The family Brassicaceae are considered as one of the ten most economically important plant families. The [genus](https://en.wikipedia.org/wiki/Genus) *Brassica* is known for its important agricultural and horticultural crops. Most are seasonal plants ([annuals](https://en.wikipedia.org/wiki/Annual_plant) or [biennials](https://en.wikipedia.org/wiki/Biennial_plant)), but some are small shrubs. Generally, *Brassica* species has been developed in the areas with high rainfall and performs poorly in the areas with low rainfall. Growth and seed yield production of *Brassica* species have greatly decreased owing to drought conditions.

The "triangle of U" diagram, showing the genetic relationships among six species of the genus *Brassica* ([*B. carinata*](https://en.wikipedia.org/wiki/Brassica_carinata), [*B. juncea*](https://en.wikipedia.org/wiki/Brassica_juncea), [*B. oleracea*](https://en.wikipedia.org/wiki/Brassica_oleracea), [*B. napus*](https://en.wikipedia.org/wiki/Brassica_napus), [*B. nigra*](https://en.wikipedia.org/wiki/Brassica_nigra), and [*B. rapa*](https://en.wikipedia.org/wiki/Brassica_rapa)). The theory is summarized by a triangular diagram that shows the three [diploid](https://en.wikipedia.org/wiki/Diploid) genomes, denoted by AA, BB, and CC, at the corners of the triangle, and the three derived ones, denoted by AABB, AACC, and BBCC, along its sides.

Production of third generation allohexaploid (AABBCC) plants through crossing between the parental *Brassica* *napus*, *carinata*, *juncea* and *oleracea* genotypes followed by three selfing generations of the F1 hybrid.

N6C2J2 allohexaploid population (2*n* = AABBCC) was created through an initial hybridization between parental species *B*. *napus* (2*n* = AACC) × *B*. *carinata* (2*n* = BBCC)genotypes. The generated gametes were subsequently crossed with the *B*. *juncea* (AABB)genotype. The resulting allohexaploid population was then self-pollinated for two generations to obtain the **maternal N6C2J2 plants**.

The **paternal J3O1 allohexaploid population** was generated through hand pollination involving parental species *B*. *juncea* (AABB) × *B*. *oleracea* (CC)genotypes followed by ovule culture. The resulting ABC plants were then colchicine treated to double their chromosome number and put through four generations of self-pollination to obtain the paternal J3O1 allohexaploid population.

Progenies from these two allohexaploid populations were crossed and produce **N6C2J2.J3O1 F­1­** hybrid plants which were all self-pollinated to get S­1­ population. S1 seeds in this segregating population together with parental control seeds were germinated in March 2021 under greenhouse conditions. Three selfing generations of F1 hybrid to get S3 experimental population.

Specific microsatellites markers for each subgenome

* Larger trees may also have lower drought tolerance because of microenvironmental and ecological factors. Their crowns tend to occupy more exposed canopy positions, which are associated with higher evaporative demand (Kunert et al., 2017)
* Taller trees face the biophysical challenge of lifting water greater distances against the effects of gravity and friction (Ryan et al., 2006; McDowell et al., 2011; McDowell & Allen, 2015; Couvreur et al., 2018).
* Vertical gradients in stem and leaf traits – including smaller and thicker leaves (higher leaf mass per area), greater resistance to hydraulic dysfunction (i.e. more negative water potential at 50% loss of hydraulic conductivity, more negative P50), and the tapering of hydraulic conductivity at greater heights (Koike et al., 2001; McDowell et al., 2011; Couvreur et al., 2018) – enable trees to become tall (Couvreur et al., 2018)
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