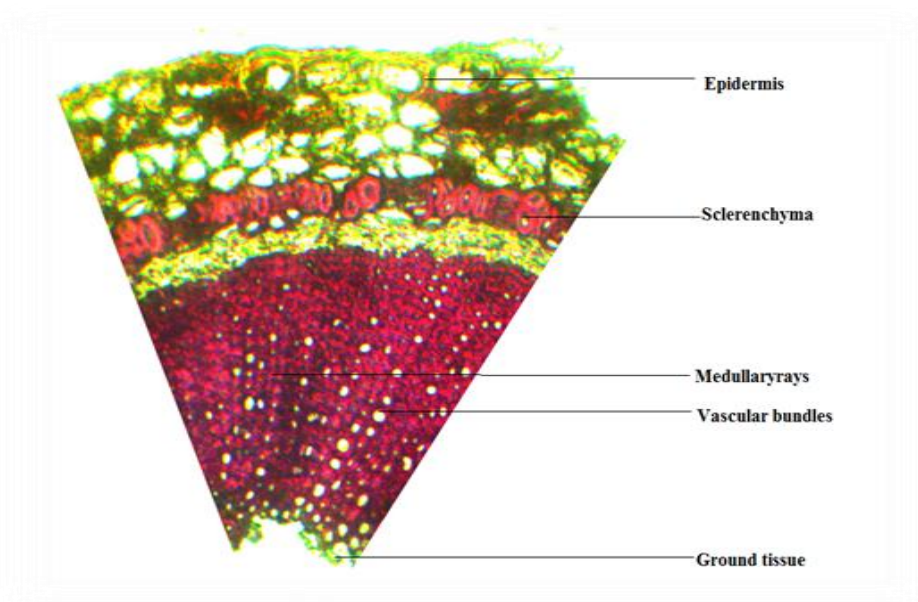


Stem

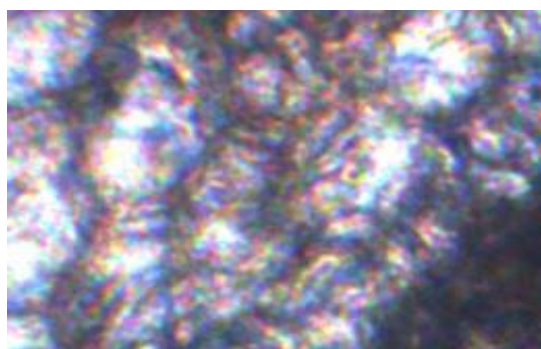


Leaf

Fig no: 1 Macroscopical characters of *Polycarpaea aurea*



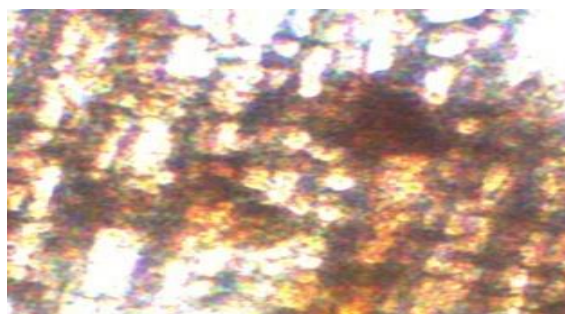
**Fig no: 2** Transverse section of stem of *Polycarpaea aurea*



**Epidermis**



**Fibre**



**Medullary ray**



**Sclerenchyma**

**Fig no: 3** Powder characters of *Polycarpaea aurea*



The plant *Polycarpaea aurea* were collected, authenticated, dried and subjected to macroscopic evaluation to identify the color, odour, size, shape, texture, taste etc of plant. Microscopical studies were done to identify the microscopical characters. Epidermis, Cortex, Medullary rays, Vascular bundles and Ground tissue were identified in the transverse section of the stem of plant. Cortex, fibre, sclerenchyma and medullary rays were found in powder analysis and determined the length and width fibres by quantitative microscopy. On pharmacognostical investigation, drug show the presence of moisture content, foreign matter, total ash, acid insoluble and water soluble ash, alcohol soluble and water soluble extractives. In the ash values, the percentage yield of acid insoluble ash was found to be less than that of water soluble ash and in extractive values, water soluble extractive value of the whole plant were found to be more than alcohol soluble extractive value. Acid insoluble ash value was found to be less than that of water soluble ash value and alcohol soluble extractive value was found to be less than that of water soluble extractive value.

***Polycarpaea aurea* Wight & Arn** (caryophyllaceae) is a herb of annual or perennial, small shrubs with taproots slender to stout, stems are erect, branched, terete, leaves are opposite, sometimes appearing whorled. The present study focused on the pharmacognostical studies like moisture content, ash value, extractive value, fibre length, histology of stem and powder microscopy etc. The result obtained from the pharmacognostical studies, observed different morphological characters like color, odour, texture, taste etc. Epidermis, Cortex, Medullary rays, Vascular bundles and Ground tissue were identified in the transverse section of the stem of plant. Cortex, fibre, sclerenchyma and medullary rays were found in powder analysis and determined the length and width fibers.

In the ash values, the percentage yield of acid insoluble ash was found to be less than that of water soluble ash and in extractive values, water soluble extractive value of the whole plant were found to be more than alcohol soluble extractive value.

## ACKNOWLEDGEMENT

This work was guided by Mr.Rajendra Prasad M.R and supported by Dr.(Sr). Mol ly Mathew, Principal Malik Deenar College of Pharmacy.

## REFERENCES

1. Sunil Kumar Reddy T, Rakesh Kumar Reddy P, Vidyadhar Reddy M, Balaji Naik M, Akhila J and Sireesha MV. Evaluation of antidiarrhoeal activity of methanolic extract of *Polycarpaea aurea* in albino wistar rats. *Int J of Innovative Pharma Research(ijpr)*. 2011; 2(1): 84-87.
2. <http://Indiabiodiversity.org/species/show/263048>.
3. Dr. Pulok K Mukherjee. *Quality control of herbal drugs, An approach to evaluation of botanicals*, 1<sup>st</sup> ed, Pharmaceutical publishers; New Delhi, 2002, 554-599.
4. Dr. Kandelwal KR. *Practical pharmacognosy techniques and experiments*, 18<sup>th</sup>ed. Nirali prakashan, Pune, 2007,10-29.
5. Kokatae CK, Purohit AP, Gokale SB. *Pharmacognosy*, 11<sup>th</sup>ed, Nirali prakshan, Pune, 1999, 97-113.
6. Kokatae CK. *Practical Pharmacognosy*. 4th ed, Vallabh prakshan, Delhi, 2008, 21.
7. Iyengar MA. *Pharmacognosy of powdered crude drugs*, 14<sup>th</sup>ed, Manipal press Ltd, Manipal, 2007, 15-27.