

Purslane (*Portulaca Oleracea*): A Prospective plant Source of Nutrition and its waste utilization in traditional product

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Abstract

The purpose of this review is to study powder leaves of purslane (*Portulaca oleracea*). It is one of India's most widely cultivated and popular vegetable. Purslane (*P. oleracea*) leaves is rich in β -carotene, iron, and calcium source. This leaves categories as waste products, however, can be used for the treatment of anemia and people with micronutrient inadequacies in value-added products. This analysis evaluated the nutritional profile of powder and its use in purslane leaves. For drying leaves at different temperatures for a particular period there are a variety of drying methods, such as dryers for hot oven and sun drying methods. It can be stored in the lean season after drying. They are also rich in beneficial plant metabolites, including sulphur that contains glucosinolates, anthocyanin, flavonoids, and other compounds for improving nutrient, physical-chemical, sensorial and health benefits. Purslane leaves phytochemicals are more powerful antioxidants that can reduce the risk of chronic diseases by protecting against free radicals.

Keywords: *Purslane* (*Portulaca oleracea*), *Traditional products*, *Nutritional quality*, *Omega-3 fatty acid*.



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INTRODUCTION

In the present scenario, people consume plant substances not only for the satisfaction of hunger or to fulfill the nutrients requirement to maintain the body processes but also to obtain those substances which help to improve their health by reducing the risk of disease. Green leafy vegetables (GLV) have been the mainstay of human diet as a source of micronutrients and gives an important contribution in combating micronutrient malnutrition in addition of food security as compared to conventional cultivated other vegetables [5]. GLV on a regular basis can replace or reduce the use of expensive medicines and supplements to maintain the health of individuals.

India belongs to one of the richest vegetations of the world as India has a wide range of climate condition and environment. Thousands of plants were recorded and used for the treatment of various syndromes in India since ancient time. Knowledge of the medicinal and nutritive value of plants is limited. Since time immemorial, human beings have been in search of a plant with therapeutic potentials. Folk medicines always play a key role in the treatment for different diseases in rural and tribal areas. Today's modern health science also has shown interest in these plants due to their safe, effective, and inexpensive that would be a future remedy for the treatment of various types of diseases.

In this consideration, Kulfa is a wise selection due to its soaring nutritive report for human as a food substance with medicinal potential. This herbaceous succulent annual plant can be found

all over the world in the managed and temperate area and is approved as herb in several regions of Europe, Asia, Mediterranean region. The botanical name of Kulfa is *Portulaca oleracea*. It belongs to the Portulacaceae family and is one of the imperative green leafy vegetables which serves as a single remedy for all health problems. In this regard 'Global Panacea' term has been given by the World Health Organization [4]. The presence of phytochemicals in *P. oleracea* contributes to protective health effects in human being. It encompasses superior nutrition worth than other vegetables because of its omega-3 fatty acid, beta carotene, ascorbic acid, and alfa tocopherol. Rich source of omega-3 fatty acid is helpful in prevention of heart diseases and boosting the immune system [22].

Some researchers reported that the high oxalate content in Purslane leaves may develop kidney stones [7]. Appropriate processing techniques can reduce oxalate up to a safe limit in food stuffs. *P. oleracea* leaves are seasonal and highly perishable and it is very susceptible to microbial spoilage. Therefore, there is a need to preserve them to retain nutrients through convenient processing technique. Drying and blanching are the most convenient and easy methods for preservation of *P. oleracea*, especially when they are abundantly available, and it can be the precious sources of nutrients throughout the year especially for rural folks. It can be used as a supplement of minerals, vitamins, fibers, proteins, and other nutrients which are generally present in limited amount in regular diet. Therefore, the present study will be undertaken to explore possibilities of using the leaves of *P. oleracea* to enrich the various traditional food items to cure deficiency disease.

LITERATURE REVIEW

Characterization of the *P. oleracea*

P. oleracea is a succulent annual plant that grows in a variety of places due to its ability to thrive in poor soil. It can be consumed as a cooked vegetable and can be used as sprinkler on salads, soups, sprinkles, or any foods you want. It is also antibacterial, antiscorbutic, depurative, diuretic, and febrifuge. The leaves are high in omega-3 fatty acids, which help to prevent cardiac attacks and immune system strengthening.

Traditional snack products

It grows well in olive groves, vineyards, cultivated land, landscape, gardens, highways, and other troubled areas. A snack is a bigger portion of food than a regular meal that is traditionally consumed between meals. Traditional food is a cuisine which already been passed through generations [11]. It has a famous pattern in a national dish, and regional cuisine that rich in calories and can cooperate with the changing disease patterns. Some traditional foods such as chakali, potato chips, bhujiyashev, and crackers can be homemade, in restaurants, or even small level and largescale industries [26].

Nutritional composition of *P. oleracea* leaves

Recent studies indicate that *P. oleracea* has higher nutritional worth as compared to other conventional vegetables, with higher beta carotene and alpha-linolenic acid [8]. Alpha-linolenic is an omega-3 fatty acid which plays a significant role in human growth of various types of chronic diseases [12]. The high oxalate substances in *P. oleracea* leaves and other acceptability constraints become the roadblocks responsible for its consumption, so appropriate processing techniques

should be applied as necessary step to augment its role of nourishing and it is therapeutic agent for the benefit of masses [8]. Due to its high nutritional and high antioxidants properties, it will become a powerful food of the future. *P. oleracea* is a promising underexploited GLV and it can emerge as a nutritious and remedial agent. Food processing is the technique used to convert raw foods into a proper cooked and preserved food, with changes in flavor, texture, appearance and bioavailability of the bioactive compound as well as nutrient concentration. The positive and the negative effects depend on the type of processing techniques used. *P. oleracea* is a potential source of nutrient and bioactive compound therefore, the ethnobotanical use of the leaf as vegetable in various food preparations should be encouraged which would be beneficial for prevention and treatment of diabetes, hypertension and cardiovascular diseases.

Table 1. *P. oleracea* leaves (Nutritive value per 100 g)

Principle	Nutrient value	Percentage of RDA
Moisture	3.67 g	0.1%
Ash	40.55 g	3.1%
Protein	1.25 g	2%
Crude Fibre	2.1 g	2.1%
Total Fat	0.2 g	0.5%
Carbohydrate	3.4 g	2%
Iron	1.99 mg	25%
Calcium	62 mg	6.5%
Magnesium	68mg	17%
Sodium	42 mg	3%
Potassium	490 mg	10.5%
Phosphorus	41 mg	6%
Zinc	0.17 mg	1.5%

Omega-3 Fatty Acid

P. oleracea is an omega-3 fatty acids source of the greenest plant. It has lower cholesterol, increases the beneficial lipoprotein density and triglyceride levels. In addition, omega-3 fatty acids may be beneficial for the treatment of vascular disease to reduce blood thickness [12]. Purslane also provides a rich source of omega-3 fatty acids without the cholesterol of fish oils, as it does not include cholesterol, in comparison to fish oil with high cholesterol and calorie content. It has a low

prevalence of cancer and cardiac disease, possibly due in part to purslane naturally occurring omega 3 fatty acids [15].

The Beneficial effects of *P. oleracea* leave on human health

P. oleracea is found throughout the old world, from North Africa to the Middle East, the Indian subcontinent, Malaysia, and Australia. It has very important effects in the medicinal field, and it is considered as “medicinal food” to consume like spinach. Purslane is currently considered so much interesting as a food point of view that it is mentions in the category of “World Economic Plants”. It is also frequently mentioned in the alternative system of medicine. Purslane (*P. oleracea*) reduces body mass index, unsaturated fat levels in the blood, and hyperinsulinemia. It also enhanced insulin sensitivity and lipid metabolism in diabetes mellitus rats after Streptozotocin (25mg/kg) injection and for age feeding with high calorie content, indicating that Purslane reduces insulin opposition.

Purslane leaves powder raises high density lipoprotein cholesterol levels while reducing serum total cholesterol, low density lipoprotein cholesterol, alkaline phosphatase, aspartate overall and direct triglycerides fasting and postprandial glucose level, and BMI in type 2 diabetic subjects. Purslane aqueous extract prevents diabetic vascular inflammation, hyperglycemia, and diabetic endothelial dysfunction in type 2 diabetic db/db mice, so it indicated protective function against diabetes and vascular compounds related it. Moreover, crude polysaccharide extract from plant of purslane exhibits the property of lowers blood glucose and modulates the glucose and lipid metabolism in alloxan induced diabetic mice.

P. oleracea Leaves are very effective to build up insulin response and recover impaired blood glucose tolerance [18]. In type 2 diabetic mice, the aqueous extract of Purslane reduces diabetic Inflammation of the vessels hyperglycemia, and insulin resistance [20] and diabetic endothelial dysfunction, indicating a role in diabetes prevention and associated vascular complications [3]. Report also indicated that it was helpful in maintaining blood glucose level in alloxan-induces diabetic rats. Purslane has the hypoglycemic potential and can be helpful on the diabetic treatment [24]. Purslane supplementation has capable implication for improving glycemic status and lipid concentration in the blood especially in diabetic subjects [9]. It has been given to alloxan-induces diabetic rats for twentyeight days for treatment purpose as hypolipidemic agent. The results reported that blood glucose and blood lipids were regulated in rats [19]. In Iran folk medicine, roots, leaves and seeds of Purslane have been recommended for treatment of diabetes mellitus.

Coronary diseases are of the most important and common diseases of recent years that have been spread in a wide range of advanced and poor societies, in all ages especially in middle age [17]. The main cause of coronary artery disease is atherosclerosis which is now the most frequent reason of death in developed countries. Spread of this disease is specifically attributed to the cholesterol and primarily to the lipid metabolism [16]. Utilization of Purslane for four weeks decreased plasma cholesterol and increased level of high-density lipoprotein-cholesterol level in blood. Plasma triglyceride concentration were not affecting by the utilization of *P. oleracea* supplement [23]. Purslane supplement may have the possible to modify blood lipid digestion system in hypercholesterolemia subjects and reduce the risk of sensitivity infection.

CONCLUSION

P. oleracea leaves are high in dietary fiber, minerals, iron, and beta carotene. Dehydration is one of the most effective methods of preserving green leafy vegetables. Green leafy vegetables, which are high in essential micronutrients, can be used to supplement nutritionally deficient products. *P. oleracea* leaf powder can be used to add value to traditional products in order to overcome health problems and prevent anaemia diseases.

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