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## Qualitative phytochemical screening of leafy vegetable consumed by aborigine of Santal Pargana, Jharkhand

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**Abstract-** Santal Pargana is a home of tribal groups mainly "Santals". They have wider array of traditional leafy vegetable that are cheap source of nutrition as well as medicinal value. The utilized leafy vegetables are rich source of different minerals as well as very high in phytochemicals such as Flavonoids, Saponin, Tannin, Phenolic acid, Glycosides, Terpenes, Anthocyanin, organic acid, Steroids, oils, Alkaloids and Amino acid. In one hand phytochemicals are used as protective measures of plants while on the other hand they give beneficial effect on human health. The aim of research is to determine the qualitative nature of phytochemicals present in leafy vegetables which are utilized by the tribal of Santal Parganas as well as to make aware about the importance of potency of these phytochemicals which are unknown for the aborigine people of Santal Parganas locality. Further it is also the aim to aware the urban people.

**Key words:** Leafy vegetables, Phytochemicals, Aboriginal, Santal Pargana

### INTRODUCTION

In India there are large no of tribal communities living in forest areas who lead simple primitive life form. They are most dependent upon plants, animals and their products which are present in their surroundings. Out of the whole tribal population in Jharkhand, Santal Parganas has mostly Santal tribals. Santal Parganas comprises 6 districts of Jharkhand which lies between 23°40' N and 25°28'N latitude and between 86°28'E and 87°57'E longitude. The region extends over 5470 square miles. Profile of the people in Santal Parganas as the study area is interesting as this tract of Jharkhand is ethnographically rich with the aboriginal and the migrants.

Rice is the main cereal food and the communities depends a lot on the wild vegetables, fruits, flowers, tubers and rhizomes that grow profusely on their own without any inputs. The study area is very rich with respect to the diversity of green leafy vegetables that are cultivated and is collected from wild.

The leafy vegetables most often come out from short lived herbaceous plants, whereas leaves of some woody plants are also eaten by local people. They collected these from agricultural field, non-agricultural field as well as from forest land to supplement their staple food. The availability of leafy vegetables totally depends upon seasons. Besides their dietary need they also sale leafy vegetables in nearby markets.

These local leafy vegetables are rich source in nutrient, minerals and phytochemical active molecules.

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Leafy vegetables contain number of phytochemicals which helps to protect them from free radicals and reduce oxidative stress. The phytochemicals which are found in these leafy vegetables are mainly Flavonoids, Saponin, Tannin, Phenolic acid, Glycosides, Terpenes, Anthocyanin, Organic acids, Steroids, Oils, Alkaloids, Amino acids etc. The phytochemical analysis thus collected by different researchers help in finding the potential of leafy vegetable which are by aboriginals without knowing their potential.

Several studies have been carried out on ethno-medicine, Ethnobotany and on wild edible of the indigenous and tribal population of this region by different investigators like Verma *et al.* (1986)<sup>1</sup>, Sinha and Ranjan (2006)<sup>2</sup>, Das (2007)<sup>3</sup>, Kumar and Abbas (2012)<sup>4</sup>, Das and Mukherjee (2012)<sup>5</sup>, Das and Bondya (2016)<sup>6</sup>, Kumar (2014)<sup>7</sup>, Bondya *et al.* (2015)<sup>8</sup> in the recent past but qualitative phytochemical screening of leafy vegetable studies have been carried out measures of the area.

## **MATERIALS AND METHOD**

Intensive & were conducted in the study area during June to September 2020 in different region of Santal Pargana such as Dumka, Pakur, Kathikhund, Udhwa, Shikari Pará, Raneshwar, Masaliya, and nearby villages where tribal reside. Voucher specimens and ethnomedicinal information were collected following the methods described by Jain (1965)<sup>9</sup> and Jain & Rao (1976)<sup>10</sup>. The tribal hamlets and forest pockets were first visited to collect a broad range of information about the different types of leafy vegetables used by the tribal community. The information was gathered and views or knowledge about the traditional and medicinal properties of leafy vegetables which are being consumed by them were recorded. Plant's specimens were collected with the informant from home gardens, cultivated land, forests and local markets. Plants were identified with the help of available flora and their vernacular names were verified. Haines (1961)<sup>11</sup>, Hembrom (1991)<sup>12</sup>, Jain (1991)<sup>13</sup>.

## **RESULTS**

After collecting the data about leafy vegetables which are regularly consumed by aboriginals, we collected the data of their phytochemical nature through different works done by different researchers. The natures of these phytochemicals are:

**Flavonoids:** These are the major groups of compounds that are found in 23 plants out of 32 plants. It acts as antioxidant and has multiple biological activities including Vasodilator, antibacterial, immune stimulating, anti-allergic & antiviral.

**Saponin & Alkaloids:** These are the 2<sup>nd</sup> major phytochemical constituent among 32 plants. Saponin decreases blood lipids, and lower blood glucose. Alkaloids are used for reducing headache and fever. They are attributed for anti-bacterial and analgesic properties. The plant species use alkaloids to protect themselves against herbivores. They could also be used as a natural source of insecticides and fungicides.

**Tannin and Phenolic acid:** These are 3<sup>rd</sup> major phytochemicals. Tannin contains anti diabetic properties, astringent in nature and is used for intestinal disorder. The phenolic compounds are most ubiquitous group of plant metabolites appeared to possessed biological properties such as anti-apoptosis, anti-aging, anti-carcinogen, Cardiovascular and protective in nature.

**Terpenes, Glycosides & Steroids:** These are next mostly found phytochemicals in leafy vegetables. Terpenoids molecules have anti-cancer properties. It has also therapeutic properties including anti- parasitic, anti-microbial, anti-allergic, anti-spasmodic, anti-hyperglycemic, anti-inflammatory and immunomodulatory properties. Steroids have been reported to have anti-bacterial properties and they are very important compound especially due to relationship with compounds such as sex hormone. Glycosides are naturally cardio active drugs used in the treatments of congestive heart failure they have potent in curing cardiac in sufficient cough and circulatory problems.

**Amino Acids and Oils:** These phytochemicals are found in few leafy vegetables. It helps in the treatment of imbalance of brain metabolism and neurotransmission. Oils provide flavor and has pharmaceutical and cosmetic properties.

## **DISCUSSION**

Around 32 leafy vegetable plant species have been collected which are frequently used by tribal communities. The screening and study of 32 different plant specimens belonging to different families for phytochemical constituents such are Flavonoids, Saponins, Tannins,

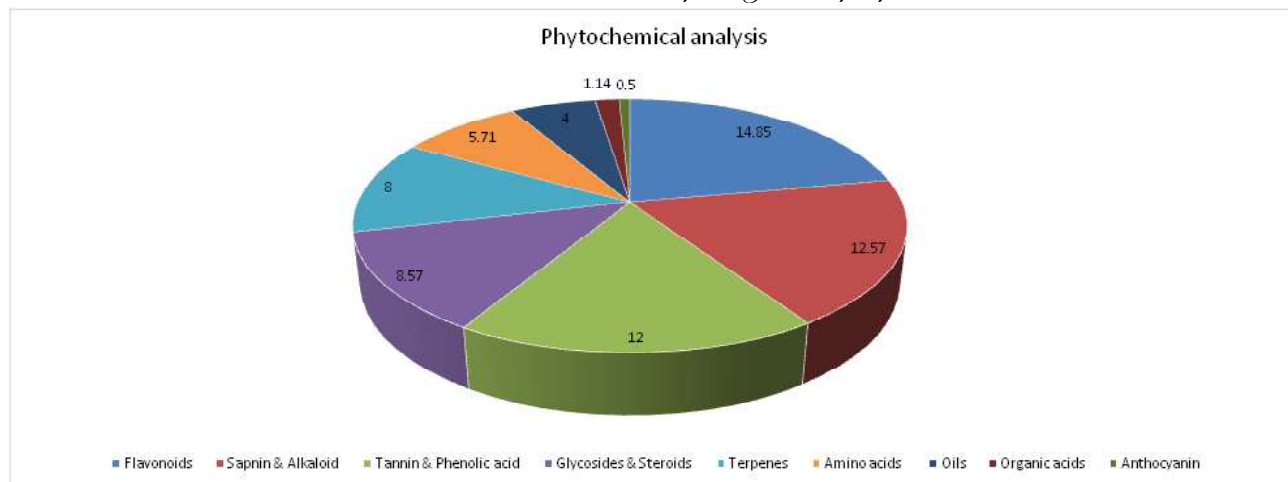
Phenolic acid, Glycosides, Terpenes, Anthocyanin, Organic acid, Steroids, Oils, Alkaloids and amino acid. The distribution of these constituent in the plant specimens were assessed and compared. A 32 plant specimens Flavonoids, Saponins, Tannins, Phenolic acid and Alkaloids are major phytochemical constituents of these plants. Glycosides, Terpenes, Steroids and Amino acids

are found as 2<sup>nd</sup> major phytochemicals in 15 plants. Anthocyanin have been found in 1 plant while Organic acid and Oils are found in 2 and 7 plants respectively.

The maximum leafy vegetables belong to family Amaranthaceae, Lamiaceae, Fabaceae, and Cleomaceae. The 12 types of phytochemicals in these leafy vegetables show the nutritional and medicinal properties.

**Table 1: Phytochemical Analysis of leafy vegetables**

Sl.No.	Name of leafy vegetables	Santali Name	Family	Flavonoids	Saponin	Tannin	Phenolic Acid	Glycosides	Terpenes	Anthocyanin	Organic acid	Steroids	Oils	Alkaloids	Amino Acid
1	<i>Aerva lanata</i> (L.) Juss.	Lopong arak	Amaranthaceae	+	+	+	-	-	+	-	-	-	-	+	-
2	<i>Alternanthera sessilis</i> Br.	Garundi arak	Amaranthaceae	+	+	+	+	-	+	-	-	+	-	+	+
3	<i>Amaranthus dubius</i>	Gandhari	Amaranthaceae	+	-	-	+	-	-	+	-	-	-	+	-
4	<i>Amaranthus gangeticum</i> Roxb.	Lal Gandhari	Amaranthaceae	+	+	+	+	+	-	-	-	-	-	+	-
5	<i>Amaranthus spinosus</i> Linn.	KanteliChaulai	Amaranthaceae	-	-	-	-	+	+	-	-	-	-	+	-
6	<i>Amaranthus viridis</i> Linn.	Lotia arak	Amaranthaceae	-	+	+	+	+	-	-	-	-	-	+	+
7	<i>Antidesma diandrum</i> Roxb.	Matha arak	Euphorbiaceae	+	+	+	+	-	-	-	-	-	+	-	+
8	<i>Basella alba</i> L.	Purai arak	Basellaceae	+	+	-	-	-	-	-	+	-	+	-	+
9	<i>Bauhinia purpurea</i> L.	Sing arak	Fabaceae	+	+	+	+	+	-	-	-	+	+	+	+
10	<i>Boerhavia diffusa</i> L.	Khapra arak	Nyctaginaceae	+	+	+	+	+	-	-	-	-	-	+	-
11	<i>Celosia argentea</i> L.	Sirgiti arak	Amaranthaceae	+	+	+	+	+	-	-	-	-	-	+	-
12	<i>Centella asiatica</i> Linn.	Beng arak	Apiaceae	+	+	+	-	+	+	-	-	+	-	+	-
13	<i>Chenopodium album</i> Linn.	Bathua arak	Amaranthaceae	+	+	-	+	-	-	-	-	-	-	+	-
14	<i>Cleome gynandra</i> L.	Hurharia arak	Cleomaceae	+	+	+	-	-	+	-	-	+	-	-	-
15	<i>Cleome viscosa</i> L.	Setakata arak	Cleomaceae	+	+	+	+	+	+	-	+	+	+	-	+
16	<i>Colocasia esculenta</i> L.	Saru arak	Araceae	+	+	+	+	+	+	-	-	+	-	+	-
17	<i>Commelina benghalensis</i> L.	Kana arak	Commelinaceae	+	+	+	-	-	-	-	-	-	+	-	-
18	<i>Cordia dichotom</i>	Buj arak	Boraginaceae	+	+	-	+	+	-	-	-	+	-	+	-
19	<i>Enhydra fluctuans</i> Lour	Hencha arak	Asteraceae	+	+	+	+	-	+	-	-	-	-	-	+
20	<i>Ficus geniculata</i> Kurz	Putkal arak	Moraceae	-	+	+	-	-	-	-	-	-	-	-	-
21	<i>Hygrophila auriculata</i>	Dangrakanta	Acanthaceae	+	-	-	+	+	+	-	-	+	-	-	+
22	<i>Ipomoea aquatica</i>	Kalmi arak	Convolvulaceae	-	+	+	+	+	-	-	-	+	-	+	-
23	<i>Leucas aspera</i> Spreng.	Guma	Lamiaceae	-	-	-	+	+	+	-	-	+	-	+	+
24	<i>Leucas cephalotes</i> Spreng.	Dhurup arak	Lamiaceae	-	-	+	+	-	+	-	-	+	+	+	-
25	<i>Marsilea minuta</i> L.	Chatom arak	Marsileaceae	+	-	+	+	-	+	-	-	-	-	+	+
26	<i>Melochia corchorifolia</i> L.	Thuya arak	Malvaceae		-	-	-	+	-	-	-	+	-	+	-
27	<i>Oxalis corniculata</i> Linn.	Tandichatom	Oxalidaceae	+	-	+	+	-	-	-	-	+	+	-	-
28	<i>Polygonum plebeium</i> R.Br.	Chimti arak	Polygonaceae	+	-	-	+	-	-	-	-	-	-	-	-
29	<i>Portulaca oleraceae</i> Linn.	Ulinalan arak	Portulacaceae	+	+	-	-	+	+	-	-	+	-	+	-
30	<i>Senna tora</i> L.	Chakaunda arak	Fabaceae	+	+	+	-	-	-	-	-	-	-	+	-
31	<i>Talinum paniculatum</i>	Dakhin arak	Talinaceae	+	+	+	-	-	-	-	-	+	-	+	-
32	<i>Vangueria spinosa</i> Roxb.	Makra arak	Rubiaceae	+	-	-	-	-	+	-	-	-	-	+	-



**Fig.1- Percentage analysis of phytochemicals in leafy vegetables**

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