

Short Communication

Pharmacognostic profiles of bark of *Careya arborea* Roxb.

A. Wadkar Kiran and S. Magdum Chandrakant

Appasaheb Birnale College of Pharmacy, Sangli 416416, Maharashtra, India.

Accepted 16 October, 2013

In the present study, we have carried out pharmacognostic evaluation of the bark of *Careya arborea* Roxb. (Lecythidaceae). Initially, organoleptic evaluation was carried out followed by detail microscopical evaluation including the study of transverse section (T.S) and microscopic characteristics of powdered bark of *C. arborea* (Lecythidaceae). Under physical evaluation; total ash, sulphated ash, water soluble ash and acid insoluble ash were determined. Water soluble and ethanol soluble extractive values were also calculated. Loss on drying was carried out for determination of moisture content. Various chemical tests were carried out for qualitative determination of nature of phytoconstituents in the bark of *C. arborea* Roxb. (Lecythidaceae).

Key words: *Careya arborea*, lecythidaceae, microscopical characteristics, T.S., physical evaluation.

INTRODUCTION

Careya arborea (Lecythidaceae) is a medium sized deciduous tree; bark is dark grey exfoliating in thin strips, alternate leaves 15 - 30 by 7.5 - 15 cm., broadly obovate or obovate-oblong, rounded or shortly acuminate, crenate-denticular, rather membranous, glabrous, lateral nerves 10 - 12 pairs; petiole 0 - 1.8 cm long, stout, margined, flowers 6.3 - 9 cm. across, white, ill-smelling, sessile, (Kirtikar, 1991). Methanolic extract of bark is potential source of natural antimicrobial and antioxidant agents (Kumar et al., 2006). Bark of *C. arborea* showed analgesic (Ahmed et al., 2002) and antidiarrhoeal (Rahman et al., 2003) activities. When it was tested against carbon tetrachloride induced liver damage in rats, it showed hepatoprotective and in vivo antioxidant effects (Kumar RS et al., 2005).

MATERIALS AND METHODS

Plant material

The bark of the *C. arborea* were collected from Dajipur jungle (Radhanagari wild life sanctuary), Kolhapur, Maharashtra. The plant

was authenticated by Botany Department, Willingdon College, Sangli and also by Dr. S. S. Sathe. The voucher specimen has been preserved in our laboratory for future reference.

Pharmacognostic studies

Organoleptic evaluation of bark was carried out. Behavioural characters of powdered bark of *C. arborea* were carried out under UV (Short wavelength) and visible light by using different chemical reagents. Microscopic study of bark was carried out with the help of Photo-micrographic equipment (Make- Kyowa-Getner, Model - 11UP with Bio-plus-55 software). Different staining reagents were used to study transverse section as well as microscopic characteristics of powdered bark. Under physical evaluation total ash, sulphated ash, water soluble ash, acid insoluble ash of the bark was calculated as per the procedure. Water soluble and alcohol soluble extractive values were also calculated (Kokate et al., 2006). Moisture content was determined by loss on drying (Rangari, 2002). Preliminary Phytochemical screening was carried out with different chemical reagents (Khandelwal, 2007).

RESULTS AND DISCUSSION

Bark was thick, rough, dark grey in colour, showed shallow cracks and exfoliating in narrow flakes. Bark was odourless with astringent taste. Transverse section of bark showed distinct cork, cortex and secondary phloem. The cork cells were multi-layered (8 - 16), thick walled,

*Corresponding author. E-mail: kiranwadkar@rediffmail.com.
Tel: 0233-2320062, 9850043889.

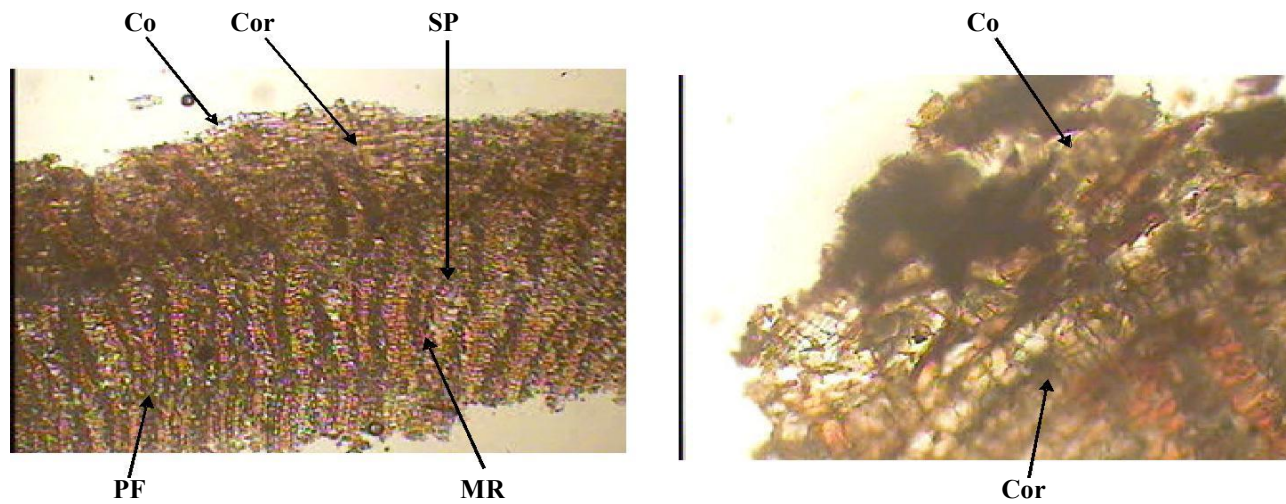


Figure 1. T.S. of *C. arborea* bark. Co- cork; Cor- cortex; SP- secondary phloem; PF- phloem fibres, MR- medullary rays.

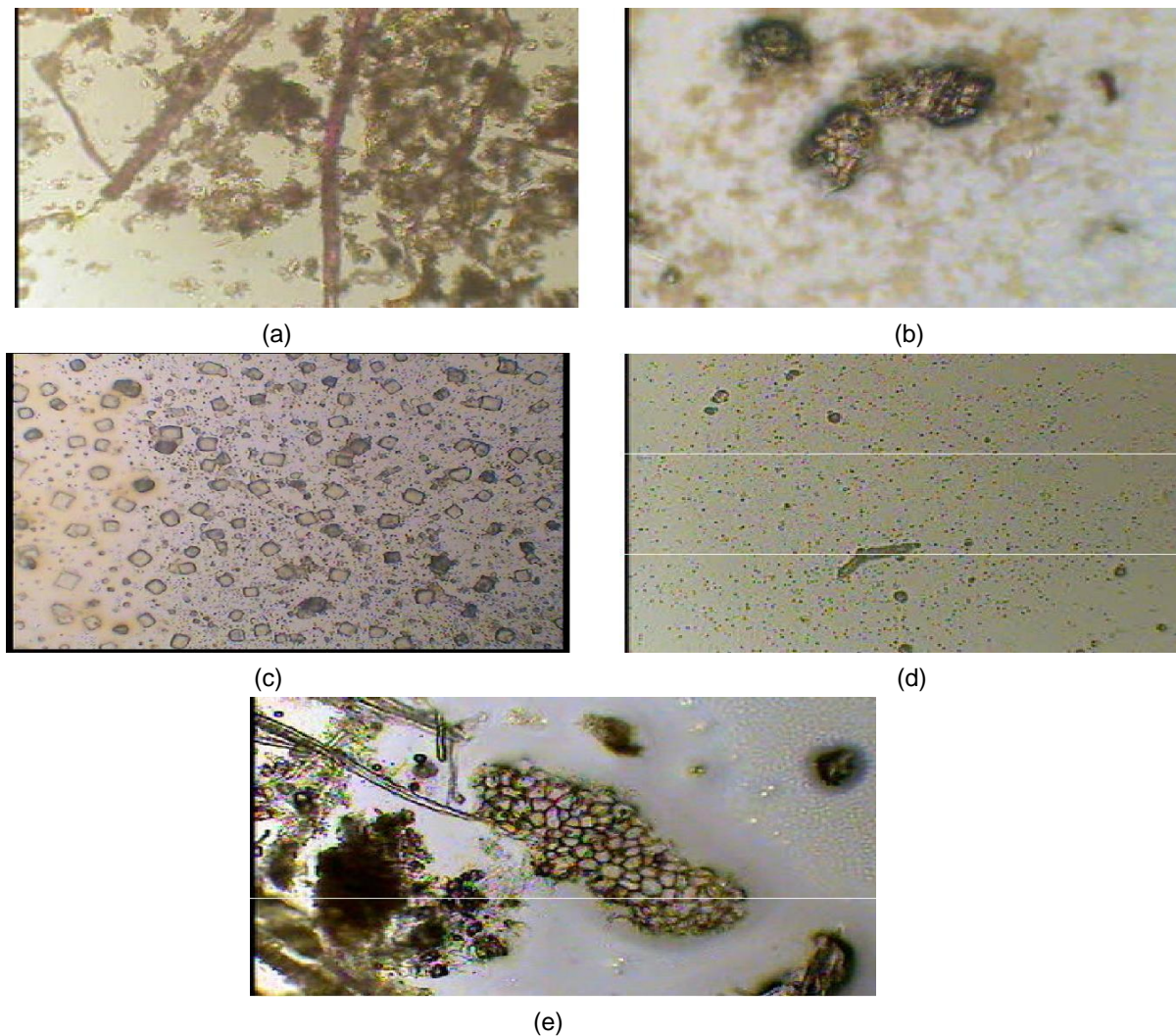


Figure 2. Microscopical characteristics of powdered bark of *Careya arborea* (a) lignified fibres, (b) cork cells, (c) calcium oxalate crystals, (d) starch grains, (e) parenchymatous cells.

rectangular, blackish brown in colour. Cork was followed by 2 - 3 layers of phellogen and then by phelloderm. Cortex was extensive, parenchymatous with rectangular to polygonal cells. Cortical cells were multilayered while some cells were golden yellow in colour with yellowish contents. Secondary phloem was made up of fibres, phloem parenchyma, medullary rays and vessels. The fibres were round in shape. They formed round patch inside the section. Medullary rays were 1 - 2 seriate. Calcium oxalate crystals were present in, cells of cortex and phloem parenchyma in secondary phloem. Starch grains were very few (Figures 1 and 2).

The Microscopic characteristic of powdered bark showed, blackish brown thick walled, rectangular to oval shaped cork cells, the fibres were lignified having very thick wall. They were long, slender and of 38 - 66 μ in length. Calcium oxalate crystals were tetragonal prism type having 10 - 15 μ in size. Starch grains were very few, simple, up to 5 μ in diameter. The parenchymatous cells were rectangular to polygonal in shape (Shanth TR et.al).

The behavioural characters of powdered bark are represented in Table 1. The physical evaluation parameters *C. arborea* bark revealed total ash (12%), sulphated ash (9.49%), water soluble ash (2%), acid insoluble ash (0.9%), water soluble extractive value (16%), alcohol soluble extractive value (7.2%) and loss on drying (14%).

The qualitative chemical tests revealed the presence of terpenoids, flavonoids, alkaloids, saponins and tannins in the bark of *C. arborea* Roxb.

REFERENCES

- Ahmed M, Rahman MW, Rahman MT, Hossain CF (2002) Analgesic principles from the bark, *Pharmazie*, 57(10): pp 698-701.
- Khandelwal KR (2007) *Practical Pharmacognosy, Techniques and experiments*, 18th Edn., Nirali Prakashan. pp 149-153.
- Kirtikar KR, Basu BD (1991) *Indian medicinal plants*, Vol. II, 2nd Edn, Periodical exports book agency, Delhi. pp 1061-1062.
- Kokate CK, Purohit AP, Ghokale SB, (2006) *Pharmacognosy*, 35th Edn. Nirali prakashan , pp 111-113.
- Kumar RS, Sivakumar T, Vijayabaskar M , Perumal P, Sivakumar P, Nethaji R, Gupta M, Mazumdar UK (2005). Hepatoprotective and *in vivo* antioxidant effects of *Careya arborea* against Carbon tetrachloride Induced Liver Damage in Rats, *Int. J. Mol. Med. Adv. Sci.* 1(4): 418-424.
- Kumar RS, Sivakumar P, Sundaram RS, Sivakumar P, Nethaji R, Gupta M, Mazumdar UK (2006). Antimicrobial and Antioxidant activities of *Careya arborea* Roxb. stem bark. *Iranian J. Pharmacol. Ther.* 5: 35-41.
- Rahman MT, Khan OF, Saha S, Alimuzzaman M (2003) Antidiarrhoeal activity of the bark extract of *Careya arborea* Roxb. *Fitoterapia*, 74(1-2): 116-118.
- Rangari VD (2002) *Pharmacognosy and Phytochemistry Part-I*, 1st Edn. Career Publications. p 90.
- Shanth TR, Pasupathy S, Yoganasimhan SN (1987) Identification, macro-, microscopic and physicochemical details of a market sample of padmaka (*Careya arborea* Roxb). *Indian J. For.*, 10: 131-139.