

Inheritance of flower colour and siliqua position in *Brassica rapa* spp. *yellow sarson*

■ SURENDRA SINGH, D.P. PANT AND NITIN KUMAR

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In plants morphological markers are visible markers to trace out linked traits, which are useful for a plant breeder. Morphological markers are required to select the desirable characters for improvement of a crop. Among the major crops of the rapeseed groups yellow sarson (*Brassica rapa* spp. *yellow sarson*) has yellow seed coat colour, leads higher fibre content in the meal. Meal with higher fibre content is nutritious for animal consumption. However, oil with optimum fatty acid profile is nutritious for health but in *Brassica rapa* spp. *yellow sarson* oil is considered inferior in quality in most other vegetable oils as it contain very high amounts of undesirable long chain fatty acids like eicosenoic acid and erucic acid. Identification of desirable fatty acid composition at early stage will help breeder to isolate elite genotype for development of quality variety in Brassica. Flower colour in *Brassica rapa* generally is yellow/pale and rarely white (Sachan *et al.*, 2007 and Rahman *et al.*, 2001) investigated that white flower colour is linked with an erucic acid allele in *Brassica rapa*, which can be used as a morphological marker to select lines within desirable erucic

acid in oil for breeding programme.

Present investigation was carried out to study the inheritance of flower colour and siliqua position in *Brassica rapa* spp. *yellow sarson*. During 2010-11 six strains viz., NDYS-2018, NDYS-123 and Ragini with yellow flower colour were crossed with two PYS-7 and PYS 2007-7 having white flower and in the same experiment the cross was made between NDYS-123 upright siliqua positions with PYS-1 droopy type siliqua position. The F₁ and F₂ generations of four crosses were obtained in the flowering year. F₁ progenies of all these crosses were grown during 2011-12. At flowering each plant were observed carefully to record the observation on flower colour and siliqua position. In F₁ ten randomly selected plants from each cross were bagged with muslin cloth bag to avoid out crossing and produce generally pure F₂ seeds. These F₂ seeds were sown in the large plot to record observations on flower colour and siliqua position.

The expression of yellow colour in F₁ plants of three crosses between five strains viz., NDYS-2018, NDYS-123 and Ragini with yellow flower colour was crossed to two PYS-7 and PYS 2007-7, with white flour colour expressed complete dominance of yellow colour over white colour. In F₂ generation, each plant was screened for flower colour. In the cross NDYS-2018 x PYS-2007-7, out of 325 plants, 255 had yellow flower and 70 plants with white flowers in the cross PYS-7 x NDYS-123, out of 266 plants 190 had yellow flower and 76 plants with white flowers in the cross NDYS-2018 x Ragini, out of 200 plants 151 had yellow flower and 49 plants with white flowers. In case of inheritance of siliqua position the F₁ plants between PYS-7 x NDYS-2018

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Author to be contacted :

SURENDRA SINGH, Department of Genetics and Plant Breeding, G. B. Pant University of Agriculture and Technology, Pantnagar, UDHAM SINGH NAGAR (UTTARAKHAND) INDIA
Email: autumcsa@gmail.com

Address of the Co-authors:

D.P. PANT AND NITIN KUMAR, Department of Genetics and Plant Breeding, G. B. Pant University of Agriculture and Technology, Pantnagar, UDHAM SINGH NAGAR (UTTARAKHAND) INDIA

Table 1: Chi-square values in F₂ population of the three crosses for flower colour in *B. rapa* ssp. *yellow sarson*

Cross (F ₂ generation)	Total plants	Plants with yellow flower	Plants with white flower	Expected ratio (yellow : white flower)	Value of x ²	probability
NDYS-2018 x PYS-2007-7	325	255	70	3:1	2.077	0.1-0.05
PYS-7 x NDYS-123	266	109	76	3:1	1.357	0.1-0.05
NDYS-2018 x Ragini	200	151	49	3:1	.026	0.1-0.05

Table 2: Chi-square value in F₂ population of cross for siliqua position *B. rapa* ssp. *yellow sarson*

Cross (F ₂ generation)	Total plants	Plants with upright siliqua	Plants with droopy siliqua	Expected ratio (upright : droopy siliqua)	Value of x ²	probability
PYS-7 x NDYS-2018	389	383	6	3 : 1	114.16	0.05

expressed complete dominance for upright siliqua position. In F₂ generation each plant screened for siliqua position. In the cross PYS-7 x NDYS-2018, out of 389 plants 383 had upright type siliqua and 6 plants with droopy type siliqua position. Above segregation of all the three crosses for flower colour and one cross for siliqua position in F₂ generation, were tested with Chi-square test. Chi-square value for first cross (NDYS-2018 x Pys-2007-7) was 2.077, which were non-significant at 0.1-0.05 probability, gave a goodness of fit of an expected monogenic ratio of 3 yellow: 1 white. Same result was obtained in rest of the two crosses (Table 1). In case of inheritance of siliqua position the Chi-square value for cross PYS-7 x NDYS-2018 was 114.16 which were significant against 0.05 probabilities then Null hypothesis is accepted and given ratio not according to expected monogenic 3 upright: 1 droopy siliqua position (Table 2).

Thus, it is concluded that white flower colour in *B. rapa* spp. *yellow sarson* is a recessive monogenic traits and the siliqua position polygenic traits. Rahman (2001) also

reported that petal colour is monogenic and yellow petal colour gene is dominant over the creamy white petal colour gene in *brassica rapa* spp. *yellow sarson*. Sachan *et al.* (2007) also reported flower colour is monogenic and yellow colour flower gene dominant over the white colour flower gene in *Brassica rapa* spp. *yellow sarson*.

REFERENCES

- Rahman, M.H. (2001). Inheritance of petal colour and its independent segregation from seed colour in *Brassica rapa*. *Plant Breed.*, **120** (3): 197.
- Rahman, M.H., Joersbo, M. and Poulsen, M.H. (2001). Development of yellow seeded *Brassica napus* of double low quality. *Plant Breed.*, **120** (6): 473-478.
- Sachan, J.N., Singh, D., Singh, A.K. and Pant, D.P. (2007). Inheritance of flower colour in *Brassica rapa* spp. *yellow sarson*. *Pantnagar J. Res.*, **5**(2):75-76.

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