**ABSTRACT**

*Cissus repanda* Vahl. (Syn. C.rosea, Vitis repanda and V. rosea). Family Vitaceae, commonly known as ‘Panivel’ in Hindi, is a folklore medicinal herb, reputed for the healing properties of its roots and stem. The tribale people and Traditional practitioners of Orissa, Gujarat, Andhra Pradesh and some parts of Karnataka Dist. are found to be prescribing the root powder of this plant in case of bone fractures, cuts, boils and wounds. As yet the roots of plant has not found to be reported and hence the Roots of this plant was investigated thoroughly as per the pharmacopoeial parameters. Physicochemical parameters shows high value of acid insoluble ash indicating high polarity, preliminary phytochemical investigations shows the presence of alkaloid, tannin, mucilage and calcium salts. The microscopic characters of root shows Mucilage, rosette and acicular crystals of calcium oxalate, starch grains, tannin Stealar region shows fibres, scalariform vessels and pitted parenchyma and multisierate medullary rays.

**Key words:** *Cissus repanda*, *Vitis rosea*, Vitaceae, Evaluation, Physicochemical analysis.

**INTRODUCTION**

*Cissus repanda* Vahl. (Vitaceae) commonly known as ‘Panivel’ in Hindi, is an important medicinal plant distributed from Kumaun to Arunachal Pradesh, Tripura, Assam, Bihar, Orissa, Madhya Pradesh, and Western Ghats region up to 1350 m.[1]

It is a large climber, with soft, very porous wood with corky bark. The stem yields potable water on cutting thus the name “Panivel” (Pani-Water Vel-creeper). Leaves: simple, broadly ovate, 12-20 cm in diameter, repeatedly toothed, and tomatoes beneath less above, base deeply cordate, petiole 15-20 cm long, stipules oblong and tendrils dichotomous opposite to leaf. Inflorescence lax, umbellate branched. Flower: bracteate, bracteolate, actinomorphic, bisexual, tetramerous, hypogynous flowers reddish brown in colour. Calyx: sepals 4, fused and valvate. Corolla: petals 4, free and valvate. Androecium: stamens 4, opposite to the petals arise from the base of the disc, basified. Gynaecium: ovary 2 celled, with many ovules in each cell, ovary superior, style subulate, and stigma small. Fruit one seeded fleshy berry.[2] (Plate 1-1.1, 1.2)

The medicinal potential of *C. repanda* has been known to traditional system and widely used in folklore medicine. *C. repanda* is a well known plant and its roots and powder has been traditionally used in the form paste for cuts, wounds and bone fractures.[3,4] In spite of its reputation in these ailments it has not yet been investigated scientifically and hence it was thought worth to study it in detail. The present paper highlights macroscopic, microscopic, physicochemical and Thin Layer Chromatographic analysis of methanolic extract of roots.

**MATERIALS AND METHODS**

**Collection**

Fresh plants of *C. repanda* Vahl. were uprooted from the natural habitat from Orissa, Karnataka and Deharadun. The collected samples were identified, authenticated by using various floras and texts. The verified specimen was preserved in the departmental herbarium museum vide no. 6001/2009 for future reference.
The matured roots were separated from aerial parts, cut in to small pieces and shade dried, coarsely powdered (40 mesh) drug was used for Phytochemical and for study of the diagnostic characters of the powder. The rest of the sample was preserved in the solution of F.A.A. (70% Ethyl alcohol: Glacial acetic acid: Formalin in the ratio of 90:5:5) for the histological profile.

**PHARMACOGNOSTIC EVALUATION**[5,6,7]

**Organoleptic evaluation**
The colour, odour, and taste of the root and the powder were recorded separately.

**Microscopic evaluation**
Free hand sections were taken, cleared with chloral hydrate and then with phloroglucinol and hydrochloric acid. Histochemical tests for few constituents like tannin, mucilage etc. were also carried out. Sections and powder diagnostic characters were drawn with camera lucida and also took microphotographs by using Carl Zeiss binocular microscope.

**Physical evaluation**[6,7,8]
In physical evaluation, moisture content, ash values viz., total ash, acid insoluble ash, and extractive values viz., alcohol soluble extractive value, water soluble extractive values were determined. The ash value represents the inorganic salts present in the drug. Extracts obtained by exhausting crude drugs are indicative of approximate measures of certain chemical compounds they contain, the diversity in chemical nature and properties of contents of drug. The determinations were performed in triplicate and results are expressed as mean ± SD. The percentage w/w values were calculated with reference to the air-dried drug.

**Preliminary Phytochemical Screening**[9]
Ten gram of dried root powder was subjected to continuous soxhlet extraction with petroleum ether (60-80°C), chloroform, ethyl acetate, methanol and water for 8 hrs and the extract was evaporated to dryness. The dried extract was weighed, and percentage yields were calculated. The extract was further subjected for the presence of various constituents like alkaloids, tannins, phenolics and for saponin glycosides.

**RESULTS AND DISCUSSION**
The root is long, tuberous with smooth surface elongated 15 to 20 cm in diameter, fracter fibrous, colour externally dark brown and internally yellowish orange, odour slightly aromatic, taste at the beginning mucilaginous and later on causing itching sensation in the throat. The thick transverse section of root is somewhat spherical in outline, shows outermost narrow cork, cortex and central stellar region. (Plate.1-1.3, 1.4)

Detailed transverse section tangentially running 20 to 25 rows of suberised cork cells, phellogen is narrow one or two rows followed by 2 to 3 rows of parenchymatous cells of phelloderm, cortical parenchymatous zone laying under this being 4 to 5 layers embedded with tannin, starch grains. A few cortical cells contain rosette and acicular crystals of calcium oxalate, number of Mucilage cells also present in cortex. The central xylem is very wide composed of radially arranged groups of 2 to 5 vessels of pitted and scalariform, few thick walled fibres and parenchyma, alternating with the wide multiseriate medullary rays embedded with starch and occasional acicular crystals of calcium oxalate. Phloem encircling the xylem is narrow and wedge shaped consisting of parenchyma, sieve elements with medullary rays and are getting wider to the periphery from the centre and reach up to the inner border of the cortex with few non lignified fibres. The ray cells consist starch grains some acicular crystals of calcium oxalate. (Plate. 2 - 2.1, 2.2, 2.3, 2.4)

**Powder microscopy**
The powder of *C. repanda* root is light brown in colour, and slightly aromatic in odour, sharp mucilaginous in taste and producing itching in throat. The diagnostic microscopical characters of the powder are cork in surface and transversally cut view, rosette and...
acicular crystals of calcium oxalate scattered as such throughout or embedded in the parenchyma cells of cortex, radially cut medullary rays, simple oval to pear shaped starch grains from cortex and medullary rays, tannin content cells of cortical region, simple fibres of phloem, scalariform and pitted vessels of stealar region. (Plate 3-A to H)

**Preliminary Phytochemical Evaluation**

The various physical parameters of root and root powder viz., moisture content, ash values viz., total ash, acid insoluble ash, water soluble ash, and extractive values viz., alcohol soluble extractive value, water soluble extractive values were determined. The results of this study were shown in table. (Table-1)

The methanol extracts of the powdered root of *C. repanda* showed the presence of alkaloids, glycosides. Aqueous showed that presence of alkaloids, saponin, tannin and phenolics, calcium, mucilage. These secondary plant metabolites are known to possess various pharmacological effects might be responsible for the various actions exerted by *C. repanda*. (Table-2)

The Thin Layer Chromatography(10) revealed that methanol extraction the Rf values under U.V. radiation in short U.V. 254 nm components having double bond (unstauration) presents 8 different components are separated using silica gel C, 254 nm as stationary phase and mobile phase. Out of separated compounds, 4 are susceptible to long U.V. 366 nm. Hence short U.V. range is suitable to detect more separated compounds. T.L.C. plate observed after spray the reagent Dragendorff’s (mainly used to detect alkaloid) shows one spot at R_{f} 0.45. (Table-3)

| Table 1: physicochemical parameters root powder of *C. repanda* |
|---------------------------|-----------------------------|
| Parameters                | Value % w/w                |
| Moisture content          | 10.85                      |
| Total ash                 | 18.57                      |
| Acid insoluble ash        | 34.23                      |
| Alcohol soluble extractive| 05.20                      |
| Water soluble extractive  | 07.01                      |
| pH                        | 05.95                      |

| Table 2: Qualitative chemical screening root powder of *C. repanda* |
|--------------------------|-----------------------------|
| Phytoconstituents        | Tests                        | Results |
| Alkaloids                | Mayer’s Test                | ++      |
|                         | Dragendorff’s Test          | ++      |
|                         | Wagner’s Test               | ++      |
| Saponins                 | Foam Test                   | ++      |
|                         | Froth Test                  | ++      |
| Tannins                  | Lead Acetate Test           | ++      |
|                         | Gelatin Test                | ++      |
| Calcium                  | Calcium Test                | ++      |

++ = Present.

Plate 2: T. S. Of Root

Plate 3: Powder Microscopy

C. repanda root and its powder paste were used in the treatment of bone fractures and cuts and wounds conditions. The standardization of a crude drug is an integral part of establishing its correct identity. Before any crude drug can be included in herbal pharmacopoeia, pharmacognostic parameters and standards must be established. The results of the present investigations could serve as a basis for proper identification, collection and investigation of the plant. The macro and micro-morphological features of root described, distinguishes it from other members of the genera. The transverse section and its powder microscopy results are unique to the plant and are required in its standardization. The phytochemical evaluation revealed the presence of various secondary plant metabolites which have been claimed to be responsible for various pharmacological activities.

CONCLUSION

The Diagnostic morphological and microscopical characters were noted down for easy identification of plant material. Physico-chemical parameters have been established to identify quality and degree of purity of the plant material as per pharmacopoeial requirements. Qualitative tests indicated the presence of alkaloid, saponin, calcium, mucilage; phenolic compounds and TLC studies confirmed the same. The results are being reporting for the first time, could be useful in the identification and standardization of a crude drug the data produced in the present investigation is also helpful in the preparation of the crude drug’s monograph and inclusion in various pharmacopoeias.

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