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ज्वार समाचार
Jowar Samachar

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ज्वा.अनु.नि.
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In this issue....

Visit of Dr. S. Ayyappan, DG, ICAR to Rabi Sorghum Centre

Dr. S. Ayyappan, Hon'ble Director General, ICAR and Secretary DARE, GOI, visited Centre on Rabi Sorghum (DSR), Solapur on 26th September 2010. He was accompanied by Dr. HP Singh, Hon'ble DDG (Horticulture), ICAR, New Delhi, Dr. Dandin, VC, University of Horticulture, Bagalkot, Dr. Lawande, Director, Directorate of Onion and Garlic, Pune, Dr. Mehtre, Director of Research, MPKV, Rahuri and Dr. VT Jadhav, Director, NRC on Pomegranate, Solapur, among others. Dr. Ayyappan was received at CRS (DSR), Solapur by Dr. JV Patil, Director, DSR, Hyderabad. He briefed the Hon'ble DG and other visiting dignitaries on the progress and contribution of the centre for the development of rabi sorghum. He inspected the laboratory and field facilities available at the centre and visited the experimental farm. Dr. Ayyappan was explained the on-going research programmes by Dr. MS Raut, Officer in charge, CRS, Solapur. Other DSR scientists- Drs. AV Gadewar, Prabhakar and Chari Appaji interacted and explained their

Dr. S. Ayyappan, DG, ICAR, interacted with Director, DSR and CRS, Solapur Scientists

programmes. Later, addressing the scientists, Dr. Ayyappan expressed his happiness over the progress made by the centre and its impact. He expressed that there is no dearth of funds for research on rabi sorghum. He appreciated that the efforts being made by the scientists have led to considerable impact in terms of the increase in production and productivity of rabi sorghum in the country.

New Varieties of Rabi Sorghum for Maharashtra

Two new varieties of rabi sorghum were released for cultivation in Maharashtra during the Joint Agricultural Research and Development Committee Meeting-2010 of the SAUs of Maharashtra state at DBSKKV, Dapoli, Maharashtra.

Rabi sorghum variety Phule Revati

In irrigated areas, Phule Revati gave 4.6 tonnes/ha, which was 41.8% higher than CSV 18 (3.2 tonnes/ha), 21.4% over Phule Yashoda (3.78 tonnes/ha), 16.1% over Phule Vasudha (3.9 tonnes/ha), 35.2% over Maldandi (3.4 tonnes/ha), 19.8% over PKV Kranti (3.8 tonnes/ha) and 35.3% over Parbhani Moti (3.4 tonnes/ha). Its fodder yield in the areas tested

समाचार सारांश

रबी ज्वार केंद्र , सोलापुर में डॉ . एस अय्यपन्न , महानिदेशक , भा.कृ.अनु.प. का दौरा : डॉ. एस अय्यपन्न, माननीय महानिदेशक, भारतीय कृषि अनुसंधान परिषद तथा सचिव, कृषि अनुसंधान एवं शिक्षा विभाग, भारत सरकार ने 26 सितंबर 2010 को रबी ज्वार केंद्र (ज्वा.अनु.नि.) सोलापुर का दौरा किया । उन्होंने देश में ज्वार के उत्पादन व उत्पादकता को बढ़ाने हेतु वैज्ञानिकों द्वारा किए जा रहे प्रयासों की सराहना की।

महाराष्ट्र हेतु रबी ज्वार की नई किस्में : महात्मा फुले कृषि विद्यापीठ, राहुरी के द्वारा विकसित नई दो रबी ज्वार किस्मों का महाराष्ट्र में खेती के लिए वर्ष 2010 में लोकार्पण किया गया । पश्चिमी महाराष्ट्र में रबी के दौरान सिंचित क्षेत्रों में गहरी काली मृदा में खेती के लिए फुले रेवती (अनाज पैदावार 4.6 टन हेक्टर, तथा चारा पैदावार 11.5 टन हेक्टर) की सिफारिश की गई । महाराष्ट्र के वर्षा आधारित क्षेत्रों के लिए फुलें पंचमी कृषि जोपजाति की संस्तुती की गई । इसके दाने फुटेहरा (पॉपिंग) गुणवत्ता हेतु श्रेष्ठ थे ।

ज्वार की लवणता सहनशीलता में सुधार हेतु आनुवंशिक परिवर्तन : इस अध्ययन के द्वारा लवणता सहनशीलता में सुधार हेतु जीनप्ररुप एम 35-1 में परिवर्तन के लिए बायोलिस्टिक गन मेडिएटेड की दोनों पध्दतियों के द्वारा *पीसीएमआरपी* का उपयोग करके पारजीनी (ट्रांस्जेनिक) ज्वार का उत्पादन किया गया । टी$_2$ पीढ़ी की दो घटनाओं में लवणीय परिस्थितियों में बेहत्तर बीजअंकुरण (86%) के साथ एकल प्रति सन्निवेश तथा सकरात्मक आंकडे प्राप्त हुए ।

धान्य ज्वार में उपशाखा उत्परिवर्ती ऊतक संवर्धन : कृष्ट धान्य ज्वार में कई पीढ़ियों से उत्परिवर्ती ऊतक संवर्धन (सोमाक्लोनल) के द्वारा अत्यधिक महत्वपूर्ण स्थाई उपशाखन से उपशाखा उत्परिवर्तन का पता लगाया गया तथा कृषि विज्ञान विश्वविद्यालय, धारवाड़ में उसकी देखरेख की जा रही है।

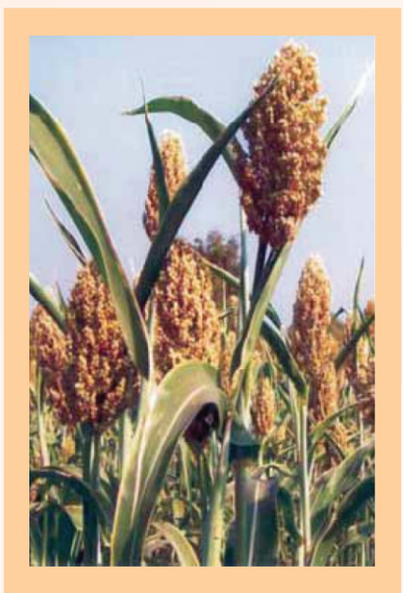
ज्वार में प्ररोह नाशीकीट प्रतिरोधी स्त्रोतों की आनुवंशिकी विविधता : आईएसएसआर चिह्नकों का उपयोग करके अतिसंवेदनशील तथा प्रतिरोधी वंशक्रमों में आनुवंशिक विविधता का पता लगाने के लिए अध्ययन किया गया । प्ररोह मक्खी स्त्रोतों में आईसीएसवी 705 अन्य तीन प्रतिरोधी स्त्रोतों (आईएस 18551, आईएस 2321 तथा आरएसई 03) से भिन्न है। इसी प्रकार तना छेदक प्रतिरोध हेतु आईसीएसवी 700 अन्य पैतृकों पर उपयोग किए जा सकने वाले आईएस 2205 तथा पीबी 15881 से भिन्न है।

धान्य ज्वार हेतु नए पुनःस्थापक वंशक्रम : अखिल भारतीय समन्वित ज्वार उन्नयन परियोजना केंद्र इंदौर ने वंशावली चयन पद्धति के द्वारा नए पुनःस्थापक विकसित किए हैं तथा प्रायोगिक संकरों के श्रेष्ठ नर पैतृक के रूप में पहचान की है। ये परिपक्वता तथा लंबाई में भिन्न-भिन्न हैं ।

हुर्डा हेतु ज्वार की जंगली क़िस्म : कर्नाटक के उत्तरी शुष्क क्षेत्र में कृषकों के द्वारा ज्वार की *रायसाहेब* किस्म की हुर्डा हेतु खेती की जाती है । *रायसाहेब* किस्म के अनाज की आसानी से गहाई कि जा सकती है तथा सीधे माइक्रोवेव अवन में भूना जा सकता है। जिससे भूने गर्म भुट्टों के हस्त-गहाई से बचा जा सकता है ।

अत्यधिक फुटेहरा (पॉप) की क्षमता युक्त ज्वार जननद्रव्य : कर्नाटक से एकत्र किए गए 50 फुटेहरा (पॉप) ज्वार जननद्रव्यों का फुटेहरा क्षमता हेतु मूल्यांकन किया गया । 73% बीज फुटेहरा रुप में परिवतित हो गए, जबकि 17% बीज फुटेहरा हेतु अक्षम थे । कुल 13 फुटेहर ज्वार जननद्रव्यों में 70% से अधिक फुटेहरा क्षमता देखी गई ।

- डॉ. महेश कुमार



Phule Revati

was 11.5 tonnes/ha which was 16.1% higher than CSV 18 (9.9 tonnes/ha), 15.9% over Phule Yashoda (9.9 tonnes/ha), 16.2% over Phule Vasudha (9.92 tonnes/ha), 20.6% over Maldandi (9.56 tonnes/ha), 16.5% over PKV Kranti (9.9 tonnes/ha) and 19.6% over Parbhani Moti (9.6 tonnes/ha). It has bold grains of pearly white colour and has better chapati-making quality. It is recommended for cultivation in irrigated areas during rabi on deep-black soils of western Maharashtra.

Rabi sorghum variety Phule Panchami

Sorghum cultivar Phule Panchami was found superior in grain-popping quality (87.4%) as compared to Khandesh Local 1 (14.2%) and Jabalpur Local 2 (54.4%). It has superior, extra large, whitish and fully opened pops compared to other checks. It was found tolerant to shoot fly and charcoal rot. It is recommended for release in rain-fed areas of Maharashtra.

Phule Panchami

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Genetic transformation of sorghum for improved salinity tolerance

Salinity is the most recurring problem in the arid and semi arid regions lowering the productivity of the crops such as sorghum. Attempts made so far to improve the salt tolerance in sorghum through conventional approaches have met with very limited success and therefore transgenic approach may be effective. This study reports the production of transgenic sorghum for improved salinity tolerance using *PcSrp* gene *via* biolistic gun mediated method of transformation. The M35-1 genotype of sorghum was used for transformation. The *PcSrp* (*Porteresia coarctata* serine rich protein) gene is known to impart salinity tolerance using ion homeostasis.

Sensitivity of sorghum shoot apice explants to sodium chloride stress was estimated by generating a kill curve. The shoot apice explants were growing healthier till 250 mM NaCl stress, above it started turning brown with bleaching symptoms and death of explants.

The *Actin* promoter controlled *PcSrp* gene containing vector pCAMBIA TG0063 was tried for biolistic gun transformation. The transformation efficiency was 0.71%. A 300 mM NaCl concentration was used for screening of the explants transformed with *PcSrp* gene.

Molecular study of the putatively transgenic plants confirmed 15 of 16 (93%) positive plants *via* PCR analysis and 13 of 15 (81%) positive plants *via* southern analysis in T_0 generation. In T_1 generation, all the events germinated on NaCl stress were showing positive band for PCR analysis and non-germinated events were not. Further, PCR and Southern analysis of the same events in T_2 generation resulted in confirmation of the two events stably expressing the *PcSrp* gene. Two events in T_2 generation resulted in single copy insertions and the data correlated positively with the germination test.

Seed germination study of T_1 transgenic plants using NaCl (200mM)

Event	Total no. of seeds tested	No. of seeds		χ^2
		Germinated	Non-germinated	
S1	44	38	6	3.03*
S2	48	35	13	0.11*
S3	48	32	16	1.77*
S4	24	14	10	3.55*
S5	48	12	36	64.00
S6	48	36	12	0.00*
S7	48	11	37	69.44
S8	32	27	5	1.50*
S9	48	36	12	0.00*
S10	48	45	3	9.00
S11	48	37	11	0.11*
S12	48	28	20	7.11
S13	48	46	2	11.11
S14	24	18	6	0.00*
S15	48	43	5	5.44

* Events following Mendelian ratio based Chi-square test: Chi-square value at 5%.

S6 event transgenic plants in T_2 generation showing germination in 250 mM NaCl solution

Screening of T_1 generation seeds for germination study under 200 mM NaCl stress resulted in 9 events segregating in Mendelian (3:1) ratio. The NaCl stress germinated seeds of the T_1 generation were again screened for germination test under 250 mM NaCl stress in culture boxes containing hydroponic solution. An average 86% of germination response was observed in the T_2 generation events.

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Axillary branched somaclonal mutant in grain sorghum

Crop domestication has often involved an increase in apical dominance, concentrating the resource in the main stem of the plant and a corresponding suppression of axillary branches. Although, the growth of lateral branches is affected by environmental conditions, their number and growth are genetically controlled in each plant species.

A somaclonal mutant of cultivated grain sorghum viz., *Sorghum bicolor* Axillary Branched Mutant (SbABM) with stable expression of significantly higher axillary branching over generations was identified and is being maintained at UAS, Dharwad. The mutant was derived from rabi sorghum variety A-1 through tissue culture in 1995. Normally one or two axillary branches are observed in sorghum depending on the moisture availability from the nodes just below the main earhead. In the mutant reported here, once the main head inflorescence emerges, simultaneously axillary branches initiate at nodes right from the lower most at hode root zone to the top nodes with earheads. However, the number of axillary branches varied from plant to plant. The earheads of the branches are smaller in size but the grain size is on par with the grain size of main earhead. Axillary branches with as high as 32 productive earheads have been observed. The earheads are semi-compact type unlike compact earhead in its parental check A-1.

The mutant is associated with desirable agronomic traits *viz*., early 50% flowering by a week compared to checks, A-1 and M 35-1 which is very critical for escape of terminal stress. The branches growing from each axillary bud alternating on either side of the plant helps this mutant to be lodging resistant. It was observed that the lodging percent in the mutant was less (44.2%) compared to in A-1 (82.6%) and in M35-1 (99.1%).

Plant with axillary branches

Axillary branching pattern

The mutant recorded terminal resistance (stay-green expression) and juicy stalk, while normal parent A-1 recorded high senescence and dry stalks. The test weight of the mutant was higher (4g/100 seeds) compared to its parental check, A-1 (3g/100 seeds) and grain quality features were on par with M 35-1.

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How diverse are our resistant sources for sorghum shoot pests?

Sorghum production in India has been enhanced through development of hybrids for *kharif* season. Male sterile lines like 27A and 296A are good combiners and formed the foundation for successful sorghum hybrid technology. Yields have reached a plateau and stabilization of these yields is feasible only through development of resistant lines to the key pests such as shootfly (*Atherigona soccata*) and stem borer (*Chilo partellus*). Resistance to shootfly is a complex polygenic character and depends on the interplay of a number of

Details of genotypes for study genetic diversity

S.No.	Genotype	Source	Specific trait
1	IS 18551	Ethiopia	Resistant source for shoot fly from germplasm
2	IS 2312	Sudan	Resistant source for shoot fly from germplasm
3	RSE 03	Rahuri, India	Resistant source for shoot fly
4	ICSV 705	ICRISAT	Improved resistant source for shoot fly
5	ICSV 700	ICRISAT	Improved resistance source for shootfly and stem borer
6	IS 2205	India	Resistant source for stem borer from germplasm
7	PB 15881-3	ICRISAT	Improved resistance source for stem borer
8	27 A	AICSIP, India	Female parent of the promising hybrid, CSH 16. Susceptible to both shoot fly and stem borer
9	296 A	AICSIP, India	Female parent of the promising hybrid, CSH 9. Susceptible to both shoot fly and stem borer
10	DJ 6514	—	Susceptible check for shoot fly and stem borer

componential characters like glossiness, seedling vigor, leaf wax and trichomes. Both shoot fly and stemborer attack the apical meristem by which a characteristic dead heart formation takes place leading to formation of less-productive tillers. These insects belong to different classes (Diptera and Lepidoptera), they lay their eggs on the leaves and the larvae attack the meristem, thus, the process and symptoms of the insect attack are common. Plant breeding programs are focusing to develop high yielding genotypes with promising levels of resistance to these important shoot pests. combined improvement of yield and resistance is possible only through understanding relatedness of resistance sources and elite material and divergence among the resistant sources used in design of plant breeding programs.

Objective of the present investigation was to find the genetic distance of the elite parental lines with susceptible and resistant lines using ISSR markers. We have used two male sterile parental lines, 27A and 296A, since these lines are used directly in hybrid seed production.

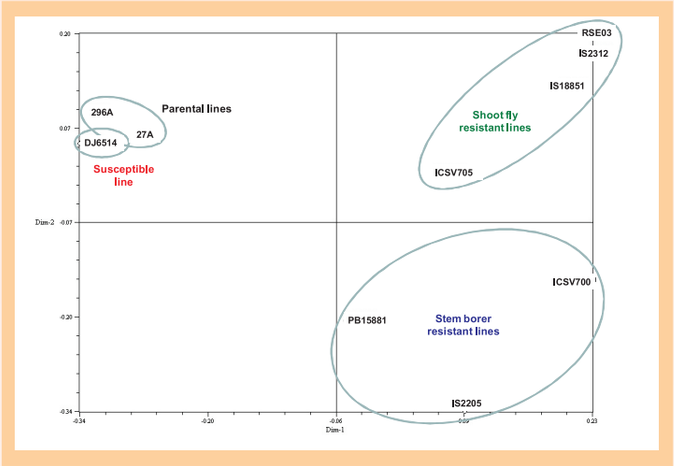
The experimental material consists of a set of 10 sorghum genotypes. These include 4 resistant sources for shoot fly (IS18551, IS2312, RSE03, and ICSV705), 3 resistant sources for stem borer (IS2205, ICSV700, and PB15881-3), 2 elite lines, 296A and 27A, and DJ6514, which is a susceptible check for both shoot fly and stemborer. Plant material was grown in field and fresh leaf samples were collected in ice from 21- 45 d old plants. DNA was extracted and DNA amplifications were performed using 40 ISSR primers.

Among 40 ISSR primers tested, 26 amplified and 14 did not. In all, 715 ISSR bands were scored at 151 band positions in the genotypes tested. Primers having dinucleotide repeats generated 6 loci on an average which was slightly higher than the 5.2 loci generated by those which had trinucleotide repeats. Taken together, among the primers with single nucleotide as overhang $(AC)_n$ based primers produced the highest number of bands (mean 8) whereas $(CT)_n$ based primers produced the least (mean 3). Among the primers with dinucleotides as overhang $(TG)_n$ based primers produced more number of bandsz (mean 6.3) and $(TC)_n$ based primers generated the least (mean 4.7).

Mean PIC value of all 26 primers was 0.68. Primers with dinucleotide repeats detected a higher level of polymorphism than those with single nucleotide repeats. $(AC)_n$ based primers showed the highest PIC value (0.88) as compared to the lowest PIC value of $(CA)_n$ based primers (0.58). Mean Rp value for 26 primers were 5.4. Both the parental lines (296A and 27A) and the susceptible genotype DJ6514 showed the lowest amplification. Among the genotypes studied, total number of bands per accession was more for the genotype ICSV 700 (92) whereas it was least for DJ 6514 (35).

Genetic diversity was analysed using principal component analysis. Principal component analysis separated the 10 genotypes into two clusters by first and second principle components, which represented 32% and 24% of the diversity in the sample. The first one was tightly clustered, whereas the

second one was loosely clustered. The tight cluster included three genotypes (296A, 27A and DJ6514) whereas the loose cluster included four genotypes (RSE03, IS2312, IS18551 and ICSV705) all resistant sources for shoot fly. The remaining three genotypes, which were the resistant sources for stem borer (Pb158813, IS2205 and ICSV700) were scattered.



Clustering of genotypes using principal component analysis

Though the source of origin of the two shoot fly resistant genotypes is wide apart, as IS18551 from Ethiopia and IS2312 from Sudan, they were very closely clustered. Genotype RSE03 which is also a shoot fly resistant source, but from India, was grouped slightly away from IS 18551 and IS 2312. Phenotype evaluation of these resistant sources also showed that RSE03 is diverse from the resistant sources from germplasm. In the other major group, genotypes 27A and 296A, which are susceptible to both shoot fly and stem borer were clustered together with DJ6514, a susceptible genotype for shoot fly and stem borer.

Lack of significant progress in the past for resistance breeding to shootfly can be attributed to the use of closely related resistant sources such as IS18551 and IS2312, in breeding programs. For developing sorghum hybrids with resistance, it is important to develop resistant male and female parents. Among the shoot fly resistant sources ICSV705 was diverse from the other 3 resistant sources (IS18551, IS2312 and RSE03). Therefore, it can be used as source for resistance in one parent (either male or female) and IS18551, IS2312 and RSE03 can be used for improvement of resistance in the other parent. Similarly, for incorporating resistance against stemborer, ICSV700 can be used on one parental side while IS2205 or PB15881 can be used on the other parent.

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New restorer lines for grain sorghum

Restorer Lines which restore the fertility of male sterile line are complementary to CMS lines for exploitation of hybrid vigour. AICSIP Indore centre has developed new restorers through pedigree selection method and identified as superior male parent of experimental hybrids. A total of 22 new restorers including established male parents were evaluated in replicated trials during 2008 and 2009 at College of Agriculture Research Farm, Indore during kharif season. Among them, I-28, I-26, I-27 and I-29 were found promising. These are in different maturity and height groups.

New restorer lines for grain sorghum

Restorer	Pedigree	Specific traits
I-27	(SPV 1333 x RS 673) x (IS 73210 x SPV 1428)	medium in maturity with pearly white, attractive and medium bold grains
I-28	SPV 1489 x RS673	medium to late to flower (80 days) and medium to tall height (220cm)
I-26	SPV 1333 x RS 673	flowers in 78 days with medium in height
I-29	IS 22557 x I-12	flowers in 78 days having 150 cm height

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Sorghum landrace variety for hurda

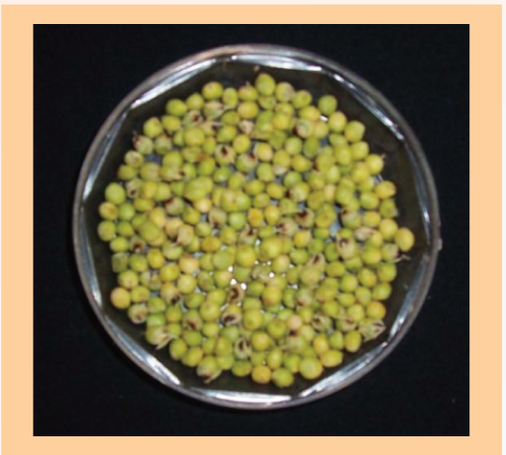
Sorghum is the staple cereal of Northern dry zone of Karnataka. Farmers of this region have identified special varieties suitable for specific food preparations. One of such varieties identified was *seetani jola* of rabi sorghum with sweet and soft grains used traditionally for preparation of *seetani*/hurda (roasted tender grains). *Raosaheb* is one such

variety being cultivated by the farmers for hurda purpose. Normally hurda is prepared by roasting the tender panicle harvested at milky grain stage in trench using fire. *Seetani* is generally relished with jaggery, coarsely ground peanut chutney powder and salt. There is notion among elders that eating *seetani* for one month keeps the body healthier for whole year.

Raosaheb is a selection from farmer's fields in Masabinal village of Bijapur District and collection was made by sorghum scientists of AICSIP centre, Bijapur during 2002. It is medium tall, having compact earhead and grains green at milky stage. *Raosaheb* possesses slightly bolder seeds compared to *Sakkari Mukkari Jola,* a sweet grain variety. The hand threshed grains of the *Raosaheb* and other varieties were roasted in different methods like traditional, microoven and microwave and were subjected for sensory evaluation and parametric observations like threshability (%), moisture (%) and grain yield per head (g). The qualitative parameters that were recorded visually and upon sensory evaluation in microwave revealed that the roasted grains of *Raosaheb* were medium sized, sweet, tasty and with excellent aroma. The roasted grains were soft with attractive green colour. It was noticed that the green colouration in *Raosaheb* was retained even after drying. *Raosaheb* recorded higher moisture (%) in grains before roasting (54.7%) and after roasting (49%-53.8% across different methods) compared to M 35-1 (52.2% and 29.5%-45.9% before and after roasting, respectively).

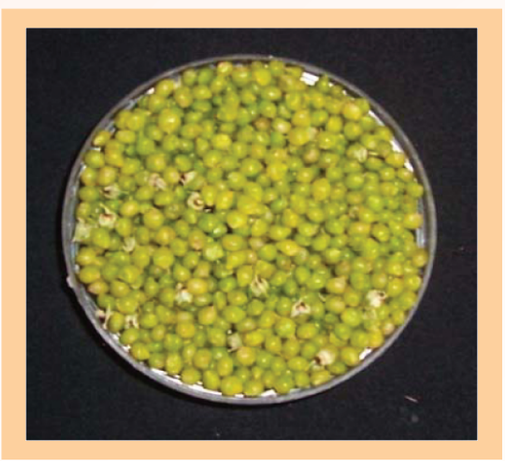
Panicle of Raosaheb at milky stage

The evaluation for threshability revealed higher percentage (60.9%) of threshability (before roasting) in *Raosaheb* compared to *Sakkari Mukkari Jola* (52.5%). Similar trend was observed for grain yield per panicle (before roasting) due to bold grains of *Raosaheb*. The roasted grain yield per panicle in Raosaheb (52.3-67.4 g) was comparable with *Sakkari Mukkari Jola* (55.9-63.9 g) and higher than M35-1 when roasted in different methods.



Tender grains separated (before roasting)

The high threshed grain yield (raw fresh) of *Raosaheb* compared to *Sakkari mukkari Jola* and its comparative high threshability before and after roasting indicates that *Raosaheb* variety can be threshed easily in raw stage itself and roasted directly in microwave thus avoiding the burden of hand threshing of roasted panicle when hot.



Hurda grains roasted in microwave

Hence, *Raosaheb* variety is suitable for commercial exploitation. The roasted grains after drying can be utilized for variety of tasty food items like *chat, soup, guggari, sandige* etc. The specific grain quality trait of this variety for hurda preparation needs to be exploited commercially to add value to the grain, thus benefiting farmers and the consumers.

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Potential high-popping sorghum germplasm

Sorghum can be used for diverse purposes. Pop sorghum is a potential candidate for commercial use of sorghum. In some parts of South India and in Ethiopia, sorghum grains are popped and used on special occasions and festivals. Pop type of sorghum grains are well suited for popping owing to tenderness and less hull. The process of popping also increases the digestibility. Since pop sorghum has economical as well as nutritional values, there is a need to exploit it commercially while conserving the rich native diversity. Central India being the major sorghum growing area has large and diverse plant types of pop sorghum. Many of these cultivars have been collected, multiplied and studied for their popping qualities, similar to that of rice and maize. Some of these cultivars have also been grown on saline and alkaline soil situations. In this study, a replicated set of 50 pop sorghum germplasm collected from Karnataka was evaluated for the popping ability. The number of seeds used for popping, popped seed, un-popped seed and its popping percentage were analysed. The popped seed was observed as 73% and un-popped as 17%.

A total of 13 pop sorghum germplasm viz., POP 16 (IC 308651), POP 31(IC 308660), POP 32 (IC 308661), POP 37 (IC 308664), POP 38 (IC 308665), POP 47(IC 308671), POP 49 (IC 308673), POP 50 (IC 308674), POP 54 (IC 308678), POP 58 (IC 308682), POP 59 (IC 308683), POP 60 (IC 308684), and POP 62 (IC 308685) were identified with more than 70 percent popping ability.

Potential pop germplasm identified

Accession	Seed taken (g)	Popped taken weight(g)	un popped seed weight (g)	100% Popped Popped	100% un
IC - 308651	20.0	13.65	3.48	68.28	17.40
IC - 308660	25.0	17.43	4.20	69.70	16.78
IC - 308661	25.0	17.94	4.05	71.76	16.20
IC - 308664	25.0	17.07	5.14	68.28	20.54
IC - 308665	25.0	18.00	4.06	72.00	16.22
IC - 308671	25.0	18.30	2.69	73.20	10.74
IC - 308673	25.0	18.44	4.28	73.74	17.10
IC - 308674	25.0	18.68	4.18	74.72	16.72
IC - 308678	25.0	18.04	5.25	72.14	29.00
IC - 308682	20.0	14.84	2.90	74.18	14.50
IC - 308683	25.0	17.97	4.59	71.86	18.36
IC - 308684	24.0	18.88	2.89	78.65	12.02
IC - 308685	25.0	18.55	4.63	72.12	17.67
Mean	24.2	17.52	4.02	72.36	17.18
SD	1.8	1.53	0.87	3.01	4.43
CV (%)	7.41	8.73	21.42	4.16	25.7

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