



Research Article

STUDY OF UNDERUTILIZED FRUIT PLANTS AS SOURCE OF FOOD AND ETHNOMEDICINE IN FEROZEPUR JHIRKA

PAWAN KUMAR¹, AJIT KUMAR¹ AND MANISH KUMAR¹ AND RAM KISHAN²

¹Government Senior Secondary School, Ferozepur Jhirka, Nuh, Haryana, 122104, India

²Government Model Senior Secondary School, Nuh, Haryana, 122104, India

*Corresponding Author: Email - pk5gene@yahoo.com

Received: November 21, 2018; Revised: December 26, 2018; Accepted: December 27, 2018; Published: December 30, 2018

Abstract: The area of present investigation was Ferozepur Jhirka block located in the Nuh district of Haryana, India which is surrounded by the oldest mountain range- The Aravali Hills. This area is having a considerable biodiversity of underutilised plants which are not harness fully due to which a wide gap is formed between health and optimal use of natural source of nutrients. In this investigation we were studied and surveyed the Underutilized fruit plants like Kachari, Lasora, Jaal, Kair, Jhari Ber *etc* which are lesser-known plant species. The present study revealed that the total 24 plants species belongs to 21 genera and 15 families which are commonly consumed by the local people of the area for flavor and taste with a very low knowledge about their nutritional and health benefits. These fruits such as Sahjan, Karonda, Jaal, Lasora *etc* are the rich source of nutrients, vitamins, minerals and dietary fibers which have the nutritional potential to prevent and cure the malnutrition problem and become a solution to the poverty and unemployment.

Keywords: Underutilised plants, malnutrition, Kachari, Jaal, Kair, Jhari Ber

Citation: Pawan Kumar, *et al.*, (2018) Study of Underutilized Fruit Plants as Source of Food and Ethnomedicine in Ferozepur Jhirka. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 10, Issue 24, pp.- 7624-7627.

Copyright: Copyright©2018 Pawan Kumar, *et al.*, This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Introduction

Many wild fruits notably have been exploited from wild for centuries across Indian subcontinent on account of its food and medicinal properties. Some wild fruits have been identified to have better nutritional value than cultivated fruits and a source of income for local population which are known as underutilised fruit plants. Underutilized fruit plants have poor shelf-life, unrecognized nutritional value, poor consumer awareness and reputational problems, therefore also called as poor people's food [1]. These are also referred as minor, orphan, neglected, underutilized, underexploited, alternative, local, traditional marginal crops and have been included world-wide plans of action, after having successfully raised the interest among decision makers. The fruits and vegetables have plenty of natural antioxidants, like vitamin C and E, beta carotene, phenolic compounds such as antocyanin and other flavonoids which shows different benefits including antioxidant, anti-inflammatory, anti-carcinogenic properties. Some recent studies suggest that consumption of fruits and vegetables can reduce the risk of both cancer and cardiovascular diseases because they are rich source of Vitamin C and E, flavonoids and carotenoids. The flavonones are mainly present in citrus fruits. As a result, in recent time, it is urgent need to evaluate various wild edible fruit plants for their nutritional features [2]. The rural people of the Ferozepur Jhirka region located in Nuh district (Aspirational District according to NITI Ayog, New Delhi) of Haryana traditionally harvest variety of green vegetable, tubers, roots and fruits from wild plants because of its taste, cultural uses, as food supplements or to tide over food shortage. These wild plants have been recognized to have potential to meet household food and income security and socio-economic upliftment of this backward region. The area under study is having the problem like malnutrition, anemic and poverty due number of socioeconomic reasons. The local peoples of this region generally consumed the underutilised fruits at some extent [3]. Thus, the consumption of these fruit plants can provide nutrition to the poor and needy person of the area. Keeping these points in mind, this investigation was planned to study these fruit plants for their utilization and awareness among the local peoples about the nutritional, health benefits and

methods for conservation and use of underutilised fruits for ecological sustainability.

Materials and Methods

Study Area

The survey area Ferozepur Jhirka is located in Nuh district of Haryana at 27.8° North latitude, 76.95° East longitude and 205 meters which is a hilly region, comprising the portions of ancient Matsya-desh and Surasena or modern southern part of Haryana and is inhabitants of the Meos community in majority. The region is bordered by the Aravli Hills in the east and west, Alwar district of Rajasthan in the south and the west and Gurugram and Palwal district in the north. Various types of soil in the District are available *i.e.*, loamy clay, loamy, clay and sandy. This is the Sub-Tropical, Semi-arid climatic zone with extremely hot temperature in summer and average rain fall is 594 mm.

Methodology

The survey was carried out repeatedly from during different seasons from July 2017 to October 2018. The information on underutilised fruits were collected through several informal interviews based on questionnaire and discussions with the 100 local peoples of different age and gender and local healers that have long association with the usage of these fruits in different ten villages namely Pathkhori, Sidhrwat, Ferozepur Jhirka, Sakras, Biwan, Agon, Ghata Shamashabad, Rawali, Mahun and Bhond of the area [Fig-2] The local name, plant part used and medicinal uses were also recorded for these fruits. The data collection and voucher specimen during the field study is based on the Jain and Rao [4]. All fruit species Specimens were collected, photographed and identified with the help of available floras. The medicinal uses of these plant species were cross checked from the available literature and from the local healers. Voucher specimens were prepared in the form of herbarium and deposited in the Biology Department, Government Senior Secondary School Ferozepur Jhirka, Nuh, Haryana.

Table-1 List of important Underutilized fruit Plants studied in present investigation in the region of Ferozepur Jhirka, Nuh

SN	Local Name/ Botanical name/ Plant Family	Type of plant	Time of fruiting	Nutrients & minerals present in fruits	Ethanomedicinal Uses	Potential as Nutraceutical
1	Peelu, Jaal <i>Salvadora oleoides</i> Salvadoraceae	Tree	June-July	Protein, Carbohydrate and Fats, Ca, P, Fe	consume as ripen fruit (Peelu), pickle, cooked vegetable, Used to cure digestion ailments, cough fever, and asthma, oral and dental problems.	Highly potent
2	Jhari Ber <i>Ziziphus jujube</i> Lam., <i>Ziziphus nummularia</i> Rhamnaceae	Shrub	Nov-Jan	Vitamin-C, A, B ₂ , Ca, P, Fe	Consume as ripen fruit (Ber) treatment of dyspepsia, fever and wound healing and also promote the growth of hairs	Highly potent
3	Lasora <i>Cordia dichotoma</i> Frost. Boraginaceae	tree	March-June	Proteins, Ca, P	Consume as ripen fruit, pickle, and cooked vegetable. It is very useful in ulcers, headache and urinary diseases.	Highly potent
4	Gondhani <i>Cordia rothii</i> Roem. & Schult. Boraginaceae	tree	May-June	Rich source of phytochemicals like alkaloids, glycoalkaloids, coumarins and inorganic salts P	Consume as ripen fruit, pickle, cooked vegetable Root, bark and leaves are used to cure malaria, intestinal disorders and conjunctivitis.	Highly potent
5	Kair/Peechu <i>Capparis decidua</i> (Roth.) Capparaceae	shrub	April-May	Protein-15-18%, Phosphorous	Used to treat scurvy and fruits are used in preparation of pickle. Ripen fruit known as <i>peechu</i>	Highly potent
6	Kacheri/Ram Kacheri <i>Coccinia indica</i> Cucurbitaceae	climber	Aug-Nov	Protein- 15-18% Vitamin C, etc	Fruits and seeds are use used raw and have digestive properties.	Highly potent
7	Neem <i>Azadirachta indica</i> Meliaceae	tree	May-June	Proteins, carbohydrates and minerals like Ca, K, Mg, Na, P	Fruit commonly known as Neemoli, Useful for skin diseases, digestion problem and heart alignments. As insect replant	Highly potent
8	Karonda <i>Carissa carandas</i> L. Apocynaceae	shrub	July-Sept	Proteins and minerals like Ca, P, Fe, Vitamin C	Fruit is rich source of iron and vitamin C. Mature fruits is harvested for pickles, jam, syrup, chutney and also used for treatment of anemia.	Highly potent
9	Gullar <i>Ficus glomerata</i> Moraceae	tree	Oct-May	Proteins, Carotene and minerals Ca, Zn, p, Na, Vitamin A, C	For energy and strength. For mouth ulcer It has Healing power	Highly potent
10	Bargad <i>Ficus benghalensis</i> Moraceae	tree	Oct-May	Protein, Ca, P, Zn, Vitamins	For energy and strength	To evaluate more
11	Peepal <i>Ficus religiosa</i> Moraceae	tree	Oct-May	Rich source of vitamins and some essential amino acids such as isoleucine, and phenylalanine Zn	Fruits are known as Barbanta by local people.	To evaluate more
12	Shatoot <i>Morus alba</i> Moraceae	tree	March-April	Protein, Vitamin C, K ₁ , E and minerals Fe Ca,	Beneficial for heart patients	Highly potent
13	Keekar/babool <i>Vachellia nilotica</i> Fabaceae	tree	Sept-Oct	Proteins and minerals like Zn, Ca, P, Fe, Vitamin C	Fruit powder mixed with sugar and ghee to form ladoo which are beneficial for joint pain and vigours in human beings	Highly potent
14	Bel <i>Aegle marmelos</i> L. (Corr.) Rutaceae	tree	March-June	Pulp contains water, sugars, protein, fiber, fat, calcium, phosphorus, potassium, Iron, minerals and vitamins	Fruit pulp is used in diarrhea and dysentery.	Highly potent
15	Jamun <i>Syzygium cumini</i> Myrtaceae	tree	June-July	Ca, Fe, Mg, P, Na, Vitamin C, B ₆	Useful for diabetic patients	Highly potent
16	Peelpota <i>Physalis minima</i> Solanaceae	herb	Sept-Oct	Proteins, Vitamin A, C and Ca, Fe	Useful for digestion problems	To evaluate more
17	Imli <i>Tamarindus indica</i> L. Caesalpinaceae	tree	May	fair source of Vitamin C, B and minerals like P, K, Ca and Mg	Bark, fruits and seeds are used as blood purifier, cholera and snakebite.	Highly potent
18	Khareti <i>Sida acuta</i> Brum. F. Malvaceae	herb	Sept-Oct	Protein, Fe, Ca, Zn	Seeds of ripen fruit consumed with <i>mishri</i> and water for treatment of bleeding from nose .Root is used for itching.	To evaluate more
19	Jangli Karela <i>Momordica charantia</i> L. Cucurbitaceae	climber	July-Aug	Mg, Fe, Ca, Beta-carotene, Vitamin C, K ₁	Fruits as vegetable. Used for the treatment of diabetes, cough respiratory diseases, skin diseases, wounds, ulcer and rheumatism.	Highly potent
20	Shajan <i>Moringa oleifera</i> Moringaceae	tree	March-April	Proteins Vitamin C, K ₁ , Folate, Zn, Mg, Ca	Useful for anemic conditions, Digestive problem, improving immunity and vigor	Highly potent
21	Gokharu <i>Tribulus terrestris</i> Zygophyllaceae	runner	Aug-Sept	Ca, P, Zn	Whole plant is used in Fever, Sterility and skin disease.	Highly potent
22	Garmunda/Indrayan <i>Citrullus colocynthis</i> L. Cucurbitaceae	climber	Aug-Sept	high protein contents, antioxidants	Fruits, seeds and root are used in respiratory, intestinal and urinary problems.	Highly potent
23	Jawar <i>Sorghum bicolor</i> (L) Moench Poaceae	Herb	Aug-Sept	Ca, Fe, P, K, Na, Vitamins	Sorghum is used in traditional medicine to cure anemia, cancer, and a variety of infectious diseases.	To be evaluated more
24	Bili ka ladoo/ Tiger-foot- Morning <i>Ipomoea pes-tigridis</i> Convolvulaceae	climber	Aug-Sept	Proteins, P	Fruit used for wound healing, swelling and poisonous sting.	To be evaluated more

Results and Discussion

The fruit crops which are less available, less utilized, rarely used and region specific are known as Underutilized fruits. This condition is fulfilled by the all plants under study [5]. Underutilized plant species have a distinctive past in terms of their use and value, but their use is currently limited relative to their economic potential [6, 7]. The present surveys revealed that the Ferozepur Jhirka region, there were a number of underutilized fruit plants which are valuable from medicinal and nutritional point of view. According to the survey, these fruits were developed in different seasons depending upon their adaptability and life cycle. The present study was conducted in the area shown in map [Fig-1] which revealed that 24 species were being used as underutilised fruit [Table-1]. These species belongs to 21 genera and 15 plant families [Fig-2] among them most were trees, some were shrubs & herbs, few were climbers and runners [Fig-3]. The survey indicated that, the study area has considerable diversity of underutilised fruits which are consumed as food and medicinal purposes [8]. Earlier studies also revealed that the economically backward and local peoples of Nuh district prefer folk medicine due to low coast and sometimes it is a part of their social life and culture. It is evident from the study that the knowledge about the nutrient and medicinal benefits of these fruits are limited to traditional practioners and elderly persons who are living in rural area [Fig-1] [9]. These underutilized fruits like Jaal, Jhari Ber, Kair, Karonda, Lasora, Gullar, Kachari, Keekar, Bel, Sahjan, Garmunda etc. are rich source of carbohydrate, proteins, energy, vitamins-A,B1, B2,B3, B6, B9, C, folic acid and minerals-Calcium, Phosphorus, iron, Zinc and dietary fibers. Thus, they have the nutritional capacity to prevent and cure the deficiency of nutrition among local peoples and some other common ailments [1, 10]. In the present investigation, we observed that the fruits namely Karonda, kair (teet), Kacheri, Lasora, Sahjan are consumed in unripe form as vegetable in raw/chutney/pickle form [Fig-4]. The ripen form of kair fruit is known as Peechu, Jaal fruit as Peelu, Gullar fruit as Barbenta which are commonly used for taste and flavor in this area with very little knowledge about their nutritional and health benefits. The peelu fruits are used in dental and oral problem by local peoples. The Goondhi fruit are consumed in mouth ulcers. Moringa oleifera (Sahjan) is a highly nutritive fruit which contains much type of mineral, vitamins and proteins which are useful in anemic conditions and some other alignments [2, 11,12]. This study revealed that the Ficus species (*Ficus religiosa* *Ficus benghalensis* *Ficus glomerata*) are worshiped for religious purposes and considered as sacred grooves like Jaal plant. The fruit of these species are known as Barbenta (Peepal/Bargad), Gular (Gullar) among the local population. During the summers, the local peoples eaten the fruits like Peelu, Lasora, Jamun etc without knowing their nutritional value. The fruit powder of Gokharu, Keekar and Sahjan were commonly eaten in the form of laddoo which are made by frying in ghee and mixing the sugar by local persons. These dishes are highly nutritive and helpful for improving the strength and vigor. In the present survey, the Karonda, Shatoot, jamun, Jhari Ber, jangeli Karela are a rich source of vitamin C which help the local population from scurvy disease and it improve the immunity of the peoples. The present study revealed that some fruits like Sahjan, Karonda, Jahri Ber, Jaal, Kair, Jawar, Shatoot, Bili ka laddoo are useful for anemic patients as they have considerable amount of iron or folic acid [2, 13].

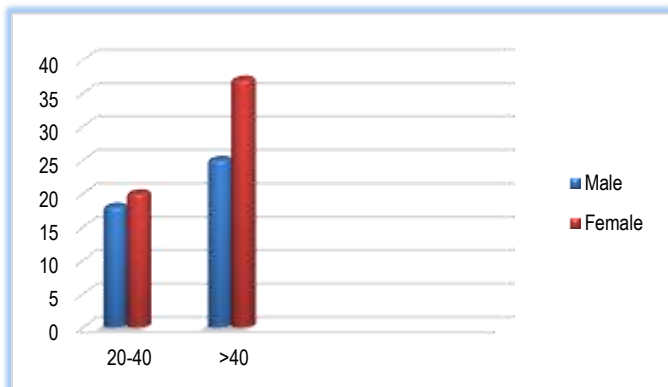


Fig-2 showing proportion of male and female persons from which data was collected.

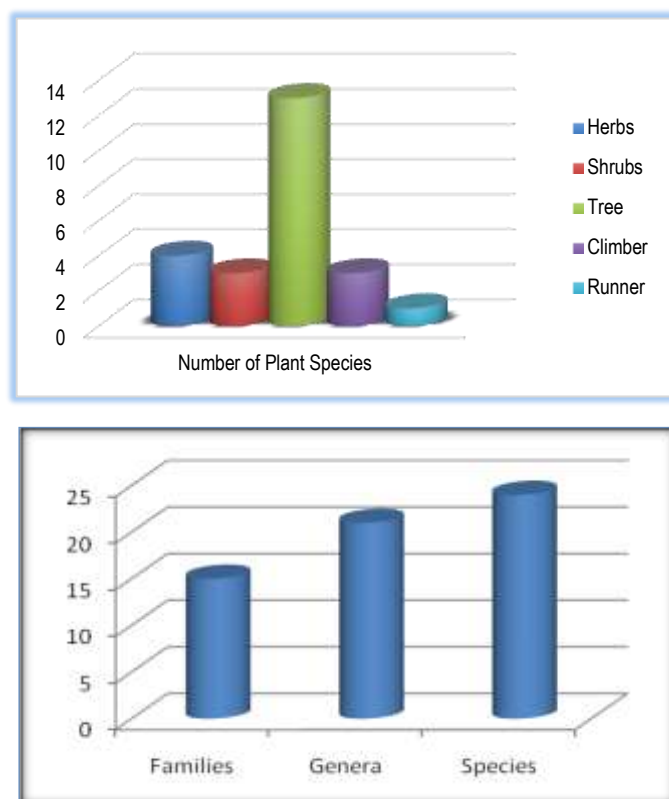


Fig-3 A. showing proportion of Herbs, shrub, climber, runner and tree. B. No. of families, Genera and species of underutilized fruits under study



Fig-4 Survey and collection of Data from local persons for Some Underutilised fruits plants



Fig-5 Some Underutilized fruits and their products like: a.) Jahri Ber, b.) Kacheri

On the basis of present investigation, it is required to conserve these threatened and endangered fruit plants which are rich source of nutritional and therapeutically important phytochemicals having much potential for eradication the nutritional problem and socioeconomic issue in sustainable manner at local level [2, 14-16].

Conclusion and Future Perspective

This study of underutilized fruits of Ferozepur Jhirka region revealed that the region has a considerable diversity of these fruits and most of them are highly nutritive and medicinally beneficial to the local population [Fig-5]. Most of these fruits are commonly eaten as raw material or cooked. These fruits have many advantages like easier to grow and naturally adapted to hardy climate, producing the fruits even under adverse soil and climate conditions. So, exploitation of underutilized fruits can become a solution to the social problem of health and nutrition insecurity, poverty and unemployment among the local population. The local people can get socioeconomic security by sale of these fruits in raw form as well as value-added products [Fig-5]. Hence, research and development work, awareness to farmers and feasibility for the cultivation of underutilized fruits must be due consideration. These fruits plants become the future food that is known as nutraceutical. The nutraceutical is opposite to the junk foods that are based on such traditional plant-based systems of medicine as photochemical, nutritional constituents or as functional food. The functional food having ingredient/component with specific medicinal or physiological benefit other than nutritional effects). However, an increased human activity due to unauthorized mining of mountains, grazing of animals, making of dams and ponds near to valley of hills and urbanization is posing a threat not only to flora of this region but also to the species which are commonly used as medicine by local peoples [3,15]. Therefore, there is an urgent need to spread awareness among local people by promoting measures such as banning on illegal mining, controlled grazing, reforestation, proper land management to promote the sustainable use of these potential fruits which helps in eradicating the malnutrition of local area. Needs to conserve and protect these plants as some of them are threatened and endangered species [2]. The present study also suggest that a National Mission for Utilization and Conservation of Underutilized plants should be planned at state and national level by the government agencies.

Application of research: the present study become a stepping stone to evaluate Underutilized fruit plants as important "Food for 21st century" for improving the nutritional status as well as increasing resilience of agro- and horti-food systems [15].

Research Category: Ethnomedicine

Acknowledgement / Funding: Authors are thankful to Government Senior Secondary School, Ferozepur Jhirka, Nuh, Haryana, 122104, India

***Principal Investigator or Chairperson of research:** Pawan Kumar

Institute: Government Senior Secondary School, Ferozepur Jhirka, Nuh, 122104
Research project name or number: PhD Thesis

Author Contributions: All authors equally contributed

Author statement: All authors read, reviewed, agreed and approved the final manuscript

Conflict of Interest: None declared

Sample Collection: Survey area Ferozepur Jhirka is located in Nuh district of Haryana

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.
Ethical Committee Approval Number: Nil

References

- [1] Thakur M. (2014) *Food Science Research Journal*, 5, 174-183.
- [2] Kour S., Bakshi P., Sharma A, Wali V.K., Jasrotia A. and Kumar S. (2018) *Strategies on Conservation, Improvement and Utilization of Underutilized Fruit Crops*.
- [3] Jain S. K. and Rao R. R. (1977) *Handbook of Field and Herbarium Methods*, Today and Tomorrow Printers & Publ., New Delhi, India
- [4] Joshi V., Gautam P.L., BhagMal, Sharma G.D. and Kochhar S. (2002) *International Journal of Current Microbiology and Applied Sciences* 7(03),638-650
- [5] Vino S.A., Harshita and Sinija V.R. (2016) *Indian Food Industry Mag* 35 (2).
- [6] Williams J.T. and Haq N. (2002) *Global research on underutilized crops - an assessment of current activities and proposals for enhanced cooperation*. Southampton, UK, International Centre for Underutilized Crops. ISBN 92-9043 545-3.
- [7] Salvi J. and Katewa S.S. (2016) *International Journal of Botany Studies*, 1(4), 32-36
- [8] Kumar S., Flora of Haryana, (materials), Publishers Bishen S, Mahendra P S, Dehradun, India (2001)
- [9] Dansi A., Vodouh R.,Azokpota P., Yedomonhan H., Assogba P. and Adjatin A. (2012) *The Scientific World Journal*, 1-19
- [10] Yadav J. P. and Kumar S. (2009) *Plant Arch.*, 3, 42
- [11] Sharma M. P., Ahmad J., Hussain A. & Khan S. (1992) *International Journal of Pharmacognosy*, 30, (2), 129-134.
- [12] Singh Balkar & Singh Jagmahender (2014) *Phytodiversity*, 1 (1&2), 7-24
- [13] Nataraja Thamizh Selvam, Acharya M.V. (2015) *International Journal of Pharma Sciences and Research*, 6 (12), 1443-1448
- [14] Rajalakshmia P., Kumar S. Vishnu, Subhashinic G., Vadivel V. and Pugalenth M. (2017) *Indian J.Sci.Res.* 13 (1), 46-53, 2017
- [15] Rathore M. (2009) *Journal of Horticulture and Forestry*, 1(7), 103-108.