



Photosynthesis of the near- isogenic lines Triticum aestivum L.



Authors:

Semilet T.V.¹, Silantyeva M.M.², Khlestkina E.K.¹



***¹ Federal Research Center the N.I. Vavilov All-Russian
Institute of Plant Genetic Resources (VIR), St. Petersburg,
Russia***

***² Altai State University,
Barnaul, Russia***

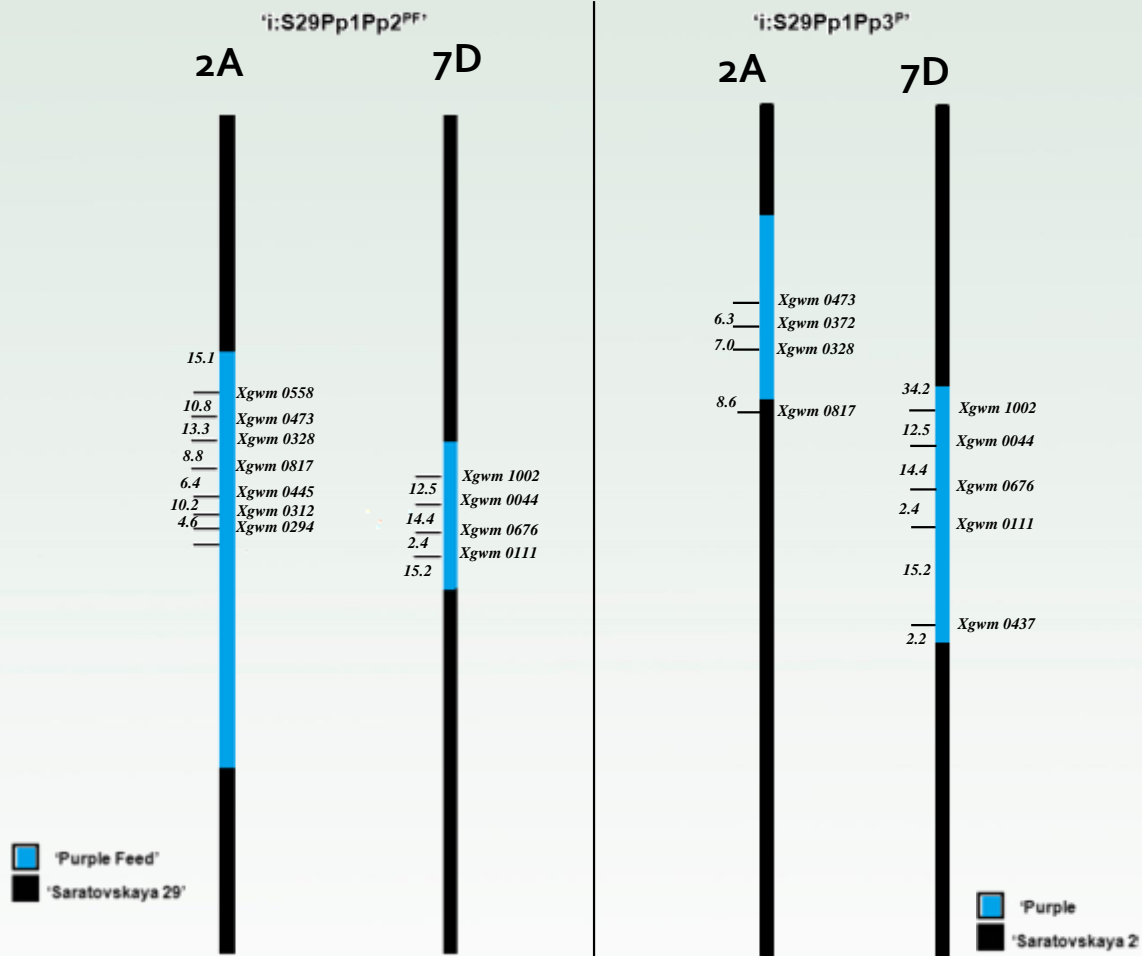


Currently the searching and mapping of gene loci are widely use in molecular genetics. The expression of this genes influences on the operation of photosystems and other physiological processes in higher plants. The crop production of plants depends on photosynthesis. The soft wheat (*Triticum aestivum* L.) is known to be an important object for these studies.



Fig. 1. JUNIOR-PAM (Walz, Germany)

We analyzed parameters of chlorophyll fluorescence for the initial and the near-isogenic lines of soft wheat with JUNIOR-PAM (Walz, Germany) using PAM-fluorimetry method (Fig. 1).



The objects of the study were the recurrent cultivar of soft wheat - Saratovskaya-29 and its isogenic lines. This near-isogenic lines were obtained from the donor varieties (Purple Feed and Purple). The material for the study was kindly provided by The Federal Research Institute of Cytology and Genetics (Novosibirsk, Russia).

The representation of introgression of donor material into near-isogenic lines i: S29Pp1Pp2PF (a) and i: S29Pp1Pp3P (b), were determined using microsatellite markers (Fig. 2). C29 is a recurrent cultivar, Purple Feed and Purple were donor cultivars. Pp1, Pp3 (purple pericarp), Rc (red coleoptile), Pc (purple culm), Pan (purple anthers), Plb (purple leaf blade), Pls (purple leaf sheath) [Tereschenko O.Y., et al., 2012].

Fig. 2. Genetic maps of isogenic lines were built [Tereschenko O.Y., et al., 2012].



The near-isogenic line-iPF2A had high and stable parameters of quantum yield and electron transport rates among other objects. The results obtained for S-iPF2A were associated with a marker *Xgwm372*, which was inherited from the donor *T. aestivum* Purple (Pp3). We associated the genes expression the marker *Xgwm372* with influence on a fluorescence of chlorophyll and a pigment count at different developmental stages (locus *Qchc.iwbr-2A*) [Bhusal N., 2018]

We got results of data photosynthesis for near-isogenic lines of soft wheat Saratovskaya-29 using method PAM-fluorimetry. The locus gene on chromosome 2A was identified based on the available published data. The transformation of this locus may changes the work of photosynthetic apparatus.