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Documentation of edible oil yielding plants of Shivamogga taluk of Karnataka

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Abstract

The present study carried out with a preliminary documentary survey of edible oil yielding plants in and around Shivamogga taluk area of Karnataka during 2020-21. During this study, a total of 31 edible oil bearing plants belonging to 30 genera and 20 families were recorded. The scientific names of the plants with their family names have been reported in the current study. Among families Arecaceae dominant with 05 species followed by Cucurbitaceae with 3 species preceded by Fabaceae, Brassicaceae, Malvaceae, Poaceae and Apiaceae with 2 species each respectively. The importance of few edible oil bearing plants are discussed in this paper. Good quality cultivation practices are needed to preserve and receiving maximum yield which can be used as alternative for their livelihood.

Key words : Edible oil yielding plants, Shivamogga taluk.

Edible plant oils are used in food, both in cooking and as food supplements. The oil obtains from such plant seeds is used for the manufacture of hair oil, soaps, refined cooking oils, candles, paints, varnishes, skin care creams, biofuel, lighting etc. Some of the edible oil seed bearing plants include *Cocos nucifera, Arachis hypogea* and *Zea mays* etc.

Seeds pave the way for farm efficiency and utility, making a fundamental and essential contribution to effective yield production. The resulting oil is used either for edible or medicinal and cooking purposes. Oil crops have recently received increasing attention due to the increasing demand for vegetable oils, animal feed, pharmaceutical biofuels, and other chemical industries.

Oilseeds are one of the most important crops in India. For plants, they are essential as energy stores to sustain seed germination. These are considered a viable food energy source for humans. The synthetic composition of cultivated and wild seeds is well known as they constitute a large part of the food supply and industrial raw materials. There is relatively little information on wild seeds. However, the

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search for new resources as industrial raw materials is gradually providing information on wild plant seeds. Seed chemistry is an interesting topic for scientific research, resulting in much information being collected on both cultivated and wild species[3,7].

The aim of the present study is to know the diversity of edible oil yielding plants occurring in and around Shivamogga taluk area of Karnataka. Hence, the present study has been carried out and it is helpful for further scientific research.

Study area :

Shivamogga district is part of the Malnad region of Karnataka. The district is surrounded by Haveri, Davanagere, Chikmagalur, Udupi and Uttara Kannada districts. The district ranks 9th among the districts of Karnataka in terms of total area. The area is 8465 km^2 Shivamogga is located between latitudes 13°27' and 14°39'N and longitudes 74°38' and 76°04'E, with an average altitude of 640 meters above sea level. At an altitude of 1343 meters, the peak of Kodachadri Hill is the highest point in the district. Kali, Gangavati, Sharavati and Tadadi rivers originate from this district. The two major rivers flowing through the district are the Tunga and the Bhadra, which meet at Kuduli near the town of Shivamogga, giving it the name Tungabhadra, which later joins the Krishna river.

Collection of data :

Field explorations was conducted during 2020-21 to study the diversity of edible oil yielding plants occurring in Shivamogga taluk of Karnataka. The study was based on

Figure 1. Study area map

extensive and intensive field surveys undertaken and the areas include. Santhekadur, Harige, Voddinakoppa, Vinayaka nagar, Kachinakatte, By pass road, Vidya Nagara, Bapuji Nagar, Nursery farms, Agricultural land during the period November 2020- October 2021. Wastelands, road side fields, remote agricultural areas and house gardens were surveyed in the present study. The plant specimens have been studied and identified by using floras Hooker[7]; Gamble[5]; Rao and Razi[11]; Sharma *et al.*,[13,14]; Saldanha[11,12]; Keshava Murthy and Yoganarasimhan[8], besides other new books and monographs.

Table-1 depicts the checklist of edible oil yielding plants of Shivamogg taluk. A total of 31 species belonging to 30 genera and 20 families were recorded. Among families Arecaceae with 05 species followed by Cucurbitaceae with 3 species preceeded by Fabaceae, Brassicaceae, Malvaceae, Poaceae and Apiaceae with 2 species each respectively. As per Figure 3 *Cocos nucifera, Areca catechu, Carica papaya* and *Coriandrum sativum* show highest percentage of occurrence.

Coconut oil, is an edible oil extracted from the kernel or meat of mature coconuts harvested from the coconut palm (*Cocos nucifera*). It has various applications. Because of its high saturated fat content, it is slow to oxidize and, thus, resistant to rancidification, lasting up to six months at 24 °C (75 °F) without spoiling ("Coconut oil". Transport Information Service,[3] German Insurance Association, Berlin. 2015; https://en.wikipedia.org).

Arachis hypogea oil gives a pleasant tasting for human consumption and also used for cooking. As a legume, *Arachis hypogea* belongs to the botanical family Fabaceae (also known as Leguminosae, and commonly known as the bean or pea family) (The Plant List: A Working List of All Plant Species, 2013). Like most other legumes, peanuts harbor symbiotic nitrogen-fixing bacteria in root nodules (Legumes of The World-Royal Botanic Gardens, Kew. www.kew.org., 2015; https://en.wikipedia.org/wiki/Peanut). This capacity to fix nitrogen means peanuts require less nitrogen-containing fertilizer and improve soil fertility, making them valuable in crop rotations.

Arachis hypogaea, a native to Brazil, is an important source of oil. It is a low growing herb of tropical and sub-tropical regions. The crop is largely grown in Andhra Pradesh, Gujarat, Tamil Nadu, Karnataka, Uttar Pradesh, Madhya Pradesh, Punjab and Rajasthan. The oil is expressed from seeds both by hydraulic presses and expellers. Oil content of seeds varies from 40 to 50%. It is also rich in phosphorus and vitamins. Oil contains mainly oleic acid. It is predominantly used for culinary purposes. It is used for the manufacture of vegetable ghee by hydrogenation. The oil is used as a laxative and emollient. It is also used in soap making, in leather dressings, furniture creams and in making shaving creams, cold creams, candles *etc*. The oil cakes are used as feed for animals and as a manure.

Zea Mays (maize) is an important source of starch. Corn starch is an important ingredient in home cooking and many industrial foods. Corn is also a major source of edible oil (corn oil) and corn gluten. Cornstarch can be hydrolyzed and treated with enzymes to produce syrups, especially high fructose corn syrup, which is a sweetener. It is also fermented and distilled to produce grain alcohol. Corn alcohol is traditionally the raw material for whiskey. Corn is sometimes used as a starch source for beer. Corn is primarily grown to feed livestock as feed, silage (made by fermenting chopped green corn stalks), or grain. Cornmeal is also an important ingredient in some commercial pet food products, such as dog food (https://en.wikipedia.org).

Punica granatum are used in cooking, baking, meal garnishes, juice blends, smoothies, and alcoholic beverages, such as cocktails and wine. *Punica* seed oil contains punicic acid (65.3%), palmitic acid (4.8%), stearic acid (2.3%), oleic acid (6.3%), and linoleic acid (6.6%) (Antioxidant and eicosanoid enzyme inhibition properties of pomegranate seed oil and fermented juice flavonoids.

Brassica campestris is a herb grown as an oilseed crop mainly in the states of Uttar Pradesh, Punjab, Bihar and Assam. Oil content is 32-40%. Erucic acid is the characteristic fatty acid of mustard oil. Oil is obtained by pressing or by solvent. Oil is used for cooking and burning. In Ayurvedic medicine, it is also

used as a topical ointment for paralytic diseases and periodontal disease, and for massage. Used for tanning. Oil cake is used as livestock feed and fertilizer[1].

Linum usitatissimum is an annual herb that grows naturally in the Mediterranean region of Southwest Asia. In India, it is mainly cultivated in Madhya Pradesh, Uttar Pradesh, Maharashtra, Rajasthan/Bihar, Karnataka, and West Bengal. The seeds contain 33-43% extracted by both cold and hot pressing. This oil contains linolenic, stearic, palmitic, oleic, and linoleic acids. Used in the production of paints, varnishes, soft soaps and printer inks. Also used in lubricants, greases, and polishes. Crude oil is used as an emollient, expectorant, and diuretic. The oil cake is used as a protein supplement for cattle and as a high-quality fertilizer.

Glycine max is an herb native to Southeast Asia. In India, it is mainly cultivated in states such as Madhya Pradesh, Rajasthan, Chhattisgarh, and Maharashtra. The oil is obtained from the seeds by pressing or by treating the crushed seeds with a small amount of solvent. It mainly contains unsaturated fatty acids (linoleic acid, linolenic acid, and oleic acid). Oil is used for cooking. It is also used in the production of candles, varnishes, greases, paints, pesticides and disinfectants. Oil cake contains high-quality protein and is used as animal feed.

Sesame is an annual plant native to Africa and India. It is the most important oil in India and has been cultivated since ancient times. In India, it is mainly cultivated in the states of Uttar Pradesh, Rajasthan, Madhya Pradesh, Orissa, Maharashtra, Tamil Nadu, and Andhra Pradesh. The seeds contain approximately 50% oil and can be easily extracted using cold pressing. Oil contains approximately 80% unsaturated fatty acids (oleic acid and linoleic acid). Higher quality varieties are almost tasteless and colorless and are used as an alternative to olive oil for cooking and medicinal purposes. Must be added to margarine and other foods. Poor quality products are used as substitutes for soaps, perfumes, rubber, and in some cases as lubricants. Oil is used for anointing the body, as fuel for lamps, and as food. Oil cake is a good quality feed for livestock[16].

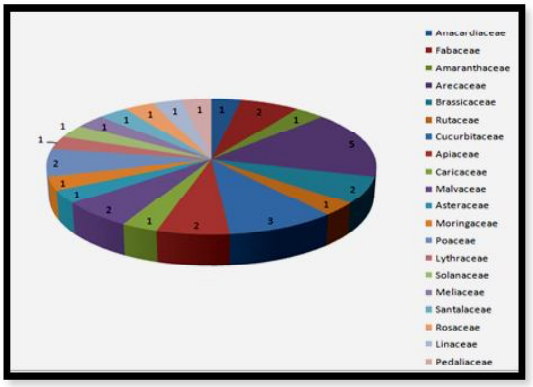

Figure 2. Number of edible oil yielding plants occurring in each family

Helianthus annuus is an important oilseed crop in India. Sunflower seeds contain 42-50% oil. In India, it is mainly cultivated in the states of Karnataka, Maharashtra, Tamil Nadu, and Andhra Pradesh. Oil mainly contains unsaturated fatty acids (oleic acid, linoleic acid). Sunflower oil is an excellent cooking medium. Sunflower oil contains protein and vitamin A and is easily digested. It is also used in the production of paints and soaps.

Table-1. Edible oil yielding plants of Shivamogga taluk, Karnataka

Sl.No	Scientific Name	Family
1.	*Anacardium occidentale* L.	Anacardiaceae
2.	*Arachis hypogea* L.	Fabaceae
3.	*Amaranthus cruentus* L.	Amaranthaceae
4.	*Areca catechu* L.	Arecaceae
5.	*Brassica campestris* L.	Brassicaceae
6.	*Brassica nigra* L.	Brassicaceae
7.	*Cocos nucifera* L.	Arecaceae
8.	*Citrus* sp.	Rutaceae
9.	*Citrullus vulgaris* Schrad	Cucurbitaceae
10.	*Cucurbita* L.	Cucurbitaceae
11.	*Coriandrum sativum* L.	Apiaceae
12.	*Carica papaya* L.	Caricaceae
13.	*Daucus carota* L.	Apiaceae
14.	*Elaeis* sp.	Arecaceae
15.	*Gossypium* sp	Malvaceae
16.	*Helianthus annuus* L.	Asteraceae
17.	*Hibiscus* sp.	Malvaceae
18.	*Momordica charantia* L.	Cucurbitaceae
19.	*Moringa oleifera* Lam.	Moringaceae
20.	*Oryza sativa* L.	Poaceae
21.	*Punica granatum* L.	Lythraceae
22.	*Phoenix* sp.	Arecaceae
23.	*Solanum lycopersicum* L.	Solanaceae
24.	*Zea mays* L.	Poaceae
25.	*Azadirachtha indica* A. Juss.	Meliaceae
26.	*Santalum album* L.	Santalaceae
27.	*Prunus dulcis* (Mill) D.A. webb.	Rosaceae
28.	*Glycine max* (L.) Merr.	Fabaceae
29.	*Linum usitatissimum* L.	Linaceae
30.	*Sesamum indicum* L.	Pedaliaceae
31.	*Elaeis guineensis* Jacq.	Arecaceae

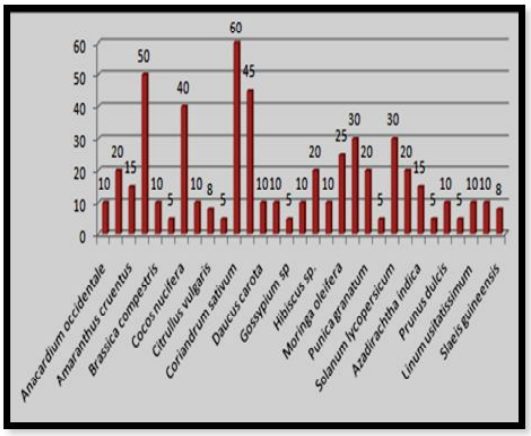

Figure 3. Percentage composition of oil yielding plants in Shivamogga taluk

Edible oil yielding plant seeds have been used as cooking oil and other food supplements. It is believed that the edible oil bearing plant resources of the Shivamogga taluk area provides a checklist of the floristic diversity which will serve as a prepared reference for scientific research.

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