

## YSWB 2011-10-1 (Anushka) - a new yellow sarson (*Brassica rapa* var. *yellow sarson* L.) variety suitable for cultivation in West Bengal

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### ABSTRACT

The experiment on the performance of various yellow sarson varieties was carried out at Pulses and Oilseed Research Station, Berhampore during the winter season of 2010-11, 2012-13 and 2014-15 under Initial variety Trial (IVT) of AICRP (Rapeseed Mustard). Among the varieties YSWB-2011-10-1 developed at PORS, Berhampore was included in the trial. The experiment was laid out in Randomized Complete Block Design (RCBD) having three replications, with each sub plot size of 5.0 x 1.5 m<sup>2</sup>. Statistical analysis of the data showed significant differences for all the parameters except days to 50 per cent flowering, days to maturity and 1000 seed weight. It was observed that YSWB-2011-10-1 (Anushka) registered 29 per cent seed yield and oil yield increase during 2010-11 and 18 per cent seed yield increase during 2012-13 over standard check variety B-9 under zone V at All India level. During 2014-15, YSWB-2011-10-1 (Anushka) was tested against two toria varieties viz. Panchali (ZC) and PT-303 (NC). The entry recorded 8.7 per cent and 9.0 per cent seed yield increase 13.9 and 14.2 per cent oil yield increase over the two toria check varieties. Based on the performance of the coordinated trial over the years the varieties YSWB-2011-10-1 (Anushka) has been passed by State Variety Release Committee (SVRC) for release in West Bengal.

**Keywords** : Anushka, performance, yellow sarson, YSWB-2011-10-1

India occupies a prominent place in global oilseeds scenario with 12-15% of area, 6-7 per cent of vegetable oil production, 9-10 per cent of total edible oil consumption and 13.6 per cent of vegetable oil imports (Paroda, 2013). The country produces seven edible oilseed crops viz. groundnut, rapeseed-mustard, soybean, sunflower, sesame, safflower and niger and two non edible oilseeds viz. castor and linseed (Hegde, 2009). The diverse agro ecological condition of West Bengal is favourable for growing all these nine annual oilseeds. Rapeseed mustard solely contributes 53 per cent of the total oilseed production with productivity of 764 kg ha<sup>-1</sup> in the state during 2008-09 (Dutta, 2014). The productivity of rapeseed mustard is far below the potential yield. Although there are several factors for poor yield, one of the main factors is the use of very old varieties in large areas of the state. The variety B-9 is popular in West Bengal but since it is cultivated for last 35 years, the productivity is often low due to attack of pest and diseases. Keeping this in mind the crop improvement programme was undertaken at PORS, Berhampore, West Bengal during 2003-04. Several entries were developed through crossing of different varieties followed by selection since 2003-04. Sixteen promising entries were selected under preliminary yield trial and multi location trial and nominated for testing under All India Coordinated Research Project (AICRP) on Rapeseed Mustard. Among the entries YSWB-2011-10-1 (Anushka) performed better across various locations of India under zone III and zone V (Anon., 2012, 2013 and 2015). The present study was aimed to highlight the performance of YSWB-2011-10-1

(Anushka) over the years and locations with respect to yield and yield components and to identify the variety suitable for West Bengal condition to bridge the 50 per cent deficit of oilseed production.

### MATERIALS AND METHODS

In order to study the performance of various yellow sarson entries developed at PORS, Berhampore, West Bengal the experiment was started during *rabi* season of 2009-10 to 2011-12 under preliminary yield trial (PYT) and multi-location yield trial (MLT). During 2010-11 and 2012-13 the entry was tested under IVT Yellow sarson trial. During 2014-15 the entry was again tested under IVT Toria trial at national level. Among various entries YSWB-2011-10-1 (Anushka) was sent to the Directorate of Rapeseed Mustard Research (DRMR) for testing under coordinated trial during 2010-11 to 2014-15. Simultaneously multi location adaptive trial was also conducted under different agro-climatic zones of West Bengal. The experimental design was Randomized Complete Block Design (RCBD) having three replications and plot size of 5.0×1.5 m<sup>2</sup>. The number of row plot<sup>-1</sup> were five with a spacing of 30 cm. Seeds were sown in lines and after emergence one healthy seeding was maintained at a spacing of 10 cm. Uniform dose of fertilizer @ 100 kg N, 50 kg P<sub>2</sub>O<sub>5</sub> and 50 kg K<sub>2</sub>O ha<sup>-1</sup> was applied. Observations were recorded on ten randomly selected plants per plot to record the data on plant height (cm), 50 per cent flowering (days), maturity (days) and 1000 seed weight (g). Seed yield (kg ha<sup>-1</sup>), oil content (%) and oil yield (kg ha<sup>-1</sup>) were also estimated. The mean values were subjected to statistical analysis.

**Table 1: Zone wise seed and oil yields of YSWB-2011-10-1 (*Anushka*) during IVT, Rabi 2010-11**

Variety	Seed yield (kg ha <sup>-1</sup> )	Seed yield (% increase over checks)	Oil yield (kg ha <sup>-1</sup> )	Oil yield (% increase over checks)	Seed yield (kg ha <sup>-1</sup> day <sup>-1</sup> )
<b>YSWB-2011-10-1</b>	<b>1730</b>		<b>761</b>		<b>21</b>
B-9 (LC)	1343	28.8	592	28.55	13
NRCYS 05-02 (LR)	1615	7.12	691	10.13	16
YSH-401(NC)	1620	6.79	648	14.84	16
<b>SEm (±)</b>	<b>72</b>				
<b>LSD (0.05)</b>	<b>212</b>				

Source : Annual report of Directorate of Rapeseed Mustard Research, Bharatpur, Rajasthan, 2011) NC-National Check, LR-Latest Release, LC- Local Check

**Table 2 : Zonal performance of YSWB-2011-10-1 (*Anushka*) in respect of seed yield in national trial (IVT, Rabi 2012-13).**

Variety	Seed yield Kg ha <sup>-1</sup>				% increase in Zone-V over checks
	Berhampore	Zone-III	Zone-V	Mean of Zone-III & V	
<b>YSWB-2011-10-1</b>	<b>1765</b>	1380	1478	1435	
B-9 (LC)	1377	1459	1250	1343	18
NRCYS 05-02 (LR)	1412	1749	1272	1484	16
YSH-401 (NC)	1539	1631	1335	1467	11
Pitambari(LR)	1418	1593	1445	1511	2
<b>SEm (±)</b>	<b>64</b>				
<b>LSD (0.05)</b>	<b>190</b>				

(Source: Annual report of Directorate of Rapeseed Mustard Research, Bharatpur, Rajasthan , 2013). NC-National Check, LR-Latest Release, LC- Local Check.

**Table 3: Zonal Performance of YSWB-2011-10-1 (*Anushka*) in respect of seed yield in national trial (IVT, Rabi 2014-15) mean of 5 locations under Zone-V.**

Variety	Seed yield (Kg ha <sup>-1</sup> ) Zone-V	Seed yield % increase in Zone-V over checks		Oil content (%)	Oil yield (Kg ha <sup>-1</sup> )	Oil yield % increase over checks	
		Panchali (ZC)	PT-303 (NC)			Panchali (ZC)	PT-303 (NC)
		Anushka (YSWB-2011-10-1)	1110			8.72	9.04
Panchali (ZC)	1021			41.50	424		
PT-303(NC)	1018			41.53	423		

(Source: Annual report of Directorate of Rapeseed Mustard Research, Bharatpur, Rajasthan , 2015 under zone V). NC=National Check, ZC= Zonal Check.

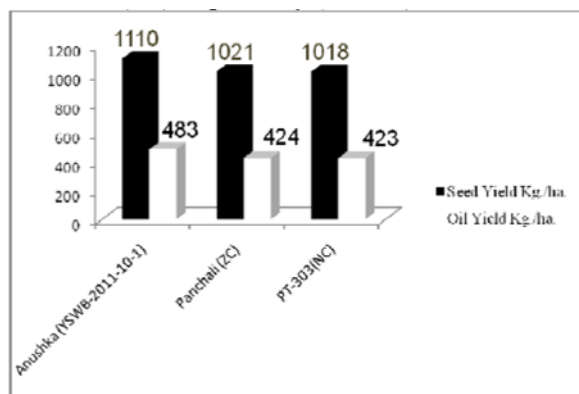
**Table 4: Parentage and ancillary characters of Anushka (YSWB 2011-10-1) in comparison to B-9 (Benoy)**

Entries	Parentage	Ancillary Characters					
		Plant Height (cm)	Days 50% flowering	to	Days to Maturity	1000 seed wt. (g)	Oil content (%)
Anushka (YSWB 2011-10-1)	B9X Rajendra Sarson	100-110	31		86	3.103	45.0
B-9 (Benoy)		100	40		94	3.075	45.0

Source: Annual report of Pulses and Oilseed Research Station, Berhampore, W.B. 2012-13, Page No. 100-101.

## RESULTS AND DISCUSSION

During the period 2010-11 to 2014-15 the entry YSWB-2011-10-1 (*Anushka*) was tested against four check varieties viz. B-9 (Standard check), NRCYS 05-02, YSH 04-01 and Pitambari (recently released variety) under coordinated trial. The test entry of yellow saron namely YSWB-2011-10-1 (*Anushka*) recorded 28.8, 7.12 and 6.79 per cent more seed yield and 28.55, 10.13 and 14.84 per cent more oil yield than B-9 (LC), NRCYS 05-02 (LR) and YSH-401(NC), respectively during *rabi*, 2010-11 (Table 1). YSWB-2011-10-1 (*Anushka*) produced seed yield of 21kg ha<sup>-1</sup>day<sup>-1</sup> and matures 15 days earlier than the check varieties. The check varieties B-9, NRCYS 05-02, and YSH-401 produced seed yield of 13, 16, and 16 kg ha<sup>-1</sup> day<sup>-1</sup>. Since the cropping sequence of West Bengal is rice-yellow sarson-rice, farmers prefer short duration oilseed as catch crop in between two rice crops. The entry YSWB-2011-10-1 (*Anushka*) may suit under such condition. YSWB-2011-10-1 (*Anushka*) ranked third at coordinated trial during 2012-13 under zone V with 18, 16, 11 and 2 per cent yield advantage over four checks viz. B-9 (LC), NRCYS 05-02 (LR), YSH-401(NC) and Pitambari (LR) respectively (Table 2).



**Fig. 1: Zonal Performance of YSWB-2011-10-1 (*Anushka*) in respect of seed yield and oil yield in national trial (IVT, Rabi 2014-15).**

Since YSWB-2011-10-1 (*Anushka*) matures very early (85 days) it was tested under IVT toria coordinated trial, where it recorded higher seed yield by 8.72 per cent and 9.04 per cent over of two toria check varieties Panchali (ZC) and PT-303 (NC), respectively under Zone-V covering states of eastern India during *rabi* 2014-15. The entry YSWB-2011-10-1 (*Anushka*) also recorded the oil yield advantage of 13.92 and 14.18 per cent over two toria check varieties Panchali (ZC) and PT-303 (NC), respectively under Zone-V (Table 3 and Fig.1).

Seed is most vital input for higher agricultural production for sustainable yield with higher economic returns. To enhance overall rapeseed mustard production without bringing more area, new improved varieties play a big role. The per capita consumption of vegetable oil is rising continuously. The country needs to produce at least 66 million tons of oilseeds by 2020. Based on the performance of the coordinated trial over the years the variety YSWB-2011-10-1 (*Anushka*) has been placed to State Variety Release Committee (SVRC) for identification and release in West Bengal. The variety YSWB-2011-10-1 (*Anushka*) has been already registered at National Bureau of Plant Genetic Resources (NBPGR) with national identity number IC 619327 in part of requirement for notification and release of varieties by “Central Sub Committee on Crop Standards, Notification and Release of Varieties of Agri-Horticultural Crops.”

Hence, the variety YSWB-2011-10-1 (*Anushka*) can be promoted to the farmers to replace the old varieties thereby improving the oilseed production scenario of the state as well as of the country.

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