Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(3): 3726-3729
Received: 01-03-2019
Accepted: 03-04-2019

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Consumption pattern of minor millets among growers and non-growers of minor millets

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Abstract
The research study was conducted in Dharwad taluk of Dharwad district of Karnataka state during 2018. To know the consumption pattern of minor millets among growers and non growers of minor millets. The sample was selected with 60 millet growers, 60 non-millet growers from same village and 60 non-millet growers from different village, thus sample was 180 farm women. In the sampled villages, foxtail millet (*Navane*), little millet (*Savi*) were grown by majority of farmers in the restricted area. Co-relation research design was used with the pretested self structured schedule. The results revealed that, none of the respondents consumed millets daily. About 84.00 per cent of growers 87.23 per cent and 69.05 per cent of non growers of same village and different village respectively consumed millets occasionally. Though the respondents of all the category knew that millets are good for diabetic patient followed by prevents obesity, prevent occurrence of disease.

Keywords: Millet growers, millet non-growers, consumption pattern, minor millets, foxtail millet (*Navane*), little millet (*Savi*)

Introduction
Minor millets are tiny seeds, grown throughout the world for food and fodder purpose in dry land regions of world. These were important staple foods prior to introduction of fine cereals in India. Millets are grown on about 17 million ha. with an annual production of 18 million tonnes and contribute 10 per cent to the country's food grain basket (Rao *et al.* 2017) [2]. Millets are highly nutritious food grains. They are rich in fiber, vitamins and especially minerals like calcium, iron, zinc and potassium. Due to their low glycemic index, millets are good for diabetic patients. However over a period of time the consumption as well as cultivation of minor millets has significantly declined. The decline of minor millets cultivation in India can be attributed to many factors including economic, agronomic, and social. During Green Revolution period government has promoted high yielding hybrids the minor millets in to declining stage and also traditional processing methods often carried out by women are highly drudgery prone.

India is the top most producer of millets followed by Nigeria during the period 2000 and 2009. In India, seven millet species (Finger millet (*Ragi*), Foxtail millet (*Navane*), Pearl millet (*Bajra*), Little millet (*Savi*), Kodo millet (Harka) and Barnyard millet (Oodalu), Proso millet (Baragu)) are grown commonly under rain fed conditions. Generally, these are rain fed crops grown in areas with low rainfall and thus resume greater importance for sustained agriculture and food security. Further, in each of the millet cultivating areas at least 4 to 5 species are grown either as primary or allied crop in combination with oilseeds or pulses. Finger millet is a primary crop in Tamil Nadu and Gujarat, while the same is a minor crop in Telangana. Hence, the distribution of millets either as a primary crop or as allied crops depends on the growing habitat and the rainfall in that region.

A Kannada proverb likens the, little millet (savi) eater enhances his life span and foxtail millet (navane) becomes stronger, jowar eater to a wolf and ragi consumer to be free of illness (nirogi) where as rice eater to a frail bird. Thus indicating the superiority of coarse and minor millets. Minor millets are used for human consumption in most of the developing countries but their use has been restricted to animal feed in developed countries.

Indigenous products of minor millets *viz.*, mudde, ambali, holige, ganji/malt, rice, halva and fried products posses unique inherent nutritional processing and the therapeutic qualities. Products of millets have an excellent taste and crispy texture, light and fluffy characters, superior textural quality of cooked starch and blends well with milk and milk products. Tradition and culture have preserved the significance of millet use in special occasions.

Millets are nutritionally superior compared to cereals and serve as good source of protein, micronutrients and macronutrients. Processing methods like soaking, malting, and cooking

affect the anti-oxidant content and activity (Saleh *et al.*, 2013) [3]. Minor millets contains 12-16% protein and 2-5% lipids, millets are very good sources of micronutrients such as vitamins and minerals and millets have a better amino acid profile. We can see that highly nutritious grains are neglected but now a days gainng more popularity among health conscious people. So to know the consumption pattern of these nutritious millets this study has been initiated.

Methodology

The present study was conducted in Dharwad taluk of Dharwd district of Karnataka during the year 2018. Dharwad taluk was purposively selected for the study keeping in view the cultivation of millets, availability of time, cost and convenience of the researcher. A list of millet growing villages was prepared in consultation with the Raith Samparka Kendra. Two millet growing villages which have more number of millet growers were selected from Dharwad taluk *viz.*, Garag and Yadwad. From millet growing villages 30 farm women from each village millet growers and 30 women non-millet growers same villages selected.

Non millet growing area selected were Kavalgere and Nigadi village of Dharwad taluk. From each village, 30 women non millet growers were randomly selected as sample. Thus total sample constituted was 180.

Pre tested self structured schedule was used to collect the data of respondents by personal interview method. The respondents were asked to mention the periodical gap of consumption of minor millets by their families. Form of consumption, perception of respondents about health benefits, awareness about millet related programmes were considered.

Result and discussion

Table 1: Minor millets grown by the respondents n = 60

Sl. No.	Village	Minor millets	Frequency	Percentage
1.	Yadwad (n = 30)	Little millet (*Savi*)	13	43.33
		Foxtail millet (*Navane*)	29	99.67
2.	Garag (n = 30)	Little millet (*Savi*)	30	100.00
		Foxtail millet (*Navane*)	10	33.33

Note: Multiple responses are possible

Table 1 reveals that, in Yadwad almost all respondents (99.67%) have grown foxtail millet (*Navane*) and 43.00 per cent grown little millet (*Savi*). In Garag cent percent of respondents grown little millet (*Savi*) and one third (33.33%) per cent of respondents have grown foxtail millet (*Navane*). The possible reasons might be millets were cultivated to meet feed and fodder requirement for cattle (Hemalath *et al.* 2013) [1] and other added advantage was of early maturity of these crops and requires less fertile soil and low rainfall, thus providing livelihood security for the farming families.

Table 2: Consumption pattern of minor millets by the families n = 180

	Growers (n_1 = 60)					Non–growers (Same village) (n_2 = 60)					Non–growers (Different village) (n_3 = 60)				
	Foxtail millet (*Navane*)	Little millet (*Savi*)	Bajra (*Sajje*)	Finger millet (*Ragi*)	Over all	Foxtail millet (*Navane*)	Little millet (*Savi*)	Bajra (*Sajje*)	Finger millet (*Ragi*)	Over all	Foxtail millet (*Navane*)	Little millet (*Savi*)	Bajra (*Sajje*)	Finger millet (*Ragi*)	Over all
Twice in week	1 (1.67)	-	-	1 (1.67)	1.67	-	-	-	1(1.67)	1.67	-	-	-	1 (1.67)	1.67
Once in week	1 (1.67)	1 (1.67)	-	-	1.67	1(1.67)	1(1.67)	-	-	1.67	-	-	-	1 (1.67)	1.67
Monthly	10 (16.67)	13 (21.67)	1 (1.67)	4 (6.67)	17.02	5 (8.33)	8 (13.33)	-	3 (5.00)	10.20	2 (3.33)	3 (5.00)	1 (1.67)	8 (13.33)	9.28
Occasionally (festival)	48 (80.00)	37 (61.67)	59 (98.33)	53 (88.33)	84.28	54 (90.00)	41 (68.33)	59 (98.33)	52 (86.67)	87.23	43 (71.67)	1 (1.67)	43 (71.66)	39 (65.00)	69.05
Never	-	9 (15.00)	-	2 (3.33)	12.87	-	10 (16.67)	1 (1.67)	4 (6.67)	13.01	15 (25.00)	56 (93.33)	16 (26.67)	11 (18.33)	63.56

Table 2 shows that, none of the respondents were using minor millets regularly in their diet. When it is consider of overall consumption of millets in growers category, majority of the respondents were consumed occasionally (84.28%), about 17.00 per cent respondents consumed monthly and 12.87 per cent of respondents never consumed little millet (*Savi*) and finger millet (*Ragi*).

Regarding non-growers of same village almost same trend was observed 87.23 per cent respondents consumed occasionally, 10.20 per cent of respondents consumed monthly and 13.01 per cent of respondents were never consumed little millet (*Savi*), bajra (*Sajje*) and finger millet (*Ragi*).

In case of non-growers of different village 69.05 per cent of respondents were consumed millets occasionally, about 63.56 per cent of respondents were never consumed millets. Only 9.28 per cent of respondents were consumed millets monthly.

However none of the respondents were using minor millets regularly in their diet. Utilization of minor millets was observed during special occasions and festival (Yenagi *et al.* 2011) [5]. The reasons as expressed by the respondents were difficulty in processing of millets, rice is easier to clean and cook compared to millets. The other major reason might be that under public distribution system people were receiving rice at free of cost or a very low price and buying millets is expensive. Usually millets are traditionally consumed with milk and butter milk. At present with less availability of milk or high cost of milk, millet consumption might has been reduced considerably.

Table 3: Form of consumption of minor millets n = 180

Sl. No.	Ways (Form)	Growers (n_1 = 60)		Non–growers (same village) (n_2 = 60)		Non–growers (different village) (n_3 = 60)	
		F	%	F	%	F	%
1.	Foxtail millet (*Navane*)						
	Holige	60	100.00	60	100.00	37	61.67
	Rice	34	56.67	35	58.33	11	18.33
	Uppittu	25	41.67	24	40.00	-	-
2.	Little millet (*Savi*)						
	Rice	42	70.00	41	68.33	7	11.67
	Uppittu	24	40.00	24	40.00	-	-
	Paddu	12	20.00	05	8.33	-	-
3.	Bajra (*Sajje*)						
	Roti	60	100.00	59	98.33	41	68.33
4.	Foxtail millet (Ragi)						
	Roti	4	6.67	3	5.00	13	21.67
	Ambali	57	95.00	54	90.00	48	80.00
	Dosa	11	18.33	10	16.67	2	3.33

It was noticed from the Table 3 that, form of consumption among growers cent per cent of respondents consumed foxtail millet (*Navane*) in the form of holige (sweet prepared during festival), more than half of the respondents (56.67%) consumed in the form of rice followed by 41.67 per cent of respondents form of consumption was upma. In case of non-growers of same village similar result was seen. Regarding non-growers of different village 61.67 per cent of respondents were consumed it as holige (sweet prepared during festival), only 18.33 per cent of respondents form of consumption was rice.

The form of consumption of little millet (*Savi*) among growers 70.00 per cent of respondents consumed it as rice and 40.00 per cent of respondents consumed it as upma, only 20.00 per cent of respondents consumed it as paddu (a fermented breakfast food). Where as in millet non- growers of same village similar form of consumption was found *i.e.*, 68.33 per cent of respondents consumed it as rice and 40.00 per cent and 8.33 per cent of respondents consumed it as upma and paddu (a fermented breakfast food) respectively. In non-growers of different village only 11.67 percent consumed it as rice.

Form of consumption of bajra (*Sajje*) roti was found in all categories. Cent per cent of growers, 98.33 per cent of non-growers of same village and 68.33 per cent respondents from non-growers of different village consumed bajra in roti form.

Finger millet (*Ragi*) ambli was form of consumption, it was observed in growers 95.00 per cent, where as 90.00 per cent percent in non-growers of different village and 80.00 per cent in non-growers of different village. Finger millet was consumed in the form of dosa. It was observed 18.33 per cent in growers, 16.67 per cent in non-growers of same village and only 3.33 per cent in non-growers of different village. Another form of finger millet consumption was roti. Only 6.67 per cent of growers, 5.00 per cent of non-growers of same village and 21.67 per cent non-growers of different village consumed it as roti.

As a traditional custom in villagers prepare holige on special occasion (*i.e.,* Shige hunnime). In the study area also we could observe that a high per cent of respondents were preparing holige among both growers and non-growers. Another form of foxtail millet (*Navane*) consumption was in the form of rice. Ancestors used to consume millets daily but due to exposure to many other foods, changing cropping patterns and due to change in food habits, the consumption of millets has declined. In case of non-growers of same village though they not grow in their land but as a traditional food majority consumed in the form of rice and paddu. Whereas in non-growers of different village very few per cent are consumed rice as the traditional food. Another important millet is bajra (*Sajje*) and in two festivals usually Sajje is used to prepare roti for local festivals *i.e.,* Nag Panchami and Yella amavasye. Since it is custom we could see that almost cent per cent of respondents consumed the millets irrespective of whether growers or non-growers. Although in the study area none of respondents grow finger millet (*Ragi*) but awareness is high. Finger millet (*Ragi*) ambali was traditionally consumed in summer season. Ambali is a finger millet (*Ragi*) flour preparation in combination with the butter milk which has a cooling effect in the summer season. Hence we could observe that majority of growers and non-growers consumed it.

Table 4: Perception of the respondents about health benefits of minor millet consumption n = 180

Sl. No.	Benefits	Growers (n_1 = 60)		Non–growers (Same village) (n_2 = 60)		Non–growers (different village) (n_3 = 60)	
		F	%	F	%	F	%
1.	Provide nutrition	20	33.33	19	31.67	9	15.00
2.	Improves blood production	15	25.00	-	-	-	-
3.	Good for diabetic patients	49	81.67	47	78.33	40	66.67
4.	Prevents obesity	29	48.33	25	41.67	24	40.00
5.	Prevents occurrence of diseases	19	31.67	16	26.67	15	25.00
6.	Ideal Weaning food	20	33.33	17	28.33	9	15.00

Note: Multiple responses are possible

Table 4 depicts the perception of the respondents about health benefits of minor millet consumption. Growers perceived as it was good for diabetic patients (81.67%), prevent obesity (48.33%), it provides nutrients and ideal weaning food (33.33%) and prevent occurrence of diseases (31.67%). Only 25.00 per cent of respondents perceived as it was improved blood production in body.

Whereas in non-growers of same village 78.33 per cent perceived as it was good for diabetic patients. About 41.67 percent, 31.67 per cent, 28.33 percent, 26.67 per cent perceived it as prevents obesity, provide nutrition to body, ideal weaning food for children and prevents occurrence of diseases respectively.

Among non-growers of different village perceived it is good for diabetic patients (66.67%), prevent obesity (40.00%) and prevents occurrence of diseases (25.00%). Only 15.00 per cent of respondents perceived it as provides nutrient to the body and ideal weaning food for children.

According to their perception majority of the respondents perceived millets as food for diabetic patients. Less than half of the respondents perceived that millets prevent obesity. More than one fourth of respondents perceived it as ideal weaning food that provides nutrition to body followed by prevention of occurrence of diseases and improvement in blood production.

Table 5: Relationship between the independent variables and consumption pattern n = 180

Sl. No.	Independent variables	Growers consumption pattern "r" value ($n_1 = 60$)	Non-growers consumption pattern (same village) "r" value ($n_2 = 60$)	Non-growers consumption pattern (different village) "r" value ($n_3 = 60$)
1.	Age	0.458**	0.190^{NS}	0.177^{NS}
2.	Education	0.128^{NS}	0.021^{NS}	0.008^{NS}
3.	Annual income	0.397^{**}	0.166^{NS}	0.076^{NS}
4.	Land holding	0.493^{**}	0.187^{NS}	0.145^{NS}
5.	Size of family	0.317^{*}	0.165^{NS}	0.126^{NS}
6.	Mass Media exposure	0.349^{**}	0.335^{**}	0.193^{NS}
7.	Contact with extension agency	0.356^{**}	0.228^{**}	0.130^{NS}

Note: ** Correlation coefficient significant at 0.01 per cent level
* Correlation coefficient significant at 0.05 per cent level
NS: Non-significant

Table 5 showed that, age, annual income, land holding, size of family, mass media exposure and contact with extension agency were positively and significantly correlated with consumption of growers. The probable reasons might be the middle age and old age people may be well aware of health benefits of minor millets so consumption of millets so as grow older consumption also increased. As land holding are more they might have used some piece of land to grow traditional food. Land holding increases the consumption of minor millets also increased because they prefer to grow more variety of crops. Higher the mass media exposure more will be the possession of knowledge regarding minor millets, when the knowledge increases consumption of minor millets might have been increased. Contact with extension personnel who are meant to transfer knowledge might have helped respondents to gain more knowledge which directly influences consumption of minor millets. Education was found to have non-significant relationship with consumption pattern of growers.

Regarding non-growers of same village mass media exposure and extension contact were positively and significantly correlated with consumption pattern. Age education, annual income, land holding and size of family are non-significantly correlated with consumption pattern.

In case of non-growers of different village all selected independent variables had a non-significant relation with consumption pattern. Many health benefits have been observed due to the consumption of minor millets. These benefits will be realised due to many reason and education is one of the most important factor. Under such situation in the result presented in the table 5 relationship between the education of the respondents and their consumption pattern was found to be non significant. Since millets are grown earlier and elders have know the benefits of consumption of millets, mass media exposure and contact with extension agents effects might have influenced for the consumption in the present study. So the respondents are consuming millets though the education not influenced the consumption pattern of the respondents.

Conclusion

In all the categories of respondents were consuming minor millets in the form of traditional foods prepared during local festivals. Though they were growing minor millets basically for cattle feed and fodder and very little was consumed. It was observed from the study that none of the respondents were consuming minor millets daily though regarding perception about health benefits majority of the respondents knew that millets are good for diabetic patient followed by prevents obesity, prevent occurrence of disease. The reasons were difficulty of millet processing, under PDS (Public Distribution System) free or low cost availability of fine cereals (rice, wheat), rice is easier to clean and cook might be caused decline in consumption of minor millets. In order to increase consumption of minor millets more awareness programmes has to be initiated. Most of the post-harvest management practices were not adopted due to lack of knowledge, non-availability of improved post-harvest operation machines and lack of financial facilities.

Reference

1. Hemalatha S, Kamatar MY, Naik RK. Socio economic profile of millet growers in Karnataka. Res. J Agric, Sci. 2013; 4(3):333-336.
2. Rao DB, Bhaskarachary K, Arlene Christina GD, Sudha Devi G, Tonapi VA. Nutritional and health benefits of millets. Director, ICAR- Indian Institute of Millets Research, Hyderabad, 2017.
3. Saleh ASM, Zhang Q, Chen J, Shen Q. Millet grains: nutritional quality, processing, and potential health benefits. Comprehen. Rev. in Food Sci. and Food Safety. 2013; 12:281-295.
4. Shilpa YA. Food consumption pattern in Chikkaballapur district, Karnataka. M. Sc. (Agri.) Thesis, Univ. Agric. Sci., Bengaluru, Karnataka (India), 2014.
5. Yenagi NB, Naik S, Josna B. Knowledge and attitude of farm women towards millet consumption. Paper presented In: Natl. Symp. on Recapt. Nutri. Millets for health and Management of disease. Univ. Agric. Sci., Dharwad, 2011, 44p.