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RESEARCH ARTICLE

QUANTITATIVE ESTIMATION OF SOME IMPORTANT MINERALS IN AMRUL LEAVES (LEAVES OF OXALIS CORNICULATA LINN.) - AN UNDERUTILIZED PLANT

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ABSTRACT

Oxalis corniculata Linn. has been found in many traditional systems of medicine for treating various human ailments. Studies revealed that this underutilized plant possesses anti-inflammatory, antioxidant, antimicrobial, antifungal, antiamoebal, antihelminthic, antiscorbutic, anxiolytic, anticonvulsant, antidiarrhoal, anticancer, antiulcer, antiseptic, anti- diabetic, hepatoprotective, hypolipidemic, abortificiant, and wound healing properties. It is consumed by the tribal communities as emergency food. The study was conducted to estimate the minerals content of *Oxalis corniculata* leaves which may be helpful in finding the beneficial effect related to the trace element content of the leaves. The findings revealed that *Oxalis corniculata* leaves contain high amount of calcium, iron, magnesium and zinc and trace amount of copper, lead and phosphorus. Thus it can be concluded that this plant can be incorporated in the diet as a low cost food to obtain its therapeutic benefits.

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INTRODUCTION

From the prehistoric times herbal medicines play a significant role in the treatment of diseases. The beneficial effect of these plants and herbs were also recorded in ancient manuscripts, ayurveda and unani medicine. In developing countries due to high cost of treatment, people depend on herbal medicine as a low cost remedy for curing diseases. *Oxalis corniculata* Linn., commonly known as yellow wood sorrel is a very common and useful medicinal plant. It has been used since ages for the treatment of various ailments and as an emergency food. It is also easily available in a subtropical country like India. This scenario has prompted us to evaluate the nutritive and medicinal values of *Oxalis corniculata* Linn.

Plant details

Taxonomic Classification (Hemant *et al*., 2011)
Kingdom : Plantae
Division : Magnoliophyta
Class : Magnoliopsida
Order : Oxalidales
Family : Oxalidaceae
Genus : Oxalis
Species : *O. Corniculata*

Oxalis corniculata leaves

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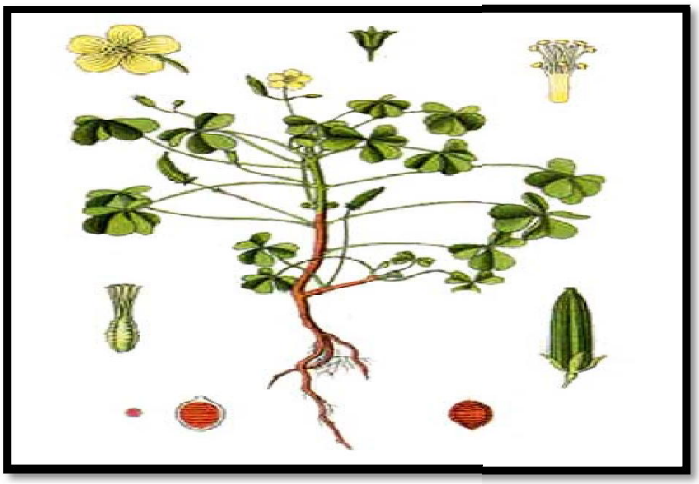
Distribution

It is a somewhat delicate-appearing, low-growing, herbaceous plant abundantly distributed in damp shady places, roadsides, plantations, lawns, nearly all regions throughout the warmer parts of India, especially in the Himalayas up to 8,000 ft-cosmopolitan. (Hemant *et al*., 2011)

Morphology

They are tap rooted herbs, bushy or mat forming, and 0.1-0.5 m tall. Branching from the base and often rooted at the nodes, the upper portions are ascending or weakly erect smooth or hairy (David *et al*., 1996).

a) Stem: The stem is slender, terete and pubescent, 0.4 to 1.5 cm long. The internodes vary from 4.5 to 8.5 cm in length. Acidic odour, taste sour when fresh (Mary *et al*., 2001)
b) Leaves: The trifoliate leaves are alternate, with thin, heart-shaped, leaflet blades having a distinct apical indention. Leaflets 0.5 to 1 cm long with reticulate venation. The blades are smooth on the upper surface, slightly folded upward lengthwise along the major vein, and have a few appressed hairs along the veins on the lower surface and along the lower portion of the margins. The leaves are arranged alternately along the stems. A single long stalk arises from the axils of the leaf, from which extend three flower stalks, each with a single flower.
c) Flowers: The flowers are 7-11 mm wide and have 5 yellow petals. (David *et al*., 1996)
d) Fruit: The fruit is a capsule, 1-1.5 cm long, cylindrical, pointed apically, and 5-ridged in cross section. (David *et al*., 1996)
e) Seeds: The seeds are oval in outline, apically rounded, basally pointed, flattened in cross section, light brown, and have a surface distinctly transversely ridged. *Oxalis corniculata* will have stolons. (David *et al*., 1996)



Various parts of Oxalis corniculata Linn.

Vernacular Names (Hemant *et al*., 2011)

Sanskrit: Ambashta, Amlalonika, Amlapatrika, Amlika, Amlotaja, Cangeri
Hindi: Seh-patti, Tinpatiya, Anboti, Chuka tripati, Bhilmori, Khatari
English: Indian sorrel
Bengali: Amrul-sak, Amrul shak, Amrul, Tandi chatom arak, Amrool

Phytochemical Constituent

Oxalis corniculata have a wide ranges of phytochemical constituents have been isolated from the plant like flavanoids, tannins, phytosterols, phenol, glycoseides, fatty acids, galacto-glycerolipid and volatile oil. The leaves contain flavonoids, iso vitexine and vitexine-2"- O- beta – D- glucopyrunoside. It is rich source of essential fatty acids like palmitic acid, oleic, linoleic, linolenic and stearic acids. (Badwaik *et al*., 2011)

MATERIALS AND METHODS

Collection of the sample

Oxalis corniculata leaves were collected from the adjacent garden of Department of Home science campus, University of Calcutta.

Preparation of sample

The fresh leaves were selected as the test portion for the quantitative estimation of the minerals.

Preparation of working solution

The working solution was prepared for measuring the following minerals Ca, Cu, Fe, Mg, Pb, Mg, P, Zn using AOAC method. (Dr. Horwitz *et al*., 2006) The instrument used for mineral estimation was ICP (OES), model ICAP6800, serial number ICP 20073108, calibrated with NIST certified multi-standards.

RESULTS

Minerals	mg/ 100 gm of fresh leaves
Calcium	207.9
Chromium	ND(DL – 0.5mg/1000g)
Copper	0.225
Iron	14.929
Magnesium	77.64
Lead	0.151
Selenium	ND
Phosphorus	0.06
Zinc	2.043
Cadmium	ND(DL – 0.1mg/1000g)

ND- No detected DL- Detection limit

From the study it can be concluded that *Oxalis corniculata* is a valuable plant having numerous benefits. The study revealed that amrul leaves are rich source of minerals like calcium, iron, magnesium and zinc and the content is higher compared to some commonly edible leafy vegetables and the leaves also contain considerable amount of copper, lead and phosphorus although another important antioxidant mineral selenium was not detected in the leaves.

DISCUSSION

Previous studies revealed that *O. corniculata* has high nutritive value and therapeutic benefits. Though edible but being unfamiliar it is neglected. Even though self sufficiency in food production has been achieved in our country, the population still lacks access to balanced food. Poverty and lack of purchasing power have been identified as two major factors responsible for low dietary intake. Therefore *O. corniculata Linn*. may be used as a supplementary food source because it has high nutritive value, easily available, cheap, does not require special care for farming and has medicinal properties to prevent various diseases. On the other hand, suffering from diseases is an unbearable burden on the society. Use of traditional medicine is considered as cost effective, safe, and affordable and has acceptability among the population. It may be stated that this research work has a social contribution also. It should be promoted as a cheap food source with high nutritive value and therapeutic benefits in a poor country like India to improve the nutritional and health scenario.

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