

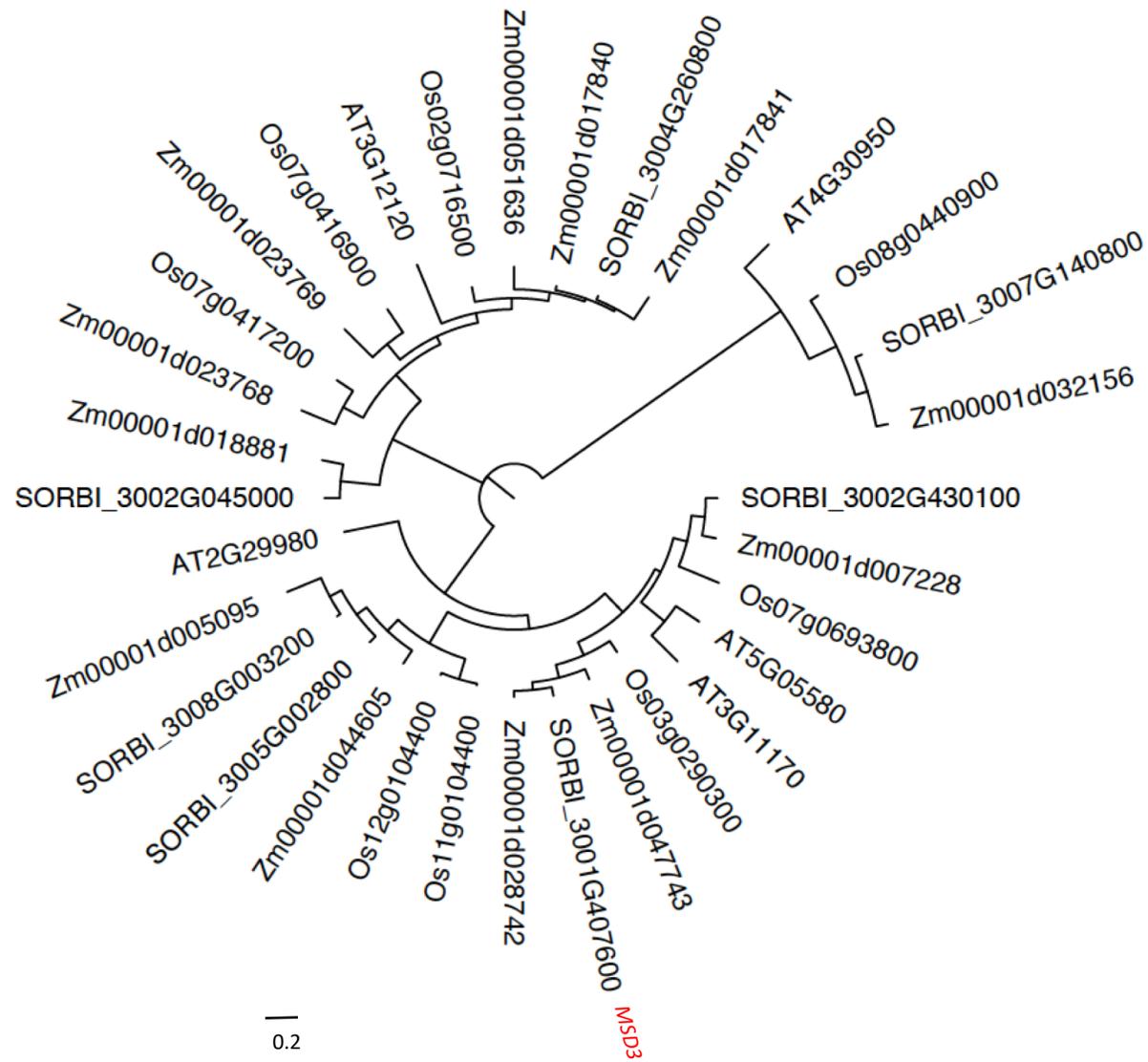


BTx623

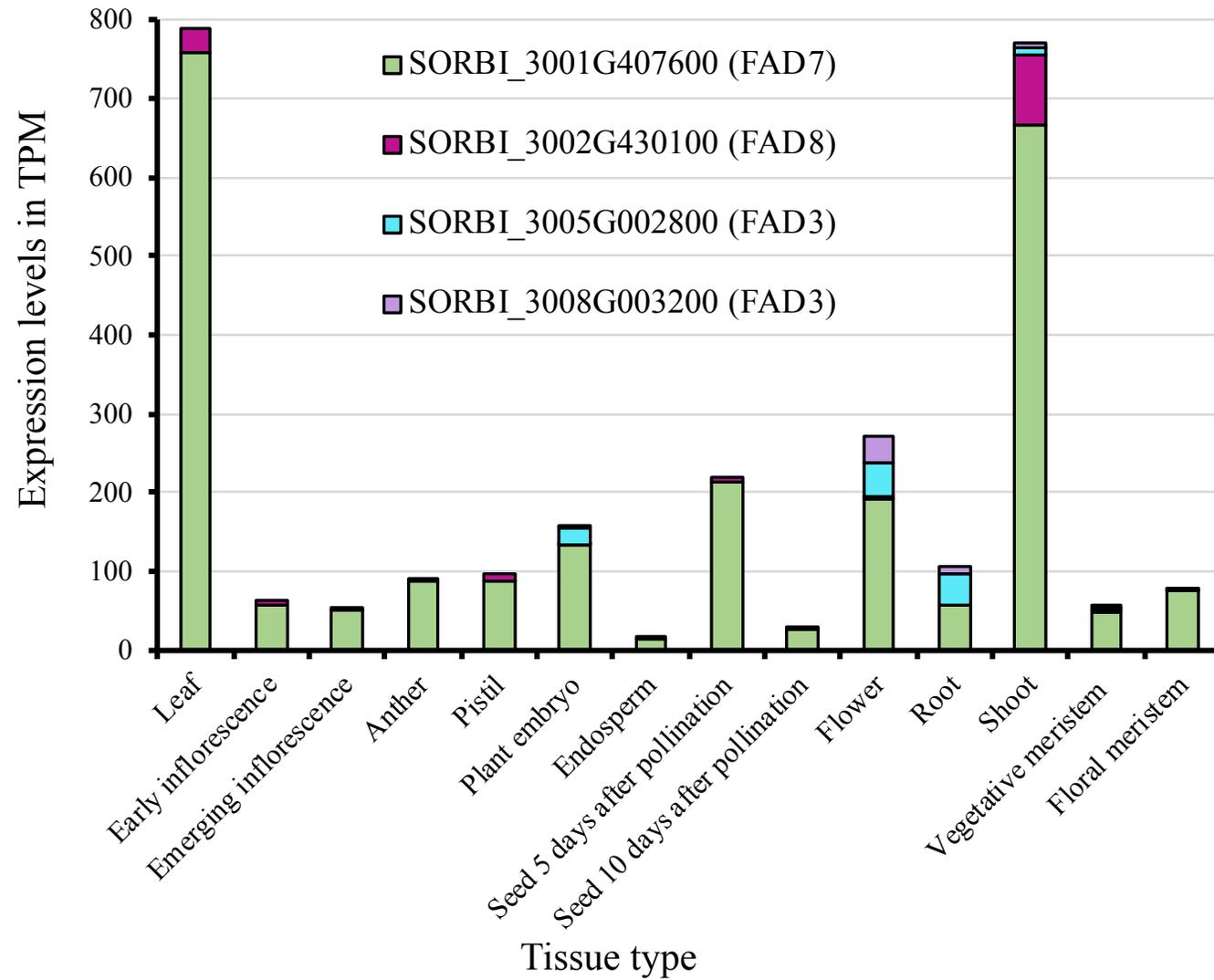
*msd3-1*

*msd3-3*

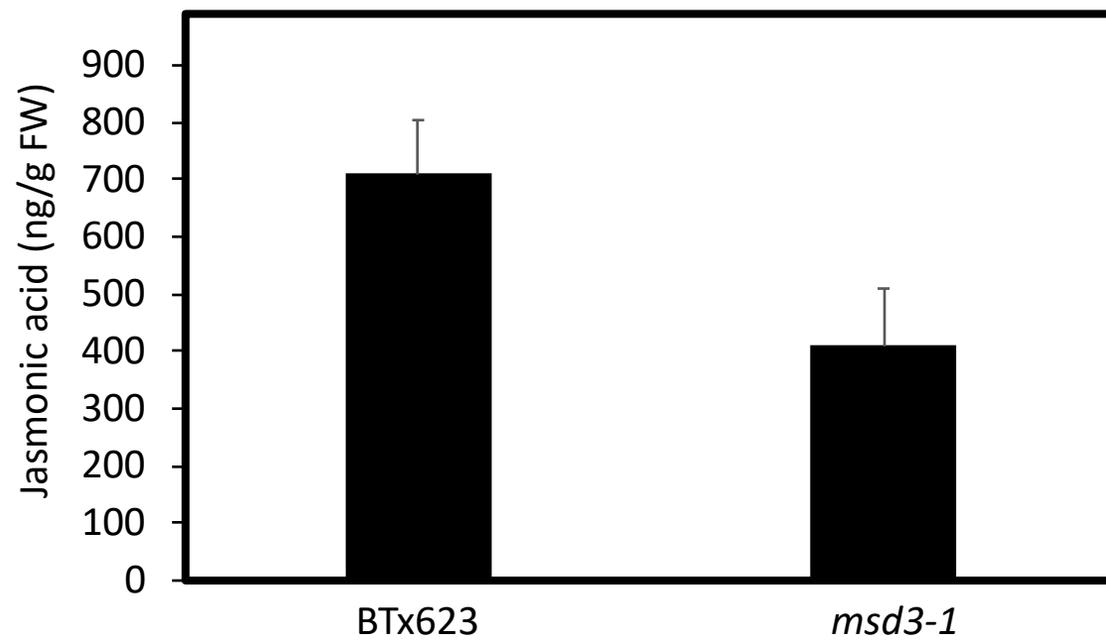
**Supplementary Figure 1S. Panicle architecture of *msd3* mutants.** Typical panicles of BTx623, *msd3-1*, and *msd3-3* were cut from the field from growing season of 2019 and photographed in the laboratory. The *msd3-2* and *msd3-4* were not planted in the field.



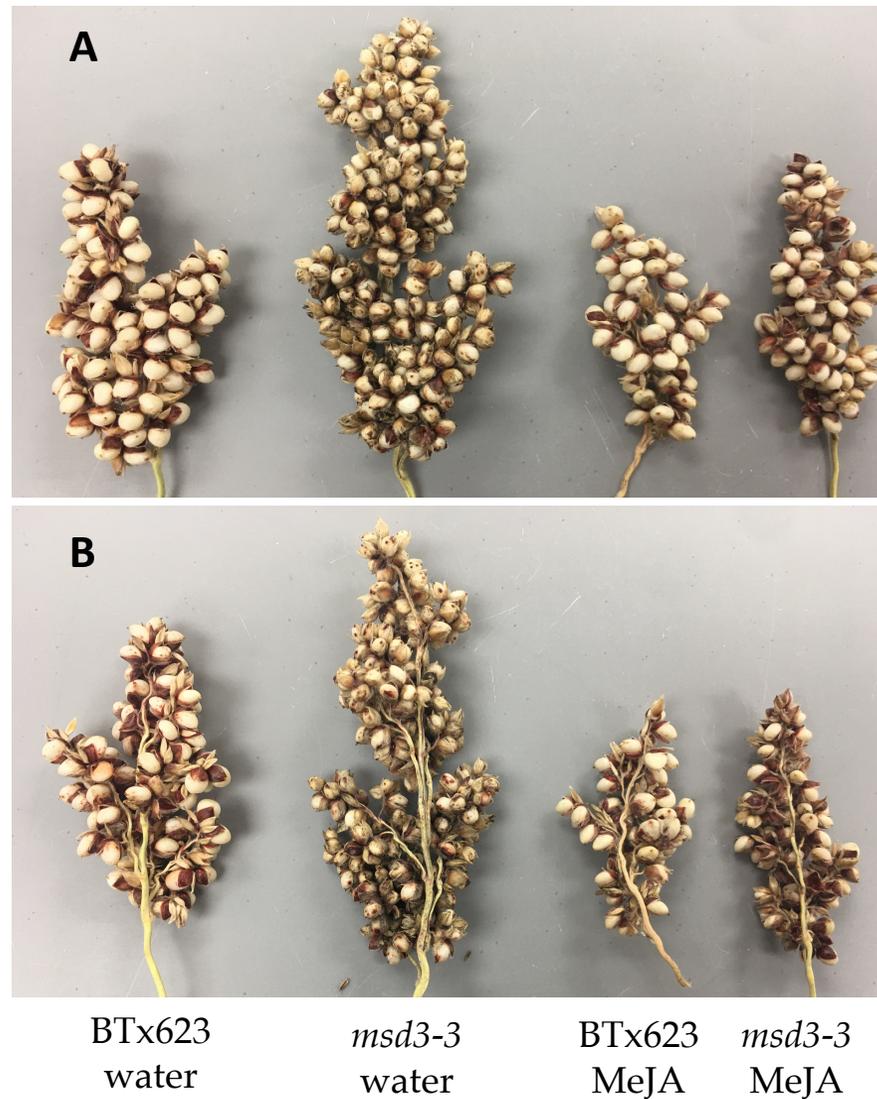
**Supplementary Figure 2S:** Phylogenetic analysis of  $\omega$ -3 fatty acid desaturases.



**Supplementary Figure 3S:** Tissue specific expression of sorghum  $\omega$ -3 fatty acid desaturases. Tissue-specific expression of sorghum  $\omega$ -3 fatty acid was annotated from an online data base (<https://www.ebi.ac.uk/gxa/home>).



**Supplementary Figure 4S. JA in developing panicles of BTx623 and *msd3-1* mutant.** Panicles at stage 4 (about 1.5 cm in length) were sampled and froze in liquid nitrogen. The content of cis-JA was expressed as ng/g fresh weight. T-test indicated the difference is significant with p-value=0.004.



**Figure 5S Primary Inflorescence Branches of BTx623 and *msd3-3* treated with 0.05% Tween-20 in water and 0.05% Tween-20 containing 1 mM MeJA in water.** A typical primary inflorescence branch from the middle of the panicle were photographed. A. The view from outside of a primary inflorescence branch showing the increased grain number of the *msd3-3* mutant over the BTx623. B. The view from inside of a primary inflorescence branch showing the sterile pedicellate spikelets in BTx623, fertile pedicellate spikelets in *msd3-3*, reversion to sterile pedicellate spikelets after treatment with MeJA.