

Accessions Having Opposite Leaf Arrangement at the First True Leaf in Watermelon

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Watermelon plants normally have alternate leaves, with a single leaf per node that is positioned 180° from leaves at adjacent nodes. During a screening of the watermelon germplasm collection (totaling 1613 accessions) for disease resistance, we observed an opposite leaf arrangement at the first true leaf of several PI accessions (PI 559995, PI 560008, and PI 560010). These PI accessions were heterogeneous for leaf arrangement, with some plants having only one first true leaf and others having two opposite first true leaves, borne at a 90° angle from the second true leaf (Fig. 1). A very short internode length between first and second true leaves may cause opposite leaf arrangement in watermelon. Opposite leaf arrangement at the first true leaf is unstable. All plants with opposite leaves at the first nodes of their main stem eventually revert to alternate leaf arrangement. Most of the time they reverted at the second node, but occasionally it was at the third node. Opposite leaf arrangement also occurs in cucumber in the cultivar Lemon.

Robinson (1) reported that opposite leaf arrangement in cucumber is controlled by a single recessive gene. In the F₂ generation of reciprocal crosses between alternate- and opposite-leaved cucumber plants, the proportion of seedlings with opposite leaves

was significantly less than 25% in each of 26 F₂ populations. The combined segregation ratio was 875 alternate to 86 opposite. Tkachenko (2) concluded that at least three genes are required to produce opposite leaves in cucumber. An alternate explanation is that inheritance is simple, but the single recessive gene has incomplete penetrance. Youngner (3) reported that genes of 'Lemon' for sex expression (*m*) and five fruit locules (*l*) were linked, and were associated with opposite leaves in segregating generations.

Research is needed to determine the inheritance of opposite leaf arrangement at the first true leaf stage in watermelon.

Literature Cited

1. Robinson, R.W. 1987. Inheritance of opposite leaf arrangement in *Cucumis sativus* L. *Cucurbit Genet. Coop. Rpt.* 10: 10-11.
2. Tkachenko, N.N. 1935. Preliminary results of a genetic investigation of the cucumber, *Cucumis sativus* L. *Bull. Appl. Pl. Breed. Ser. 2*, 9:311-356.
3. Youngner, V.B. 1952. A study of the inheritance of several characters in the cucumber. Ph.D. Thesis. Univ. Minnesota, St. Paul.

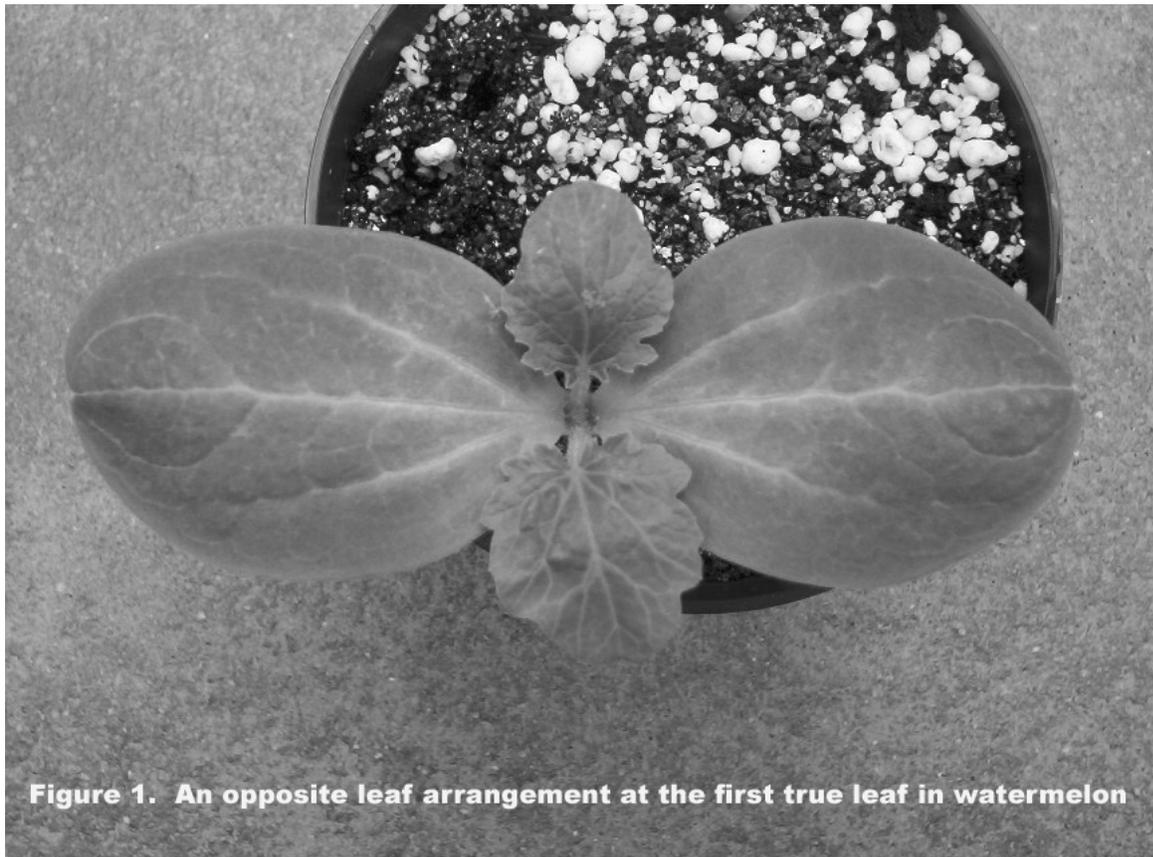


Figure 1. Opposite leaf arrangement at the first true leaf in watermelon.