

# PHARMACOGNOSTIC AND PHYTOCHEMICAL STUDY OF *OXALIS CORNICULATA* Linn.

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## ABSTRACT

*Oxalis corniculata* Linn. grown on moist soil belong to family Oxalidaceae, commonly called as Ambuti. The plant has been traditionally used to treat Stomachic, Fever, Jaundic, Muscular pain, Liver Problems, Dysentery, Anemia, Skin allergies, Piles and Rectum proleps diseases of human being. The wide range of phytochemicals are present in plant like Cardiacglycoside, Saponins, Tannin, Flavonoids, Glycoside and Alkaloid. The present research deals with Pharmacological and Phytochemical study of *Oxalis corniculata* Linn. Pharmacognostic study of plant drug is carried for the evaluation of drug to detect the adulteration. It includes the study of transverse section, trichomes and stomata. The present study showed that study of phytochemicals, Pharmacological details and traditional uses of *Oxalis corniculata* Linn

Keywords: *Oxalis corniculata* Linn., Pharmacological studies, Phytochemicals, Dermal characters.

## INTRODUCTION

The medicinal plant preparation is used world-wide for the treatment of different types of diseases. The plant is the most important source of herbal formulation, the herbal formulation is used in the treatment of various ailments. (Soundararajan and Sivakkumar, 2019). According to a WHO about 80% of world's population depends on traditional medicine or their primary health care. Plants used in traditional medicine contain a wide range of ingredients that can be used to treat chronic as well as infectious diseases (Karunanithi, et al., 2016). *Oxalis corniculata* Linn. grown on moist soil belong to family Oxalidaceae, commonly called as Ambuti. Stem is slender creeping on soil surface with long internode, roots are develops on nodes of stem. Leaves alternate, trifoliate, leaflets broadly obovate with long petioles. Flowers are yellow coloured, sepals five ovate, Petals five yellow. Fruit is angular capsule with an acute apex. Many seeds are present per locule. Seeds are ovoid brown coloured (Fig.No.1). *O. corniculata* is used in the traditional medicine in different region of India. The plant has been traditional used for the treatment of Stomachic, fever, jaundice, muscular pain, liver problems, dysentery, anemia, weeping eczema, skin allergies and piles of human being (Hussain, et al., 2008, Hassain, et al., 2017, Mahmood, et al., 2011, Das, et al., 2012, Kumar, et al., 2009, Omar, et al., 2020, Jyoti, et al., 2010, Nita and Haresh, 2013). Therefore, the bioactive chemicals investigation is necessary to prove proclaimed ethnomedicinal uses.

## MATERIAL AND METHODS

### a) Plant Material

The Plant *Oxalis corniculata* Linn. were collected from medicinal garden of Nutan Mahavidyalay Sailu, District. Parbhani Maharashtra. The collected plant Material was identified by using renowned floras (Naik 1979, Naik et al 1998., Chetty et al. 2008 and Yadav and Sirdesai 2002). The voucher specimen of plant was preserved in Department of Botany, Nutan Mahavidyalaya Sailu District. Parbhani. The plant is shade dried and powdered. The dried plant samples were ground properly and make into fine powder form. The powdered plants were successively extracted with different solvent. The fresh stem and leaves were used for the study of macroscopic and microscopic characters.

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### Preliminary phytochemical Screening:

Phytochemical analysis of plant extracts of *Oxalis corniculata* Linn. in different solvents were carried out by using standard methods for the analysis phytoconstituents like alkaloids, glycosides, flavonoids, tannins, saponins, terpenoids and cardiac glycosides (Harborne, 1984).

### Preparation of extract:

Plant powder was subjected to soxhlet extraction with petroleum ether (60-80<sup>o</sup>c), Methanol (64.5-65.5<sup>o</sup>c) and water for 3-4 h in the order of increasing polarity of solvents (Daniel, 1991). The extracted solvent is evaporated to make the final volume one fourth of its original volume. Yield of extracts are 3.3, 4.1 and 3.1 % respectively. The extracts are stored at 4<sup>o</sup>c in airtight bottles for further study.

## PHARMACOGNOSTIC STUDIES

### Macroscopic study:

Morphological studies were done using simple microscope. The shape, apex, base, margin, taste and odour of plant powder were observed.

### Microscopic studies:

The free hand transactions of stem was taken and stained by using double stained differential staining technique and mounted in DPX (Johanson, 1940). Photographs were taken with the help of digital camera for the study of anatomical feature of plant.

The leaf is peeled off for the study of stomata and the trichomes of upper and lower epidermis. For the study of vessels the stem is macerated by using Jeffery's fluid and stained with aqueous 1% saffranin and mounted in glycerine and made semipermanent by ringing with DPX mountant.

The plant powder was treated with phloroglucinol and HCl for the detection of lignin. Glycerin and iodine solution were used to determine calcium oxalate crystal and starch grains respectively. As a part of quantitative microscopy, stomatal number were determined by using fresh leaves of the plant (Kokate, 1997).

## OBSERVATIONS

### T.S. OF Stem

Transverse section of stem show presence of single layered epidermis with thin cuticle. Long trichomes are reported on epidermis of stem. Just below the epidermis 2 to 3 layered collenchymatous hypodermis is present. The remaining portion of stem is occupied by thin walled parenchymatous cortex. The endodermis and pericycle is not clear. Vascular bundles are conjoint, Collateral, open and endarch. In the center of stem parenchymatous pith is present (Fig.No.2).

### Stomata

Leaves alternate, trifoliate, leaflets broadly obovate with long petioles, the leaf is amphistomatic. The stomities of both the surfaces are anomocytic, the guard cells are surrounded by four or five subsidiary cells which are quite alike the remaining epidermal cells. (Fig.No. 3A and 3B).

### Trichome

Trichomes are reported on both the surfaces of leaf. The trichomes of both surfaces are uniseriate. Trichomes of upper surface are longer than lower surface; foot is embedded into epidermal cell. (Fig.No. 5A and 5B).

### Vessels

The vessels elements of the secondary xylem show variation where 50% of the vessels are with scalariform thickening. Both endwall plates are oblique and multiperforate having size 20 μm diameter and 90 μm

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length. The 50% of the vessels are with pitted thickening. Both the end wall plates oblong multiperforated having size 50  $\mu$ m diameter and 110  $\mu$ m length (Fig.No. 4).



### Phytochemical Constituents

The phytochemicals analysis gives important information about the active constituents present in plant. The phytochemical analysis of plant powder show the presence of Cardiacglycoside, Saponins, Tannin, Flavonoids, Glycoside and Alkaloid (Table No.2)

### Powder Analysis

The powder was characterized by its morphological features like greenish brown colour, presence of specific odour and sour taste. Microscopic study of leaves powder reveals the presence epidermal cells, long trichomes, stomata and calcium oxalate crystals. (Table No.1).

### DISCUSSION AND CONCLUSION

The novel techniques for identification and analyze the medicinal plants, pharmacognostic evaluation is more reliable, effective and cheap also( Muthukrishnan and Sivakkumar, 2017). The plant derived phytochemical therapy helpful for various free radical mediated diseases such as against cancer, diabetic mellitus, cardiovascular diseases and aging. The phytochemical analysis of plant drug is an important for detecting adulteration or improper handling of drug (Akalya and Subasri, 2016).

On the basis of survey, literature, reviewed the *Oxalis corniculata* Linn. is commonly used for the preparation of medicinal formulation in the treatment of different diseases. The phytochemicals and pharmacological studies also carried out with extract of the plant. The plant is commonly used by tribes and local people of different parts of India for the treatment of Stomachic, Fever, Jaundic, Muscular pain, Liver Problems, Dysentery, Anemia, Skin allergies, Piles and Rectum proleps.

The plant powder contain phytochemicals such as Cardiacglycoside, Saponins, Tannin, Flavonoids, Glycoside and Alkaloid. The powder analysis and pharmacognostic studies is useful in the identification and standardization of crude drug. The present study also helpful in the preparation of the crude drug monograph. Further Pharmacological and antimicrobial studies helps to evaluate the pharmaceutical effects of *O. corniculata* and authentication of its folkloric efficacy.

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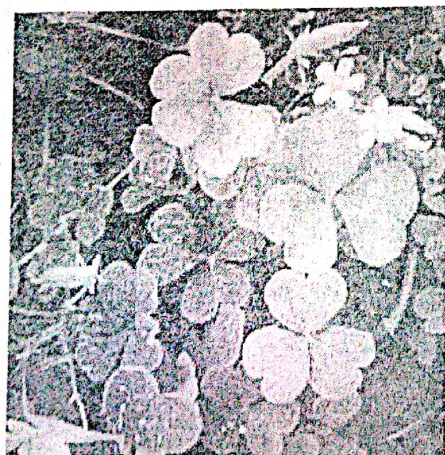


Fig. No. 1. *Oxalis corniculata* Linn.

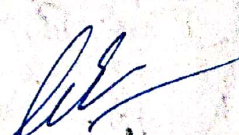
  
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Fig.No.3. A. Stomata Lower Epidermis

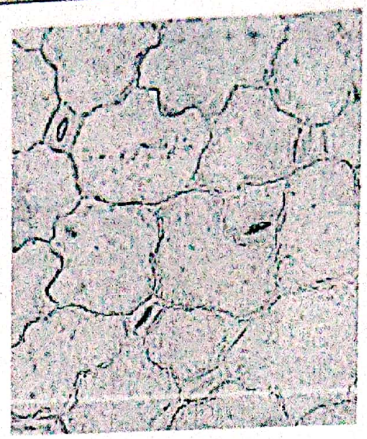


Fig.No. 3. B. Stomata Upper Epidermis



Fig.No.4. Vessels

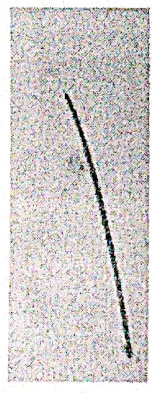


Fig.No.5A. Trichome Upper Epidermis

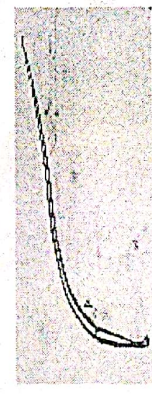


Fig.No.5B. Trichome Lower Epidermis

Sr. no	Test	Observation	Inference
1	Colour	Greenish brown	Leaves of <i>O. corniculata</i> .
2	Odour	Specific	Aromatic crude drug
3	Taste	Sour	Drug contain Glycoside

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 Table.1 Preliminary test of powdered Plant of *Oxalis corniculata* Linn.  
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Sr.no	Phytochemicals	Test	sr. no	Phytochemicals	Test
1	Alkaloid	+	6	Phlobatannins	-
2	Glycoside	+	7	Saponins	+
3	Flavonoids	+	8	Terpenoids	-
4	Tannins	+	9	Anthraquinones	-
5	Reducing sugar	-	10	Cardiacglycosides	+

Table. 2–Preliminary phytochemical screening of Plant powder (+ present and – absent)

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