

Name: *jasmonic acid insensitive1-1 (jai1-1)*

Accessions: H17

Gene ID: Solyc05g052620

Map position: chromosome 5

Gene function: F-box protein that recognizes the hormone jasmonic acid (JA) in the SCF complex. The *JAI1* protein, which is homologous to the *Arabidopsis COI1*, is a receptor component in the JA signal transduction pathway.

Gene effect: Plants harboring the defective allele are insensitive to JA.

Phenotypes: Until the flowering stage, MT-*jai1-1* is almost morphologically indistinguishable from the control MT, besides its high susceptibility to arthropods (white fly, *Tuta absoluta* and mites). Upon flowering, MT-*jai1-1* tends to form exerted styles and glabrous (trichomeless) fruits. MT-*jai1-1* also presents delayed senescent petals, similar to that of the *Never ripe* mutant. However, MT-*jai1-1* fruits ripe normally. MT-*jai1-1* is female sterile.

Comments: Since *jai1* is female sterile, it is maintained through its use as pollen donor in crosses with MT. The resulted F1 plants are then used as pollen receptor of homozygous *jai1* pollen. This last cross will produce seeds that will segregate 1:1 for heterozygous and homozygous *jai1* seedlings. These seedlings can be screened upon germination in filter paper soaked with distilled water during three days in darkness and then transfer to filter paper soaked with 0.5 mM MeJA for additional two days in darkness. The seedlings are then transfer to light for additional two days where MT and heterozygous *jai1* seedlings will present growth inhibition of roots and hypocotyls and anthocyanin accumulation in hypocotyls, whereas homozygous MT-*jai1* will not. PCR-based screening can be also performed, as described in Li et al (2004).

Description of accessions available: MT-*jai1-1* was obtained by means of gamma ray mutagenesis by Dr. Gregg Howe group.

Figures:



Left photo: hairless fruits of MT-*jai1-1*. Right photo: Exerted style and stigma in a MT-*jai1-1* flower.

Bibliography

Li L, Li CY, Howe GA (2001) Genetic analysis of wound signaling in tomato: evidence for a dual role of jasmonic acid in defense and female fertility. *Plant Physiology* 127:1414-1417.

Li L, Zhao Y, McCaig BC, Wingerd BA, Wang J, Whalon ME, Pichersky E, Howe GA (2004) The tomato homolog of CORONATINE-INSENSITIVE1 is required for maternal control of seed maturation, jasmonate-signaling defense responses, and glandular trichome development. *Plant Cell* 16:126-143.

Campos ML, Almeida M, Rossi ML, Martinelli AP, Junior CGL, Figueira A, Rampelotti-Ferreira FT, Vendramim JT, Benedito VA, Peres LEP (2009) Brassinosteroids Interact negatively with jasmonates in the formation of anti-herbivory traits in tomato. *Journal of Experimental Botany* 60:4347-4361.