



Research Article

Pharmacognostic Evaluation of an Ethnomedicine - *Uvaria narum* (Dunal) Wall.

Subrahmanya Padyana¹, Ashalatha.M², Radhakrishna Rao³, Soumya Saraswathi⁴

¹Department of Post Graduate Studies in Dravyaguna Vijnana, Alva's Ayurveda Medical College Moodbidri, Karnataka, India.

²Department of Post Graduate Studies in Dravyaguna Vijnana, Govt. Ayurveda Medical College, Bangalore, Karnataka, India.

³Retired. Prof. of Botany, Udupi, Karnataka, India.

⁴Department of Ayurveda Siddhanta, Alva's Ayurveda Medical College Moodbidri, Karnataka, India.

ABSTRACT

Uvaria narum (Dunal) Wall. belongs to the family Annonaceae which is a successful ethnomedicinal plant in skin disease, particularly in Pityriasis, commonly used by the ethnomedical practitioners of the Kalanjimale range in Dakshina Kannada(D.K) District of Karnataka state. Hence to explore its identity, the pharmacognostical study of the root of the plant *Uvaria narum* (Dunal) Wall. was undertaken. The transverse section of root shows the cortex, interrupted by some secretory cells containing granular reddish brown essential oil and resin, patches of secondary phloem and thick walled lignified cells. Medullary rays are 3-6 layered and are filled with starch grains. Starch grains and calcium oxalate crystals are found in the cortex. Powder microscopy shows the presence of fragments of sclerenchyma fibres, scalariform and pitted vessels.

Key words: *Uvaria narum* (Dunal) Wall, Root, Kalanjimale, Ethnomedicine, Pharmacognostical study.

1. INTRODUCTION

The medicinal plants are known as one of the gifts of nature to cure number of disease of human beings. The interest in herbal medicines has never ceased since Vedic period. Traditional medicines provide an extremely vast body of source material for the development of new drugs. Recent ethno-botanical surveys have given valuable information about the medicinal uses of certain medicinal plants.

An ethno-medico-botanical survey has been carried out during 2006-2008 at Kalanjimale range in D.K. District of Southern Karnataka. About 234 plants were documented for their ethno-medical uses during this period. *Uvaria narum* (Dunal) Wall. is one such plant, known as Karimaderi in Kannada and Kakkepandel in Tulu¹. The roots of the plant are used by the ethno-medical practitioners of Kalanjimale range to treat the patients suffering from skin diseases such as Pityriasis and Eczema and also in Constipation.

Upon searching in the literature, it has been found that the plant is also being used in Fever, Jaundice and Herpes^{2, 3}. Reference of its nomenclature in regional languages along with its uses is found in the text Medicinal Plants used in

Ayurveda⁴. The recent books such as Indian Medicinal Plants mentioned the Sanskrit name of the plant as Neelavalli². The chemical profile of the plant shows that Acetogenins, including stereoisomers are important constituents of the root bark⁵. Glutinine, glutinol, taraxerol, beta-sitastriol and benzyl benzoate have also been found isolated⁵. But, the earlier information on the pharmacognostic studies of the root of the plant is lacking. Hence to explore its identity, the present pharmacognostic study of the root of the plant *Uvaria narum* (*U. narum*) was undertaken.

2. MATERIALS AND METHODS

The roots of the plant *U. narum* were collected from the Kalanjimale range, Bantwal Taluk, D.K. District of Karnataka. The specimen was identified and authenticated by an expert botanist. A voucher specimen of the plant is deposited (AAMC/SP/28) in the herbarium of the Department of P.G. Studies in Dravyaguna, Alva's Ayurveda Medical College, Moodbidri.

Free hand sections of the root of *U. narum* were taken for the microscopic studies by following the plant

microtechnique⁶. The sections were first stained with iodine to examine their nature. Further, the sections were cleared with chloral hydrate to observe cell contents like crystals of calcium oxalate, non-lignified tissues etc. The sections were also stained with various reagents like phloroglucinol, HCl and iodine. Powder slides of various parts were separately prepared by using distilled water, iodine, chloral hydrate, phloroglucinol and HCl⁷.

3. RESULTS AND DISCUSSION

3.1 Morphology

It is a large woody stellately pubescent, stragling shrub with dark bluish green leaves. Leaves alternate, distichous oblong-lanceolate, acute, glabrous, shining above; petioles short. Flowers solitary, terminal, reddish, 2.5-3.7 cm in diameter; pedicels 2.5-3.8cm long. Sepals 3, orbicular-ovate, connate at the base. Petals usually 6, sometimes 7-8, ovate, connate at base. Berries globose-cylindrical, red when ripe. Seeds ovoid or compressed, light brown⁸ (Figure 1).



Fig. 1: Morphology of *Uvaria narum*

3.2 Macroscopy



Figure 2 Macroscopy of *Uvaria narum* roots

The roots were cylindrical in shape and 2-7 mm in diameter. The outer surface was reddish-brown in colour, deepens with age. Longitudinal wrinkles were present on external surface (Figure 2). The inner surface was dirty white. Fracture of the roots was fibrous. The taste was predominantly astringent and slight bitter with characteristic odor.

3.3 Microscopy

The transverse section was circular to oval in outline with eccentric arrangement of xylem elements and cortex. The xylem occupies more than half of the section. The detailed transverse section exhibited 3-7 layered cork cells as the outermost covering (Figure 3). The number of layers was found increasing with the age of the plant. They were filled with brownish contents. The phellogen (cork cells) was almost uniform in shape. The phellogen was clearly seen as tangentially elongated cells. Phellogen which follows the phellogen was found associated with some crushed primary cortical cells. The secretory cells with granular reddish-brown contents of essential oil and resin were found in secondary cortex (Figure 4 & 5). This region was found interfered with secondary phloem and thick walled lignified fibres. Vascular cambium was apparently found separating xylem from the above tissue. 3-6 layered medullary rays were found extending up to secondary phloem region. The cells were radially elongated and filled with starch grains (Figure 6). The pith found in the young root, gradually disappears with age. Starch grains were found throughout the section. Prismatic crystals of calcium oxalate and rarely clusters of calcium oxalate crystals were found in the cortex. (Figure 7).

3.4 Powder Microscopy

The powder was grayish-green in colour with astringent taste. Microscopically, it exhibited the fragments of sclerenchyma fibres, scalariform vessels and pitted vessels, parenchyma cells and phloem elements in surface view (Figure 8) along with cork cells and parenchyma cells in sectional view. The starch grains were found in abundance with few prismatic crystals of calcium oxalate.

U. narum is popularly known as Karimaderi in Kannada and Kakkepandel in Tulu in Dakshina Kannada District of Karnataka state. The roots of the plant are used both internally and externally in the disease Pityriasis and Eczema by the local ethnomedical practitioners since long period.

The plant showed the presence of phenols, tannins, antioxidants and antibacterial activity to a remarkable level. The presence of these phyto constituents in plants have been attributed to various medicinal properties like anticancer, antioxidant and antimicrobial activities as has been documented in literature⁹.

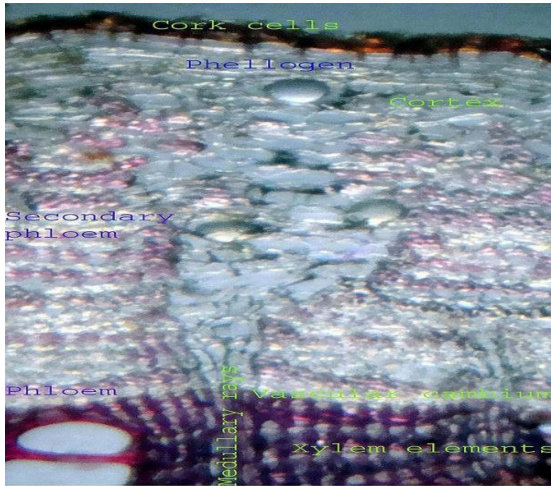


Figure 3 Outline of TS matured root

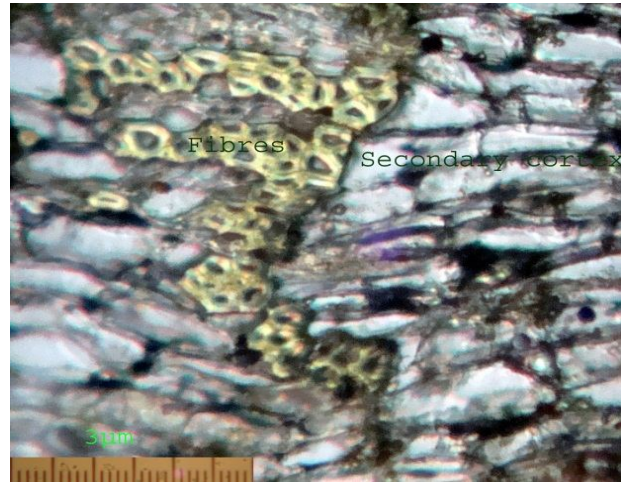


Figure 4 Fibres and secondary cortex

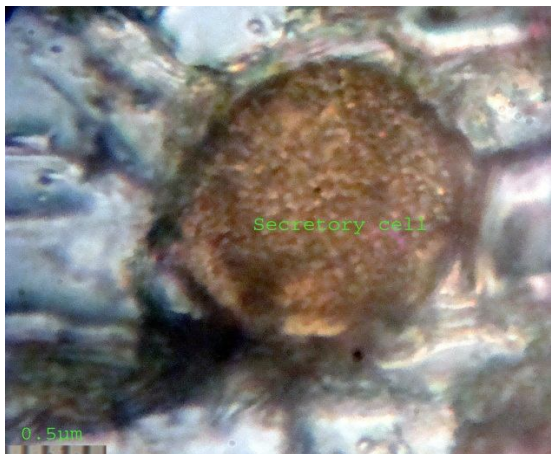


Figure 5 Secretory cell

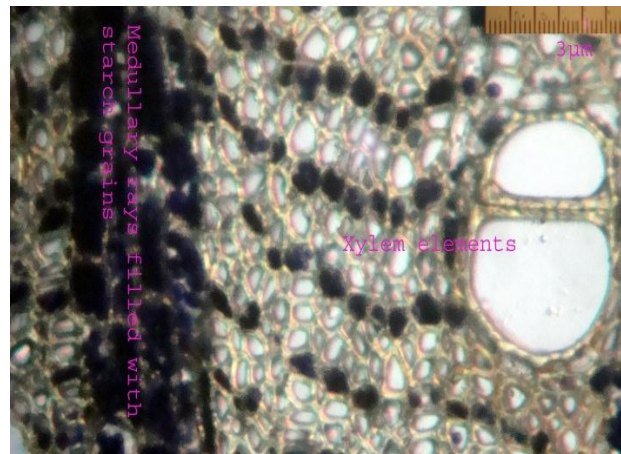


Figure 6 Starch grains spreaded over medullary rays and parenchyma of xylem

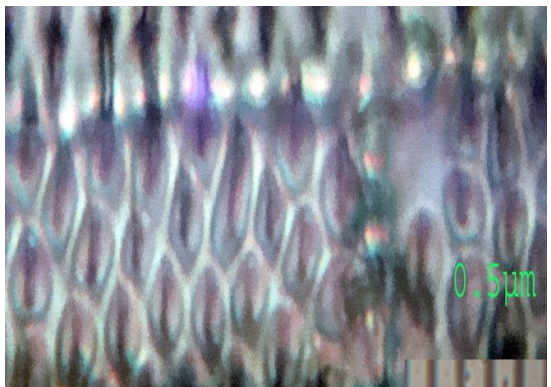


Figure 7 Bordered pitted wall of calcium oxalate crystal

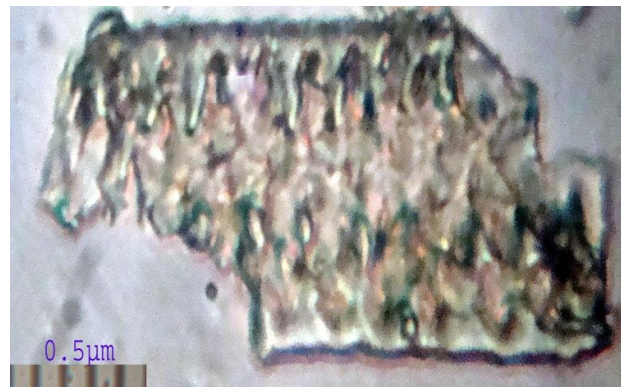


Figure 8 Fragment of scalariform vessel surface view

4. CONCLUSION

A scandent shrub with globose-cylindrical, red, aggregate fruit and aromatic odour of the root are the distinguishing character of the plant. Macroscopically the root shows longitudinal wrinkles and fracture is fibrous. T.S. of root shows the cortex, interrupted by some secretory cells containing granular reddish brown essential oil and resin, patches of secondary phloem and thick walled lignified cells. Starch grains and calcium oxalate crystals are found in the cortex. However, further studies like experimental and clinical studies can be conducted to explore its utility.

5. ACKNOWLEDGEMENTS

The authors grateful to the Chairman, Alva's Education Foundation, Moodabidri and Principal, A L N Rao Memorial Ayurvedic Medical College, Koppa for their kind support to complete the Pharmacognostic study.

6. REFERENCES

- 1) Bhat Gopalakrishna K, Flora of Udipi, Indian Naturalist,Udipi. 2003.
- 2) Varier P.S., Indian Medicinal Plants, Vol. 5. Orient Longman, Madras, 1993.
- 3) Bhat Satyanarayana, Janapada Vaidyadalli Sasya Vaividhya(Kannada), M.R.L. Infotech Service, Bangalore,2004.
- 4) S.K.Sharma et.al., Medicinal Plants used in Ayurveda, Rashtriya Ayurveda Vidyapeeta, New Delhi, 1998.
- 5) Khare C.P., Indian Medicinal Plants, Springer (India) Private Limited.,New Delhi, 2007.
- 6) Johansen, D.A., Plant microtechnique, McGraw Hill Book Co., New York,1940.
- 7) Subrahmanya P, Pharmacognostic Studies on Kuchandana (*Adenantha pavonina* L.) Humdard Medicus,Vol XLVIII, No. 2, 2005.
- 8) J. D. Hooker, 1885, Flora of British India, Vol. I, Authority of Secretary of State for India in Council Healthy Brothers, London.
- 9) Padyana Subrahmanya, Ashalatha M., Radhakrishna Rao. Evaluation of Antibacterial and Antioxidant Properties of *Uvaria narum* (Dunal) Wall. International Research Journal of Pharmacy, 2011.