

## Nutritive Aspects of *Oxalis corniculata* L. Used by Tribals of Central India During Scarcity of Food.

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**Abstract:** Reports on ethnobotanical surveys reveal that a good number of plant species are being used by various tribal communities as emergency food. The present work deals with some parameters regarding nutritive value of leaves of *Oxalis corniculata*. L. used as alternative vegetable during emergency by some tribes of central India. The leaves have been found to be rich in moisture (82.42±0.5%), total carbohydrate (24.67±0.4%), crude protein (22.28±0.5%), crude lipid (23.7±0.5%), sodium (1.12±0.02%), potassium (2.17± 0.31%), calcium (2.5± 0.08%), nitrogen (3.56±0.70 %) and magnesium (0.25±0.03%). [Journal of American Science 2010;6(11):435-437]. (ISSN: 1545-1003).

**Key words:** Nutritive status;*Oxalis corniculata*; Tribes; Scarcity of food.

### 1. Introduction

Analysis of the work done all over the world on survey among aboriginal societies, and scrutiny of ethnobotanical literature had brought about the record of several hundred wild edible plants, which not only satisfy hunger of the people but have been proved nutritious too. It has been noticed that several tribal communities, who still live in undisturbed forest areas possess the traditional food habit. This probably emphasizes on sound nutritional status of wild edible plants, consumed by tribals as regular food or supplementary food. Seeds of certain indigenous species rich in protein are more or less equal to that of almonds (Oommachan and Masih, 1998). It was observed that during adverse conditions when food is not available due to drought, flood or other calamities, these tribes go for consuming other herbal edibles. The nutritional composition of a large number of Plants used in emergency by various tribes in different parts of the world has been evaluated. Kundaji and Rao (1954), Barrau (1959), Mai *et al.*, (1960), Rajaram and Janardranan (1991), Vadivel and Janardranan (2000), Lockeett *et al.*, (2000), Ogle *et al.*, (2001), Rehman *et al.* (2006). Madhya Pradesh is a tribal rich

state where a large number of tribal communities are living in various forest pockets. Reports on ethnobotanical surveys reveal that tribal communities use a good number of plant species as emergency food. Patole and Jain (2002) enumerated nearly 45 plant species consumed by tribals and other rural people residing in Pachmarhi Biosphere Reserve of Madhya Pradesh. It includes the species of *Bauhinia*, *Cassia*, *Phoenix*, *Ficus*, *Polygonum*, *Rhus*, *Amaranthus*, *Oxalis* etc. Nutritional value of several such species has now been estimated and their consumption seems to be beneficial to tribals. The present work deals with analysis of nutritive value of leaves of *Oxalis corniculata*.L, consumed during emergency by some tribal communities of central India.

*Oxalis corniculata* L. commonly known as Amboti, Indian sorrel, (Family Oxalidaceae) is a herb with creeping stem, rooting at nodes. Leaves long petioled, Leaflets with white hairs on margins and lower portion of the middle vein, petioles pubescent 2-4 cm long. Its leaves serve as the major means of food for the tribals during emergency since long back, and proven to save the life of tribals during severe famine and extreme scarcity. The leaves of the plant are eaten both raw as salad and cooked. Leaves

are also used for making sandwiches; chutney pickles and is considered as cooking refrigerant by the Sahariya tribe of central India. Its leaves are used to cure fever, piles, Scurvy and dysentery (Kirtikar and Basu, 1975).

## 2. Material and Methods

The plant material of *Oxalis corniculata* was collected from various tribal inhabited forest localities of central India and identified with the help of floras, authentic literature and herbarium of School of Studies in Botany, Jiwaji University Gwalior (M.P). The parts of plants, used by tribals for edible purposes were analyzed for the estimation of various components. Moisture content, crude protein, total carbohydrates, crude lipids were estimated following the standard methods (AOAC 1990). Total nitrogen was estimated by modified Kjeldahl method (Iswaran and Marwaha 1980).

### Estimation of Potassium, Sodium and Calcium (Flame photometer method)

One gm of powdered plant material was taken in a conical flask and digested in tri acid mixture i.e. Sulphuric acid ( $H_2SO_4$ ), Nitric acid ( $HNO_3$ ) and Per Chloric acid ( $HClO_4$ ) in the ratio of 9:3:1. The white colourless digested material was filtered and was made up to 100 ml by adding distilled water, 10 ml of aliquot was taken and diluted to 25 ml with distilled water and analyzed on digital Flame Photometer by using filters of potassium, sodium and calcium separately.

### Estimation of Magnesium (Flame atomization technique)

One gm of crushed powdered plant sample was kept in 15 ml hot water for infusion for 1 hr, then 10 ml Per Chloric acid ( $HClO_4$ ) and Nitric acid ( $HNO_3$ ) in 1:4 ratio were added to sample to dissolve the Magnesium present in the plant material. The sample was filtered and made up to 50ml by adding distilled water to the filtrate and aspirated by atomic absorption spectrophotometer model 2380 P.E. USA. Under condition of current operating maxima 15 Am, Lamp Mg, bulb Parkin Elmer. Readings were taken at 285.4 nm.

## 3. Results

Nutritional composition of leaves of *Oxalis corniculata* (Table -1) shows that it contains high moisture content ( $82.42 \pm 0.5\%$ ), which is in conformity with earlier reported range of 81.4 - 90.3% in some Nigerian green leafy vegetables (Ifon and Bassir 1980).

**Table.1: Nutritional composition (per 100g dry sample) of *O. corniculata* leaves**

Nutritional component	Concentration %
Moisture	$82.42 \pm 0.5$
Carbohydrates	$24.67 \pm 0.4$
Crude proteins	$22.28 \pm 0.5$
Crude Lipids	$23.75 \pm 0.5$
Sodium	$1.12 \pm 0.02$
Potassium	$2.17 \pm 0.31$
Calcium	$2.5 \pm 0.08$
Nitrogen	$3.56 \pm 0.70$
Magnesium	$0.25 \pm 0.03$

The data comprise the mean value  $\pm$  SD of three replicates

The crude protein content in leaves of *Oxalis corniculata* ( $28\% \pm 0.5$ ) was found more than *Ipomoea aquaticus* leaves i.e. 17.84% (Vishwakarma and Dubey 2009). The crude lipid content ( $23.75 \pm 0.5\%$ ) was observed more in comparison to the previously reported values 13.4-17.6% in non-conventional leafy vegetables in Maharashtra (Kulkarni et al., 2003). The carbohydrate Content was found to be ( $24.67 \pm 0.4\%$ ), which is less in comparison to *Ipomoea batatas* leaves 82.85% and *Corchorus tridens* 75.00% (Asibey et al., 1999). The leaves of *Oxalis corniculata* exhibit rich in mineral contents like Sodium ( $1.12 \pm 0.02\%$ ), Potassium ( $2.17 \pm 0.31\%$ ), Calcium ( $2.5 \pm 0.08\%$ ), Nitrogen ( $3.56 \pm 0.70\%$ ) and Magnesium ( $0.25 \pm 0.03\%$ ), these mineral components are vital in regulating various metabolic pathways in human body. Thus observations indicate that consuming *oxalis corniculata* during scarcity of food probes to be neutracentric. The species grow in wild thus can be collected easily. Tribals also store its dried parts so that it can be consumed at any time. Mineral composition of leaves also indicates that all required mineral

## 4. Discussions

The present study indicates that the leaves of *Oxalis corniculata* are rich from nutritional point of view and can be used as supplementary food source to deal with the problems of limited food production in the tribal areas during emergency. As such there is a treasure of knowledge with the various tribal communities of world regarding the multifarious use of wild plants. There are several other wild plant

species used by the tribal which are edible and easily accessible during adverse conditions like drought, famine etc. Some such species of Central India are *Rhus parviflora*, *Achyranthes aspera*, *Amaranthus viridis* and *Boerhavia diffusa*. When such wild species are accepted by the people as edibles like other cultivated ones they can play an important role in solving the various food problems world over.

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