https://doi.org/10.29321/MAJ.10.A01961
Madras Agric. J.77, (9-12), 349-350 (1990)

INHERITANCE OF SCENT IN SOME RICE CULTIVARS

V.N.SAHU and R.K.SAHU
Indira Gandhi Agricultural University,
Raipur, Madhya Pradesh

ABSTRACT

Inheritance of scent was studied in native cultivars Kalimooch 64 and Kadamphool and the improved variety Pusa 33. A single recessive gene conferred scentedness in native cultivars, whereas two recessive and one dominant genes were responsible for scent in Pusa 33.

KEY WORDS : Rice, Scentedness, Inheritance.

Scented rice fetches premium price not only due to its aroma, but also due to excellent cooking quality and taste. Among the 100 native scented rice collections in germplasm at Raipur (M.P.), Kalimooch 64 and Kadamphool are the high yielders, resistant to drought and have field resistance to several pests and diseases. Very little information is available regarding genetics of scent. Therefore nature of inheritance for scent was studied in some rice cultivars.

MATERIALS AND METHODS

The native (Kalimooch 64 and Kadamphool) and one improved (Pusa 33) scented cultivars were crossed with non-scented improved varieties Taichung Native 1 or Cul 245. The scented cultivars were used as male parent. The scent was indentified by the modified leaf analysis technique adopted by Singh *et al.* (1986). The technique consisted collecting flag leaf and treating with O.1 N KOH in petridishes and scent was detected by smelling 10 to 20 minutes after the alkali treatment.

RESULTS AND DISCUSSION

The reaction of F_1 and F_2 progenies are presented in Table 1. The F_1 progenies from the crosses of Taichung Native 1/ Kalimooch 64 and Cul 245/Kadamphool were non scented, thereby indicating the recessive nature of scent in these cultivars. The F_2 populations from these crosses segregated in the ratio of one scented to three nonscented plants, indicating thereby that single recessive gene conditions scent in Kalimooch 64 and Kadamphool. However the F_1 plants of Cul 245/Pusa 33 were scented and proportion of scented and nonscented plants in F_2 populations of this cross agreed closely to the trigenic 27:37 ratio expected for independent segregation of one dominant and two recessive genes. Ramaiah (1953) has also quoted similar observations. However other ratios (scented to nonscented) like 3:1, 9:7, 13:3 and 15:1 have also been quoted by Ramiah (1953) and Dhulappanvar and Mensinkai (1969). Tripathi and Rao (1979), Nagaraju *et al.* (1975) and Dhulappanavar (1976) have reported 2,3 and 4 (respectively)

Table 1. Inheritance of scent in some rice cultivars

Cross	F_1	F_2			
		Scented	Non-scented	X2 1:3/ 27:37	P value
T.N. 1/Kalimooch 64	Non-scented	81	226	0.30	0.5 - 0.7
Cul 245/Kadamphool	Non-scented	68	189	0.28	0.5 - 0.7
Cul 245/Pusa 33	Scented	164	259	2.02	0.1 - 0.2

complementary genes responsible for scentedness. Richharia *et al.* (1965) reported that scentedness is a polygenic character.

Variation in ratios of scented to nonscented observed may be due to difficulty in scoring methods, because it completely depends on the individuals inhaling capacity. Clear indications are for major gene control for scentedness. These major genes can very easily be incorporated into improved breeding lines.

ACKNOWLEDGEMENT

Kind facilities by Dr. M.N. Shrivastava in various aspects of this study are gratefully acknowledged.

REFERENCES

DHULAPPANAVAR, C.V. and MENSINKAI, S.W. 1969. Inheritance of scent in rice. **Karnataka Univ. J., 14:** 125-129.

DHULAPPANAVAR, C.V. 1976. Inheritance of scent in rice. **Euphytica., 25:** 659-662.

NAGARAJU, M. CHOUDHARY, D. and RAO, M.J.B.K. 1975. A simple technique to identify scent in rice and inheritance pattern in scent. **Curr. Sci., 44:** 599.

RAMAIAH, K. 1953. **Rice Breeding and Genetics. ICAR Monograph.** p360.

RICHHARIA, R.H., MISRO, B. and KULKARNI, V.A. 1965. Studies in the world genetic stock of rice, IV. Distribution of scented rices. **Oryza., 2:** 57-59.

SINGH, V., BHATTACHARYA, K.R., and MAHADEVAPPA, M. 1986. A reliable test for the identification of scented rice. **Oryza., 23:** 249-251.

TRIPATHI, R.S. and RAO, M.J.K. 1979. Inheritance and linkage relationship of scent in rice. **Euphytica., 28:** 319-323.

Madras Agric. J.77, (9-12): 350-355 (1990)

STUDY ON COMBINING ABILITY IN HYBRID RICE (Oryza sativa L.)*

K. NILAKANTA PILLAI and T.K. RAMACHANDRAN

ABSTRACT

Among the lines, ZS 97 A possessed high gca effects for number of productive tillers per plant, number of filled grains per panicle, 100 grain weight, grain yield and straw yield per plant. Among the testers, IR 50 possessed high gca effects for days to panicle emergence, number of productive tillers per plant, number of spikelets per panicle, number of filled grains per panicle, grain yield and straw yield per plant. Among the hybrids in general, ZS 97A/IR 50 expressed high order of expression for the characters viz, total spikelets per panicle, number of filled grains per panicle and grain yield per plant. This high order of expression might be due to the additive genetic effects present in both the parents.

Key Words : Rice, Combining ability

Recent achievement in rice breeding is the development of hybrid rice in China. Hybrid rice came into cultivation from 1976 and 1984. The area has been increased to 25 per cent of total cultivated area of 33 million hectares (Yuan and Virmani, 1986). Hybrid rice has 25 to 30 per cent increased yield over locally adapted varieties in China. The disadvantage of Chinese hybrids is that they do not perform well under Indian conditions on account of varied agro climatic conditions and hence

* Part of M.Sc., (Ag) Thesis submitted by the first author to the TNAU, Coimbatore - 641 003

Present Address : 1. Assistant Professor (Breeding), TNAU, Coimbatore
2. Professor and Head, Coconut Research Station, Veppankulam, Thanjavur District