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SHORT COMMUNICATION

Gur Quality of Some Sugarcane Varieties Cultivated under Flood Stress Condition at Chunarughat

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Sugarcane is a cash-cum-industrial crop plays a significant role in economy of Bangladesh. Among sugarcane growing countries of the world position of Bangladesh is sixteenth in respect of cultivable area and twenty-first in respect of cane production. Sugarcane occupies 2.03 per cent of net cropped area (Anon., 2005). Sugarcane (*Saccharum officinarum L*) is the main source of raw material for production of gur in Bangladesh. In Akhaura Terrace Soils sugarcane cultivation is generally practiced for gur production purposes. Farmers of this region grow local varieties since long back. So gur yield and economic return from sugarcane cultivation is very low. Moreover, there is no other suitable variety that could be used as an alternate to replace local varieties. It is considerable BSRI newly released varieties may not perform equally well in all locations for replacing old varieties. It is, therefore, important to evaluate sugarcane varieties suitable for this area for sustainable sugarcane production and to ensure sugarcane supply to the gur makers (Rashid *et al.* 2001). In Bangladesh yield of cane per unit area is the lowest in the world (Hossain, 1991).

Gur is manufactured almost in all parts of Bangladesh where sugarcane is grown in abundance. Selection of sugarcane varieties suitable for quality gur production is important. Varieties suitable for gur making are found to be equally good for sugar production. However, a variety suitable for sugar production may not be equally suitable for gur making (Singh *et al.*, 1975). Gur quality is considered by its sucrose content, reducing sugars, colour etc. (Gopal and Chiranjivi, 1959). Though quality of gur may further be modified by method of boiling and clarificants used for gur preparation. Chemical composition of gur and its quality depends on composition of juice and varieties from which gur is made. The quality of gur may be influenced by climate, soil type, crop management, clarificants used, stage of maturity at harvest and method of juice boiling adopted but mainly depends upon the variety from which it is made (Kapur *et al.*, 1988). There are wide variations in quality chemical composition, colour, reducing sugars of gur prepared from different varieties and deterioration during storage (Patil *et al.*, 1994). Considering the fact, an experiment were undertaken in the farmer's field of Akhaura Terrace Soils with four modern highly flood tolerant varieties to evaluate the performance of modern varieties for quality gur production.

The experiment was conducted at Chunarughat, Hobiganj during 2007-2009 cropping season in three replications. The experiment included four sugarcane varieties, Isd 33, Isd 36, Isd 37, Isd 38 with a local variety as standard. The crop was harvested in December. Cane samples were collected from each plots and crushed for gur production. After harvesting gur was prepared from each variety along with control varieties separately. Gur yield was also calculated and sucrose % gur, reducing sugars % gur, colour transmittance of gur, pH of gur and moisture % gur were studied after two days of its preparation. Gur was prepared after harvest by simple open pan boiling method without chemical clarificant. Chemical properties of prepared gur from varieties for colour (at 0.25N solution), sucrose, reducing sugars, pH and moisture % were determined by following method (Roy, 1954). Data on gur yield, sucrose % gur, reducing sugars % gur, colour of gur, pH of gur and moisture % gur from same varieties were recorded. Recorded data have been presented graphically for discussion.

The varieties tested were found different in gur yield. Gur prepared from four varieties including one local standard variety have been chemically analyzed in the month of December. Results have been shown in Figures 1 to 6. Significantly higher gur yield 11.8 t ha^{-1} and 11.1 tha^{-1} were obtained from the varieties Isd 37 and Isd 36 respectively compared to the rest varieties (Fig 1). The higher gur yield was obtained from the varieties Isd 37 and Isd 36 might be due to its higher Brix percentage and cane yield. Significantly higher Brix percentage and higher cane yield contributes to higher gur production (Singh *et al.*, 1999). The colour transmittance of gur is shown in the Figure 2. It is seen that the highest colour transmittance of gur was obtained from the variety Isd 36 (67.0) followed by Isd 38 (66.0) and Isd 37 (63.0). The lowest colour transmittance was obtained in the variety Isd 33 (45.0). It is evident from the data that colour transmittance of gur prepared from the varieties Isd 36, Isd 38 and Isd 37 were comparatively highest value. Similar findings were also reported by Sarker *et al.* (1985) that light coloured gur is always preferred by consumers for eating purpose and good quality gur is characterized by light colour.

The highest sucrose % gur was recorded from the variety Isd 36 (77.6%) which was statistical similar with the variety Isd 37 (74.8%) and Isd 38 (71.4%) and the lowest in variety Isd 33 (Fig. 3). It may be stated that sucrose per cent being the main sweetening factor of gur. Reducing sugars per cent of gur of the variety Isd 36 (7.8%), Isd 38 (8.1%) and Isd 37 (8.8%) were found to be lower than those of other varieties (Fig. 4). Results agree with results obtained by Jabber *et al.* (2005) who reported that a good quality gur should have higher sucrose and lower reducing sugars per cent. Gur containing higher per cent of reducing sugars generally hygroscopic in nature and low shelf-life and ultimately poor quality. There was no significant difference pH of prepared gur from all the varieties. Lower pH indicates acidic in nature. Figure 5 shows that the highest pH value of gur prepared from the varieties Isd 37 (5.63) followed by Isd 38 (5.62) and Isd 36 (5.52) respectively which is equivalent to other varieties, and gur from these types varieties are suitable for consumption. Figure 6 shows that Isd 33 (7.7%) and local variety (7.5%) have the highest moisture per cent and the lowest moisture% obtained from the varieties Isd 36 (5.3%), Isd 38 (5.4%) and Isd 37 (5.7%). Higher percentage of moisture containing gur is not suitable for long term preservation (Gaur *et al.*, 1979).

Depending on results, it may be stated that superior quality of gur associated with higher sucrose, high colour transmittance, lower reducing sugars content and low moisture. The proper distribution of these in juice is essential for producing good quality gur with standard keeping quality. It may be concluded that the varieties Isd 36, Isd 37 and Isd 38 may be considered suitable for quality gur production under flood stress condition at Chunarughat areas.

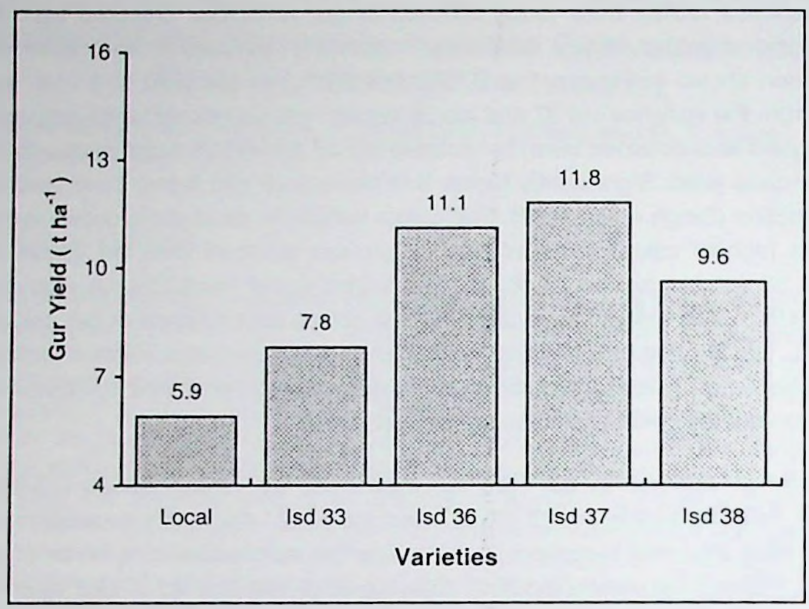

Figure 1 : Gur Yield (TCH) (Mean of 2 seasons)

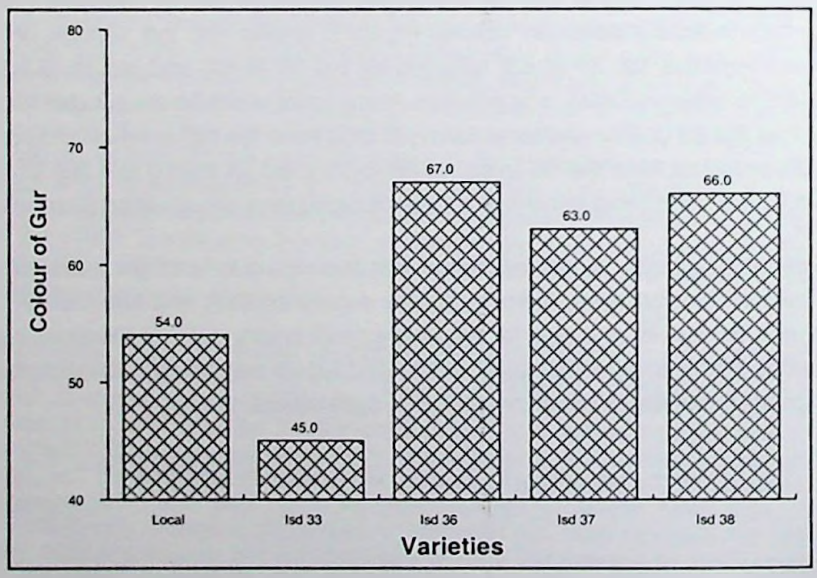

Figure 2 : Colour Transmittance of gur (Mean of 2 seasons)

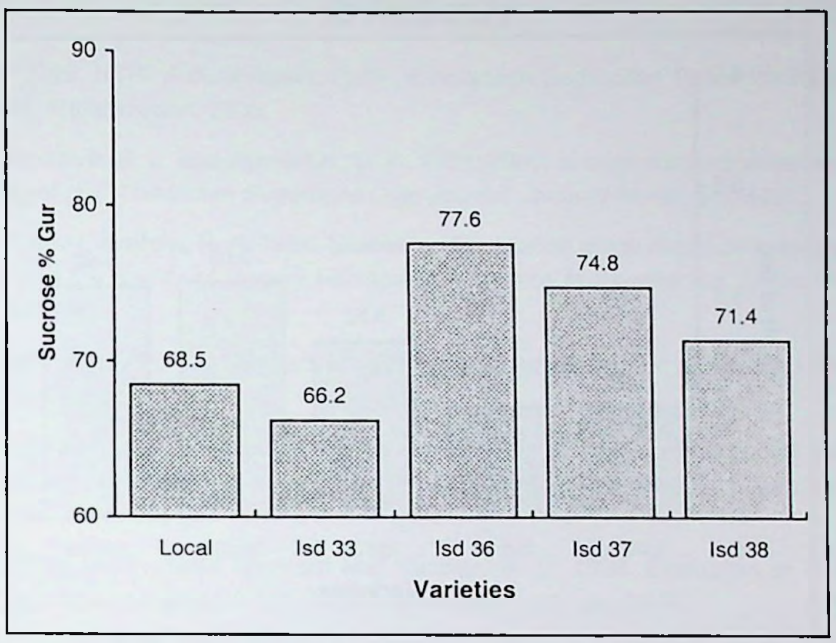

Figure 3 : Sucrose % in Gur (Mean of 2 seasons)

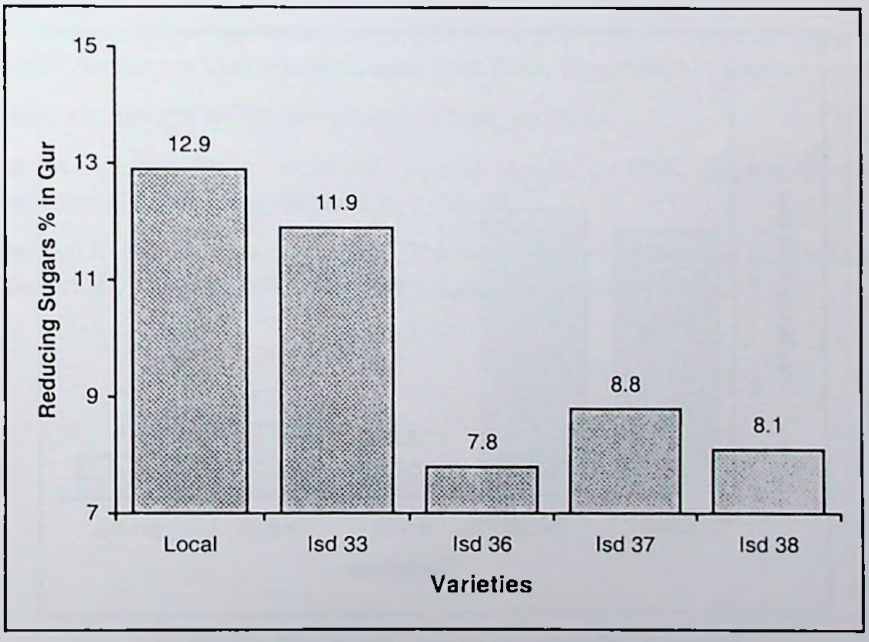

Figure 4 : Reducing Sugars % in gur (Mean of 2 seasons)

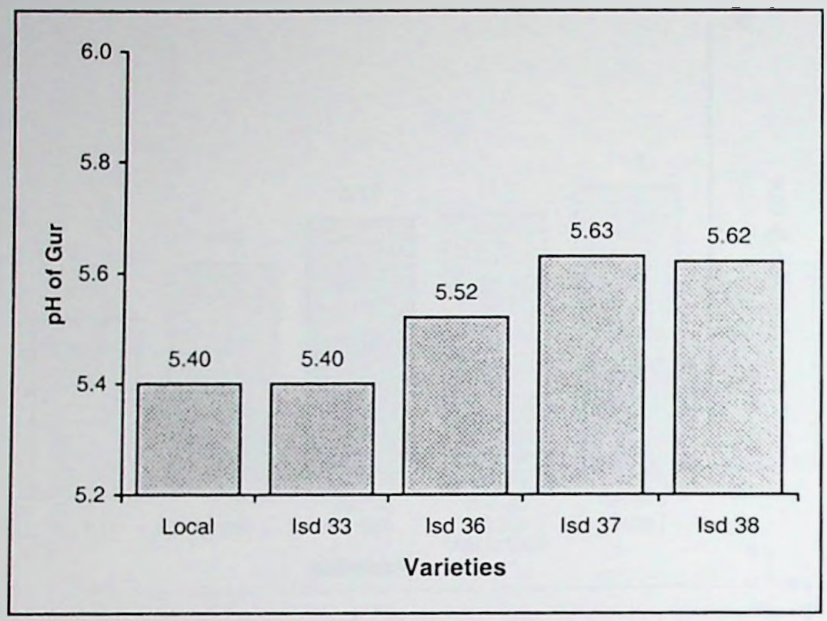

Figure 5 : pH of gur (Mean of 2 seasons)

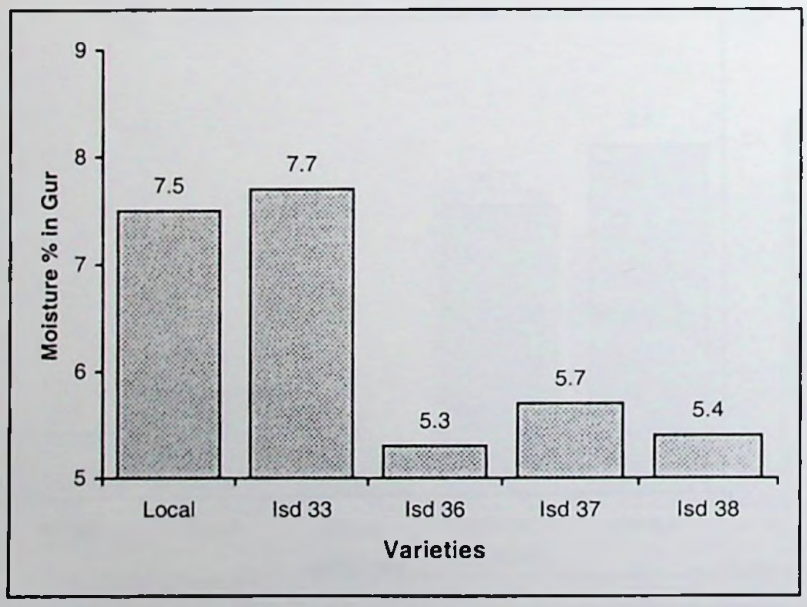

Figure 6 : Moisture % in gur (Mean of 2 seasons)

REFERENCES

Annonymous, 2005. BSRI Annual report. 2005. Bangladesh Sugarcane Research Institute, Ishurdi, Pabna, Annual report, 2005.

Gaur, S. L.; Ranadive, S. L. and Jawalekar, D. V. 1979. Effect of sugarcane varieties on the keeping quality of gur. *The Indian Sugarcane Crop Journal*, January-March, pp18-20.

Gopal, A. K. V. and Chiranjivi, R. K. 1959. Studies on the relation of the chemical composition of cane juice and the quality of jaggery with special reference to the new Co. canes. *Proc. ISSCT.*, **10** : 825-828.

Hossain, M. 1991. Agriculture in Bangladesh, performance, problems and prospects. University press limited, Dhaka.

Jabber, M. A.; Ghafur, M. A.; Begum, M. K. and Arefin, M. S. 2005. Maturity status of New Promising Sugarcane Genotypes and Evaluation for Gur Quality. *Bangladesh J. Sugarcane*, **24-27**: 41-46

Kapur, J.; Sharma, K. P.; Bala Kanchan and Kanwar, R. S. 1988. Evaluation of New Promising Sugarcane Genotypes for Gur Quality. *Bharatiya Sugar*, pp. 69-70.

Patil, J. P and Single, A. K. 1994. Effect of potassium fertilization and sugarcane varieties on quality of Jaggery. *Indian Sugar*, **32** : 277-397.

Rashid, M.H; Quddus, M.A. Rashid, M.A. and Elahi, N.E 2001. Performance of modern sugarcane varieties for gur production in Modhupur Tract Soils. *Bangladesh J. Sugarcane*, **23**: 57-60.

Roy, S. C. 1954. Monograph on the gur industry of India, pp 55-64.

Sarker, M. A. A.; Jabber, M. A.; Alam, M. R. and Hoque, J. 1985. Sugarcane variety for gur production. *Bangladesh J. Sugarcane*, **7** : 76-78.

Singh, B.; Sareen, K. and Sharma, H. L. 1975. The study of physico-chemical factors for grading Gur of Sugarcane varieties in Punjab. *Indian Sugar*, **24** : 947-949.