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Documentation of brown top millet

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Abstract

The browntop millet is grown in rainfed tracts of Tumakuru, Chitradurga and Davanagere districts of Karnataka state. In the present study the general information was collected by using pre structured questionnaire from farmers and farm women of Chitradurga, Davanagere and Tumkur district. In rainfed conditions among the millets cultivated, higher percentage of farmers cultivated little millet (92.53%) and least cultivated was browntop millet and pearl millet (78.50%). In irrigated conditions higher percentage of farmers cultivated browntop millet (21.50%) and least cultivated was little millet (7.44%). The millets consumed by farmers were kodo millet, proso millet, barnyard millet and browntop millet. The farmers consumed millet in the form of boiled rice and roti.

Keywords: brown top millet, kodo millet, proso millet, barnyard millet

Introduction

Millets are small-grained, round-shaped grains that belong to the Poaceae family (FAO, 2020)^[3]. They exhibit exceptional resilience to extreme weather conditions and can adapt to various soil stressors such as pH levels, moisture content, temperature fluctuations, and soil fertility variations. Millets can thrive in infertile soils and even in sandy regions. Notably, millets are the sole cereals capable of thriving in arid climates, enduring temperatures of up to 64 °C with an annual rainfall range of 350–400 mm (Chivenge *et al.*, 2015)^[5]. Millet seeds mature within a relatively short timeframe, typically spanning 6 to 8 weeks. Browntop millet (*Brachiaria ramosa* (L.) Stapf; *Panicum ramosum* L.) is a relatively rare crop, commonly known as Dixie or signal grass. Browntop millet cultivation can be found in various regions of the Karnataka, Andhra Pradesh, and Tamil Nadu states in southern India (Kimata *et al.*, 2000)^[4]. This crop is highly esteemed in the region for both cultivation and consumption. Browntop millet is underutilized millet which is neglected by the monocrop based agriculture system and is not popular for food use. There is limited information on brown top millet; hence the present study has been undertaken with the following specific objective was undertaken on utilization of brown-top millet.

Materials and Methods

Utilization of brown-top millet

Primary data was collected by directly interviewing the farmers and farm women from regions where it is cultivated in Karnataka (n=90) by using pre-structured schedule. Self- structured and pre-tested schedule random sampling technique was used to select the browntop millet cultivators. Southern part of Karnataka was selected to collect data as the browntop millet is mainly cultivated and consumed in the southern part of Karnataka.

Demographic profile of respondents

The minor millets are grown in Chitradurga, Davanagere and Tumkur districts of South Karnataka. Millets are rain fed crops and are grown in regions with low rainfall. This zone experiences semi-arid type of climate hence these districts were selected. The browntop millet was mainly grown and consumed in Hemidore (25) and Pavagda (18), Chitradurga, mallihali (25) and Davanagere, Bhimanere (39). Total of 107 farmers and farm women have been interviewed.

The schedule consists of household information, Family composition, questions related to land, questions on millet processing and the distance of the processing unit, use of grain/ husk portion of millets, use of millets in daily diet, what types of millets used in daily diet, Forms of millets used in daily diet, Frequency of consumption of millet products, questions on preparations of millet value added products and market of the product.

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Statistical analysis

Obtained experimental values were analyzed for frequency and mean for the given data. SPSS software (version 16.0) was used to analyze the data.

Results and Discussion

Information on millet cultivation in Karnataka

Table 1 infers the information of millets grown by farmers in their lands. Total eight millets were grown in the farmers land. The farmers grow millets were barnyard millet, Kodo millet, Proso millet, Browntop millet, Foxtail millet, little millet, Finger millet and Pearl millet. Farmers grow almost all millets from ancient period during kharif and rabi seasons. The percent of farmers growing millets under rainfed condition ranged from 78.50 to 92.53 percent. The percent of farmers growing millets under irrigated condition from 7.44 to 21.50 percent. During rain fed 90 (84.11%) and irrigated 17 (15.89%) respondents were growing barnyard millet in their field. The percent of farmers growing kodo millet were 82.24 percent in rain fed and irrigated 17.76 percent. Proso millet in rain fed condition 81.30 percent and in irrigated condition 18.70 percent. Browntop millet, foxtail millet, little millet, finger millet and pearl millet during rain fed 78.50 percent, 85.04 percent, 92.53 percent, 82.24 percent and 78.50 percent respectively. The percent of farmers who cultivated millets in irrigated condition were browntop millet (21.50%), foxtail millet (14.96%), little millet (7.44%), finger millet (17.76%) and pearl millet (21.50%). In rainfed conditions among the millet cultivated little millet was higher percentage of farmers (92.53%) and least was browntop and pearl millet (78.50%). In irrigated condition among the millet cultivated were browntop millet and pearl millet was higher percentage of farmers (21.50%) and least cultivated was little millet (7.44%).

All millets like Barnyard millet, Kodo millet, Proso millet, Browntop millet, Foxtail millet, little millet, Finger millet and Pearl millet were cultivated by farmers in rainfed as well as irrigated condition in Chitradurga by farmers. In rainfed conditions among the millets cultivated, higher percentage of farmers cultivated little millet (20.56%) and least cultivated was kodo millet (14.01%). In irrigated conditions among the

millets cultivated koda millet was higher percentage of farmers (9.34%) and least cultivated was little millet (2.83%). The farmers who cultivated barnyard, kodo, proso and browntop millet under rainfed conditions were 15.88 percent, 14.01 percent, 19.62 percent and 17.75 percent respectively. They also grew foxtail millet (18.69%), little millet (20.56%), finger millet (18.69%) and pearl millet (16.82%) under rainfed condition. The percentage of millets under irrigated condition were barnyard millet (7.47%), kodo millet (9.34%), proso millet (3.74%), browntop millet (5.60%), foxtail millet (4.67%), little millet (28.03%), finger millet (4.67%) and pearl millet (6.54%).

All millets like Barnyard millet, Kodo millet, Proso millet, Browntop millet, Foxtail millet, little millet, Finger millet and Pearl millet were cultivated by farmers in rainfed as well as irrigated condition in Davangere. In rainfed conditions among the millets cultivated, higher percentage of farmers cultivated little millet (31.77%) and least cultivated was browntop millet (20.56%). In irrigated conditions among the millets cultivated browntop millet was higher percentage of farmers (15.88%) and least cultivated was barnyard millet (8.41%). The percentage of farmers who cultivated millets under rain fed condition barnyard (28.03%), kodo millet (27.10%), proso millet (21.49%) and browntop millet (20.56%). They also grew foxtail millet (26.16%), little millet (31.77%), finger millet (23.36%) and pearl millet (21.49%) under rainfed condition. The percentage of farmers who cultivated millets under irrigated condition barnyard millet (15.89%), kodo millet (17.76%), proso millet (18.70%) and browntop millet (21.50%). They also grew foxtail millet (14.96%), little millet (7.44%), finger millet (17.76%) and pearl millet (21.50%).

All millets like Barnyard millet, Kodo millet, Proso millet, Browntop millet, Foxtail millet, little millet, Finger millet and Pearl millet were cultivated by farmers only in rainfed condition in Tumkuru by farmers. The percentage of farmers who cultivated millets under rainfed condition were barnyard millet (40.18%), kodo millet (40.18%), proso millet (40.18%), browntop millet (40.18%), foxtail millet (40.18%), little millet (40.18%), finger millet (40.18%) and pearl millet (40.18%). The farmers grew all eight millets only in rain fed condition.

Table 1: Cultivation of various millets in study area

N=107

Millets	Chitradurga (n=25)		Davangere (n=39)		Tumkuru (n=43)		Total (n=107)	
	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated
Barnyard millet	17 (15.88)	8 (7.47)	30 (28.03)	9 (8.41)	43 (40.18)	0	90 (84.11)	17 (15.89)
Kodo millet	15 (14.01)	10 (9.34)	29 (27.10)	10 (23.07)	43 (40.18)	0	88 (82.24)	19 (17.76)
Proso millet	21 (19.62)	4 (3.74)	23 (21.49)	16 (14.95)	43 (40.18)	0	87 (81.30)	20 (18.70)
Browntop millet	19 (17.75)	6 (5.60)	22 (20.56)	17 (15.88)	43 (40.18)	0	84 (78.50)	23 (21.50)
Foxtail millet	20 (18.69)	5 (4.67)	28 (26.16)	11 (10.28)	43 (40.18)	0	91 (85.04)	16 (14.96)
Little millet	22 (20.56)	3 (2.80)	34 (31.77)	05 (4.67)	43 (40.18)	0	99 (92.53)	8 (7.44)
Finger millet	20 (18.69)	5 (4.67)	25 (23.36)	14 (13.08)	43 (40.18)	0	88 (82.24)	19 (17.76)
Pearl millet	18 (16.82)	7 (6.54)	23 (21.49)	16 (14.95)	43 (40.18)	0	84 (78.50)	23 (21.50)

Quantity of seeds used for sowing and yields received by farmers in selected area

The quantity of seeds used for sowing and yields received are presented in Table 2. The millets grown by farmers were barnyard, kodo, proso and browntop millet and the requirement of seed for sowing were 2.5 kg, 2 kg, 3 kg, 3.5 kg per acre respectively. The quantity of seeds used for sowing in other millets like foxtail millet, little millet, finger millet and pearl millet for sowing was 3 kg, 3.5 kg 2.5 kg and 3 kg per acre respectively. The mean yields received by the farmers in barnyard millet, kodo millet, proso millet and browntop millet were 9.5 q, 9.5 q, 10 q and 8.5 q per acre respectively. The yields in other millets like foxtail millet, little millet, finger millet and pearl millet were 8 q, 9.5 q, 8.5 q and 8 q per acre respectively.

Table 2: Quantity of seeds used for sowing and yields received by farmers in selected area

Sl. No.	Millets cultivated	Seed quantity (kg/acre)	Average Yield (q/acre)
1	Barnyard millet	2.50	9.50
2	Kodo millet	2.00	9.50
3	Proso millet	3.00	10.00
4	Browntop millet	3.50	8.50
5	Foxtail millet	3.00	8.00
6	Little millet	3.50	9.50
7	Finger millet	2.50	8.50
8	Pearl millet	3.00	9.00

Consumption of millets by respondents in selected districts

Table 3 showed the consumption of millets by respondents in selected districts. The types of millets consumed by farmers were kodo millet, proso millet, barnyard millet and browntop millet. Among 107 farmers interviewed 64 (59.81%) consumed kodo millet, 66 (61.68%) each consumed proso and barnyard millet and 107 (100%) consumed browntop millet by Chitradurga, Davanagere and Tumukur districts. The

farmers consumed millet in the form of boiled rice and roti. The percentage of farmers 25 (23.36%) in Chitradurga consumed kodo millet, proso millet, barnyard millet and browntop millet in the form of boiled product (rice). The percentage of farmers 39 (36.45%) in Davanagere consumed kodo millet, proso millet, barnyard millet and browntop millet in the form of boiled product (rice). In Chitradurga and Davanagere farmers were not consumed other product (roti). Recently viz, from 3 years the farmers of this area started to use browntop millet in their diets and also for market purpose. In Hemindore village farmers were not consuming kodo millet, proso millet, barnyard millet and browntop millet in the form of boiled product (rice). In Tumukur farmers were consumed millet products in the form of 82 (76.63%) boiled product (rice) and 43 (40.18%) other product (roti). The farmers of Hemindore consumed only 25 (23.36%) browntop millet in the form of other product (roti). The farmers of Pavagada each consumed 2 (1.8%) of proso millet and barnyard millet and 18 (16.82%) browntop millet in the form of boiled product (rice). The farmers of Pavagada consumed 18 (16.82%) browntop millet in the form of other product (roti). However in Hemindore and Pavagada taluk of Tumkur district the farmers were using browntop millet as traditional food from the 50 years. The farmers of North Karnataka are using these millets in their diet and also marketing it through FPOs.

Farmers mainly preferred millet rice in their diet and the frequency of consumption of millet rice was once in month. Browntop millet was consumed daily in the form of roti by the farmers. Kodo millet, barnyard millet and browntop millet were consumed for once in month. Proso millet was consumed for once in week by the farmers. The farmers of Davanagere and Chitradurga consumed different millets in their diet. The consumption of browntop millet roti was seen in Hemindore village farmers and frequency of consumption of roti consumption was daily. Browntop millet roti was traditional food in Hemindore village.

Table 3: Consumption of millets by respondents in selected districts

N=107

Millets	Chitradurga (n=25)	Davanagere (n=39)	Tumkur u (n=43)		Total (n=107)	
	Mallihalli f (%)	Bhimanere f (%)	Hemindore f (%)	Pavagada f (%)	Cooked rice	Roti
Kodo millet Cooked rice	25 (23.36)	39 (36.44)	–	–	64 (59.81)	–
Proso millet Cooked rice	25 (23.36)	39 (36.44)	–	2 (1.86)	66 (61.68)	–
Barnyard millet Cooked rice	25 (23.36)	39 (36.44)	–	2 (1.86)	66 (61.68)	–
Browntop millet Cooked rice	25 (23.36)	39 (36.44)	–	18 (16.82)	82 (76.63)	–
Roti	–	–	25 (23.36)	18 (16.82)		43 (40.18)

Conclusion

The general information was collected from South Karnataka of Chitradurga district, Davanagere district and Tumkur district and the millets grown were barnyard millet, Kodo millet, Proso millet, Browntop millet, Foxtail millet, little millet, Finger millet and Pearl millet during kharif and rabi seasons. The types of millets consumed by farmers were kodo millet, proso millet, barnyard millet and browntop millet in the form of cooked rice and the farmers consume browntop millet in the form of roti and cooked rice.

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