International Journal of Botany Studies
ISSN: 2455-541X; Impact Factor: RJIF 5.12
Received: 31-01-2021; Accepted: 28-02-2021: Published: 02-03-2021
www.botanyjournals.com
Volume 6; Issue 2; 2021; Page No. 15-17

Brief review on edible and non-edible oil yielding plants of Bhadravathi Taluk, Karnataka

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Abstract
The present review study carried out with a documentation of edible and Non-edible oil yielding plants in and around Bhadravathi taluk, Karnataka as worked by various authors in this area. During this study, a total of 22 edible oil bearing plants belonging to 22 genera and 15 families and 27 Non-edible oil seed bearing plants belonging to 23 genera and 17 families were reported. The scientific names of the plants with their family names have been reported in this review. The importance of few Plants are discussed in this review paper.

Keywords: bhadravathi taluk, edible oil yielding plants, non-edible oil bearing plants

Introduction
The use of edible vegetable oils and faunal fats for biodiesel formation has as of late been of extraordinary concern since they rival food materials. The interest for vegetable oils has expanded hugely in present day years, it is difficult to give clarification for the usage of these oils for fuel reason as biodiesel production. Moreover, these oils could be more costly and consequently, the commitment of non-consumable oils will be critical as a non-eatable plant oil hotspot for biodiesel production (Arjun Chhetri *et al*, 2008) [1]. Palatable oils are utilized in cooking, food supplements, hair oil, cleansers, refined cooking oils, candles, paints, stains, healthy skin creams, biofuel, lighting and so forth A portion of the eatable oil seed bearing plants incorporate coconut, ground nut and Zea mays and so forth Non-palatable oil yielding plants can be filled plentifully in wastelands and fields and which, can be considered for biofuel production. A portion of the non-palatable oil seed bearing plants incorporate *Jatropha curcas, Millettia pinnata, Ricinus communis, Cascabela thevetia and Azadirachtha indica* and so forth. Biodiesel in India has arrived at a conclusive stage, and the nation is nearly making a start by presenting a 5% mix of biodiesel with traditional diesel, in any event in chose regions and states. India has immense region of wastelands that isn't being used for development since it is infertile, dry, and saline or alkaline. Most of India's populace lives in towns. The nation has best in class innovations and hightech foundations, and human resources are accessible in plenty. While, the country has accomplished independence in the food area, energy and climate remain zones of worry for rule makers and researchers (Ananth Nag *et al*, 2010) [2].
The aim of this review study is to know the varieties of edible and non-edible oil yielding plants occurring in and around Bhadravathi area of Karnataka as it is helpful for further scientific research.

Materials and Methods
Study area
The Bhadra Project region is situated at latitude 13°42' N and longitude 75°38'20" E and arranged in Malnad area of Karnataka. Bhadravathi town is situated at 13° 52' N scope and 75° 40' E longitude. This zone is arranged a good ways off of around 20 kilometers from the locale central command Shivamogga. It is a modern town of Shivamogga region of Karnataka. Bhadravati is at an elevation of 597 meters (1,959 ft) above ocean level. The taluk outskirts five other taluks, the Shimoga taluk toward the West, the Honnali taluk toward the North, the Channagiri taluk toward the East, the Tarikere taluk toward the South-East, and the Narasimharajapura taluk toward the South-West (Census of India, 2001) [4].

Collection of Secondary data
Data was collected from the published literature as worked by various researchers in the study area.
Analysis of variance and Tukey HSD test for Edible and Non-edible oil yielding plants in each families was calculated by the statistical software of statskingdom.com.

Results and Discussion
Edible oil Yielding Plants
Table 1 depicts palatable oil yielding plants. An aggregate of 22 varieties having a place with 15 families were recorded by Nagaraj Parisara and Kiran [4]. Among families Arecaceae and Cucurbitaceae were predominant with 3 species followed by Malvaceae, Poaceae and Apiaceae with 2 species each separately (Figure 1).
Coconut oil is a consumable oil removed from the piece of developed/riped coconut palm (Cocos nucifera). It has different applications. It has high soaked fat substance, it is delayed to oxidize and, in this manner, impervious to rancidification, enduring as long as a half year at 24 °C (75 °F) without ruining (Coconut oil, 2015) [5].
Arachis hypogea oil give a charming tasting for utilization (The plant list, 2013). Like different vegetables, peanuts harbor advantageous nitrogen-fixing microscopic organisms

in root knobs (en.wikipedia.org).This ability to fix nitrogen implies peanuts require less nitrogen-containing manure and improve soil fruitfulness, making them significant in yield pivots.

Zea mays is rich in starch. Maize flour is a significant fixing in home cooking and in many industrialized food items. Maize is additionally a significant wellspring of cooking oil (corn oil) and of maize gluten. Maize starch can be hydrolyzed and enzymatically treated to deliver syrups, especially high fructose corn syrup, a sugar; and furthermore aged and refined to create grain liquor. Grain liquor from maize is generally the wellspring of bourbon. Maize is once in a while utilized as the starch hotspot for lager. Maize is generally developed to take care of animals, as rummage, silage (made by maturation of cleaved green cornstalks), or grain. Maize supper is additionally a critical element of some business creature food items, for example, canine food (en.wikipedia.org).

Punica granatum are utilized in cooking, baking, supper trims, juice mixes, smoothies, and mixed drinks, for example, mixed drinks 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, 1999) [3].

Non-Edible oil yielding Plants

Harish Kumar and Kiran (2016) [7, 9] have listed the non-edible oil yielding plants having 27 species belonging to 23 genera and 17 families. The dominant families of their study were Fabaceae and Apocynaceae with 4 species each followed by Euphorbiaceae with 3 species (Figure 1). The oil obtains from such plant seeds is used for the manufacture soaps, candles, paints, varnishes, linoleum, lighting etc.

In India Saroj Padhi and Singh (2011) [10] assessed the bio-chemical and genetic attributes of the different tree borne oilseeds and these plants provides farmers with substantial income.

Ananth Nag *et al* (2010) [2] surveyed *Pongamia pinnata* plant in Bhadravathi town area during January to September 2007 to know the density of this plant and impact on morphological characteristics on the yield efficiency. Lot of wasteland was found in the Bhadravathi taluk, recognition of the potential use of these species as a source of biofuels and in wasteland reclamation has got promising scope. Their paper reflects on the ecological and economical benefits as an energy source. They concluded that the *Pongamia* species can be grown as a commercial crop in wastelands and will be the source of energy in future.

Millettia pinnata oil is used for lighting and can be used as bio-fuel in tractor and generators. *Azadirachtha indica* oil is used in soap industries, in case of pharmaceuticals, pesticides and boot polishing. *Santalum album* oil is used in the manufacture of soap, cosmetics and agar bathies.

Ricinus communis oil is an automotive lubricant for two-stroke engines due to high resistance to heat compared to petroleum-based

oils and used for internal combustion of engines Eucalyptus oil from the leaves can be used for cleaning, industrial solvent, antiseptic, deodorizing, and in very small quantities in food supplements (en.wikipedia.org).

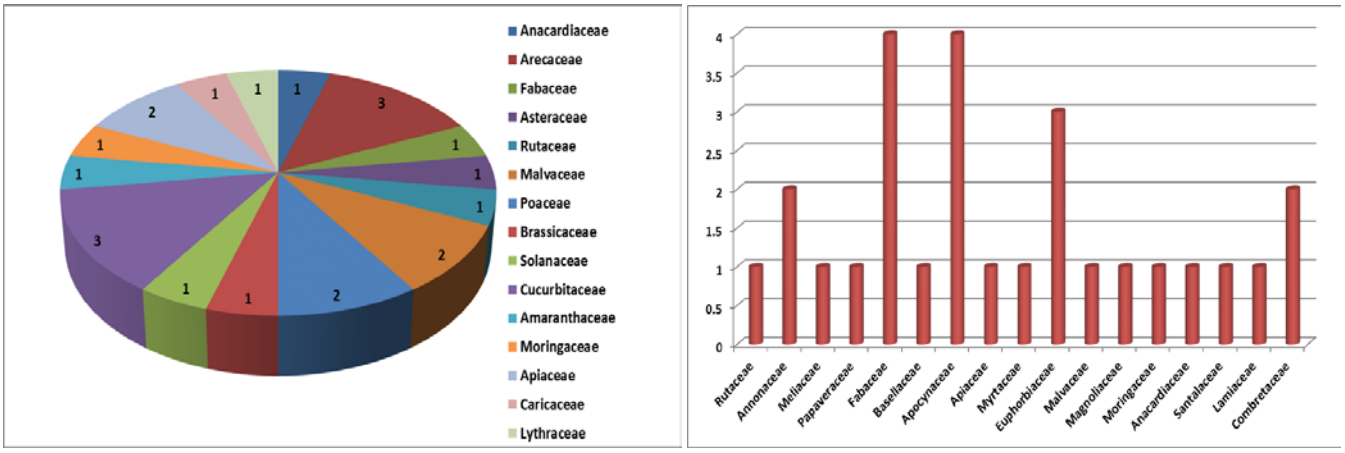

Fig 1: Number of Edible and Non-edible oil yielding plants in each families

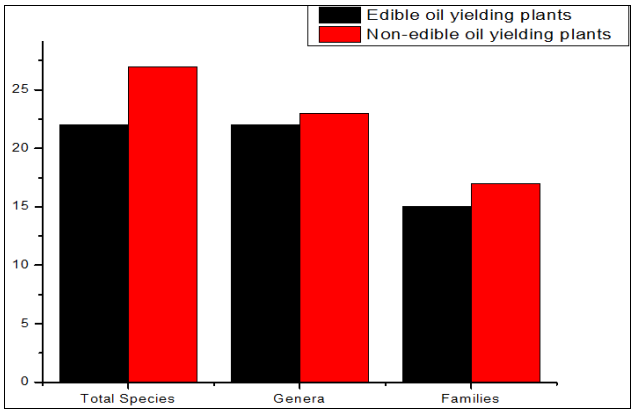

Fig 2: Total number of species, genera and families of Edible & Non edible oil plants

Table 1: Analysis of Variance and Tukey HSD test for Edible and Non-edible oil yielding plants in each families

Source	DF	Sum of Square	Mean Square	F Statistic	P-value
Groups (between families)	1	0.133335	0.133335	0.148938	0.702469
Error (within families)	28	25.066651	0.895238		
Total	29	25.199985	0.868965		

One Way ANOVA test, using F distribution df (1, 28) (right tailed)

H_0 hypothesis

SINCE p-value > α, H_0 is accepted. The averages of all groups considered to be equal. In other words, the difference

between the averages of all groups is not big enough to be statistically significant (Table 2).

P-value

p-value equals **0.702469**, [p(x ≤ F) = 0.297531]. This means that if we would reject H_0, the chance of type1 error (rejecting a correct H_0) would be too high: 0.7025 (70.25%) The larger the p-value the stronger it supports H_0.

The statistics

The test statistic F equals 0.148938, is in the 95% critical value accepted range: [-∞: 4.1960].

Effect size

The observed effect size f is small (0.073). That indicates that the magnitude of the difference between the averages is small. The η^2 equals 0.0053. It means that the group explains 0.5% of the variance from the average (similar to R^2 in the linear regression).

Tukey HSD / Tukey Kramer

As in Table 3 there is no significant difference between the means of edible and non-edible oil yielding plants.

Table 2: Tukey HSD / Tukey Kramer data

Pair	Difference	SE	Q	Lower CI	Upper CI	Critical Mean	p-value	Group	X^2
x1-x2	0.133334	0.244300	0.545780	-0.574375	0.841043	0.707709	0.702469	X1	0.13

Conclusion

Edible oil yielding plant seeds have been used as cooking oil and other food supplements. While, non- edible oil yielding plant seeds have been used for biofuel production. These species have grown in waste lands. Plantation of nonedible oil bearing trees in wastelands result in substantial quantities of biofuel can be available in future. It is believed that the Non- edible oil bearing plant resources of the Bhadravathi area provides a checklist of the floristic diversity which will serve as a ready reference for scientists and policy makers.

Conflict of Interest

The authors do not have any conflict of interest.

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