



# Study of the development of distinct gene pools in *Brassica napus* L.

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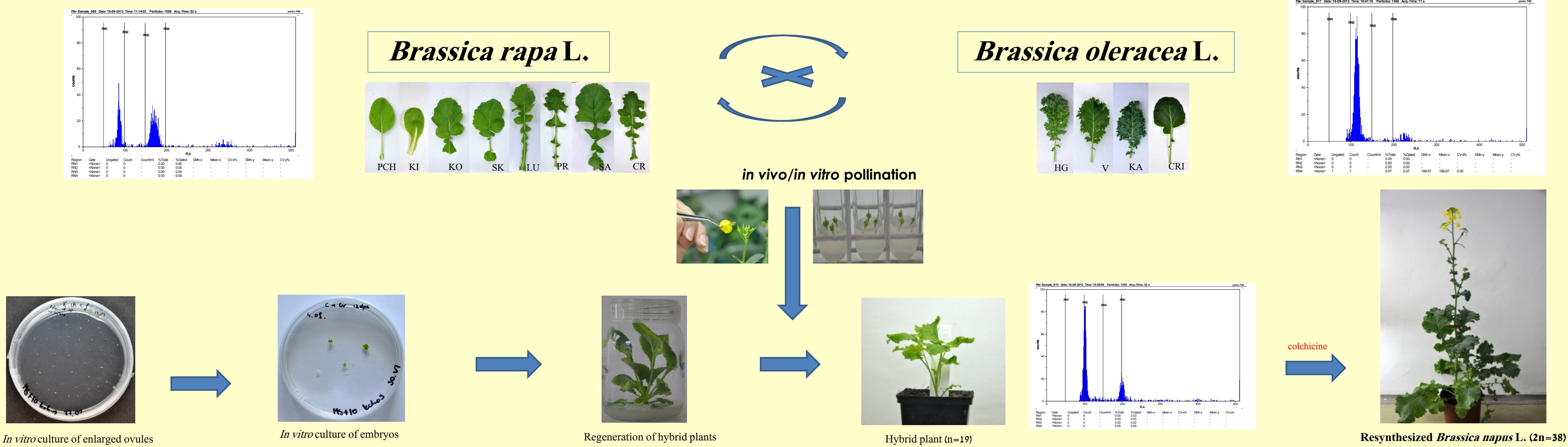
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Hybrid plants resulting from distant crossing forms play a major role in genetic research and plant breeding. Oilseed rape (*Brassica napus* L.; 2n=38, genome AACC), an amphidiploid, originated from different spontaneous crosses between turnip rape (*Brassica rapa* L., 2n=20, AA) and cabbage (*Brassica oleracea* L.; 2n=18, CC). The *B. napus* gene pool was further narrowed by selection for quality traits, because the same two donors had been used worldwide to obtain zero erucic acid and low glucosinolate content (Becker et al. 1995). Intensive breeding has caused a comparatively reduced genetic basis of current breeding materials. In *B. napus*, it is possible to produce “resynthesized” (RS) genotypes via an artificial cross between the parental species, *B. rapa* and *B. oleracea* with the help of the embryo rescue technique (Jesske et al. 2013; Sosnowska et al. 2010). New materials of oilseed rape generated by interspecific hybridizations between suitable genotypes of *B. rapa* and *B. oleracea* could be a valuable source for broadening the genetic diversity of *Brassica napus*. The utilization of artificially resynthesized oilseed rape has offered the possibility to increase genetic variation and to develop genetic distance between (gene pools) heterotic pools of *Brassica napus*.

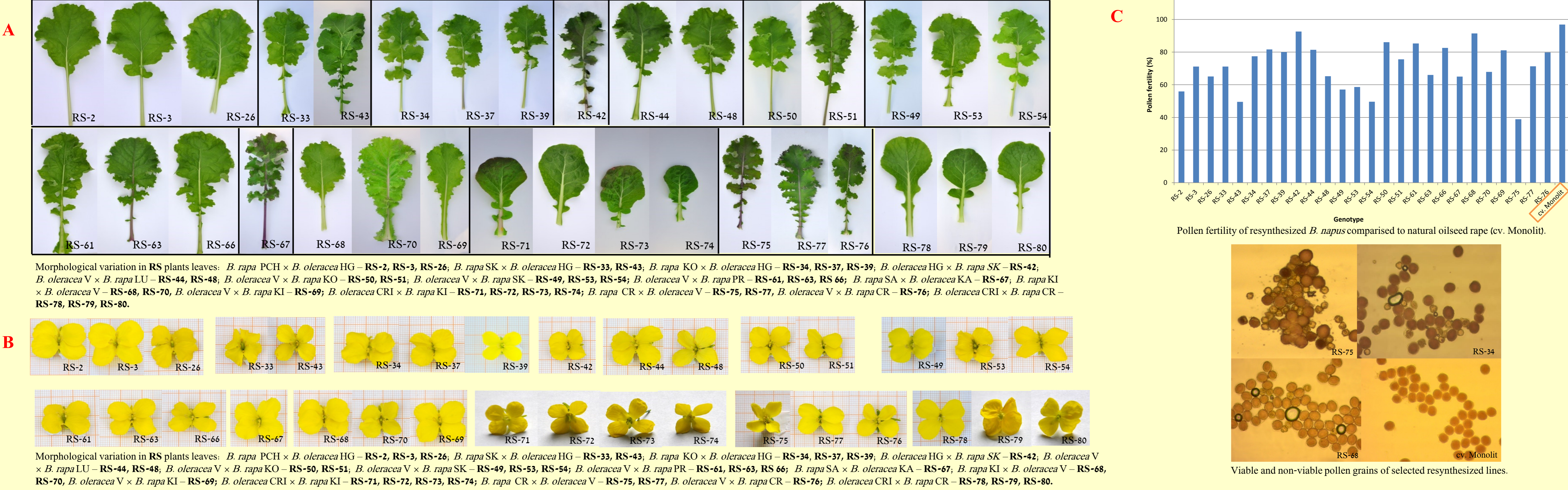
In the present study resynthesized oilseed rape (RS) was obtained as a result of reciprocal crosses between 8 different *B. rapa* and 4 different *B. oleracea* using two methods: 1). *in vivo* pollination and then through *in vitro* culture of isolated embryos in the early stage of their development (embryo rescue culture) (Sosnowska et al. 2010) 2). *in vitro* placental pollination and then by further embryo rescue culture (Sosnowska and Cegielska-Taras 2014).

## THE OBTAINING OF RESYNTHESIZED *BRASSICA NAPUS*

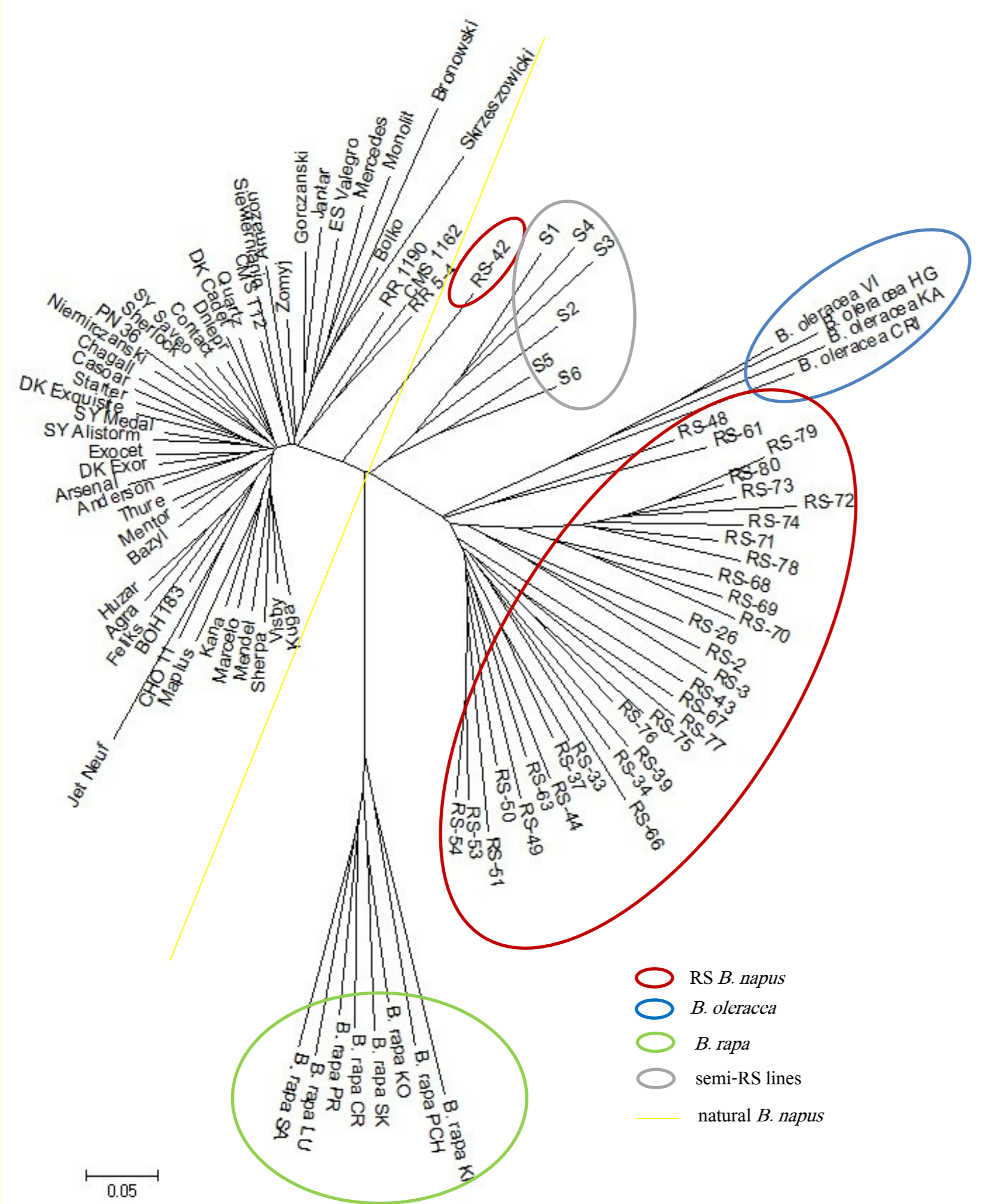


## PHENOTHYPIC EVALUATION OF RESYNTHESIZED *BRASSICA NAPUS*

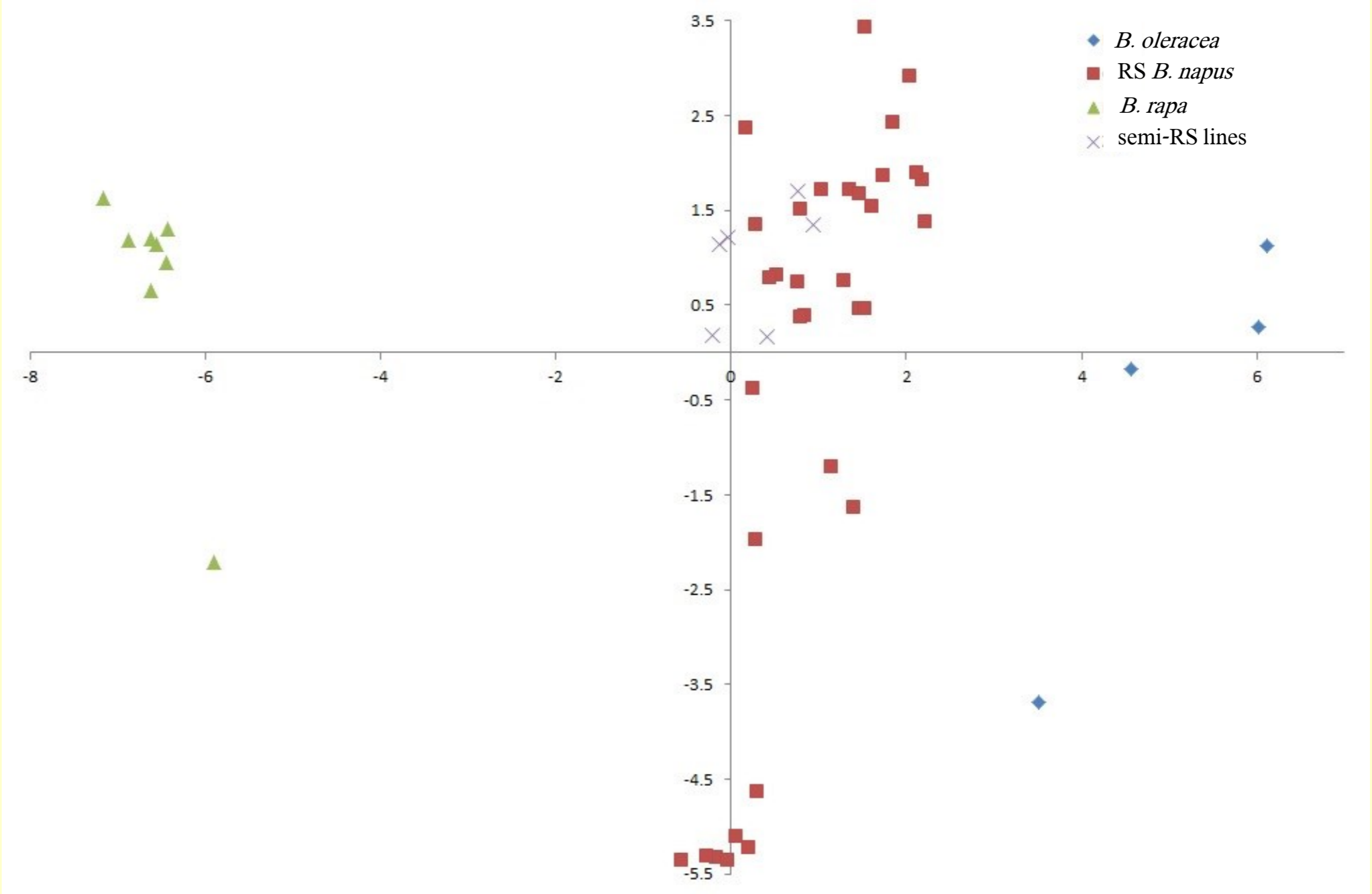
The resynthesized plants were evaluated based on their morphological characters: leaves (A), flowers (B) and pollen fertility (C). A range of variation in morphological traits and pollen fertility were observed in studied RS plants of each cross combination.



## GENETIC SIMILARITY



Dendrogram of the genetic relatedness of 33 RS lines, their parents (*B. oleracea* and *B. rapa*), 6 semi-resynthesized DH lines (line obtained by crossing oilseed rape × RS) and 49 natural oilseed rape based on ten AFLP primer combinations that gave a total of 522 amplified fragment length polymorphisms.



Resynthesized *B. napus* represents a suitable genetic resource for broadening the basis of oilseed rape breeding.