Monocots and dicots are two categories of angiosperm plants. The eponymous characteristic of these groups is the number of cotyledons. Monocots, like the different species of grasses and lilies, have one cotyledon, while dicots have two. Aberrations are rarely found, but three cotyledons were documented for some species like Opuntia ficus-indica, Ceratopogon mahabalesi and Withania somnifera. This so-called tricotyledony or tricotyly may be due to genetic variability. Holtorp defined three categories of tricotyledony: fission, where one cotyledon is split into two; twinning, where one original cotyledon appears as two conjoint ones; supplementation, where the first true leaf, apical to the original cotyledon, develops as a third cotyledon. A fourth variant of tricotyledony was found in Phaseolus vulgaris, with three symmetrically arranged cotyledons of equal size and shape emerging from three or six symmetrically arranged vascular bundles. Pomegranate (Punica granatum) is a shrub or treelet of up to 7 m height. It is a species of the dicot family Lythraceae and is native to Southwest Asia; now it is also cultivated in South and Southeast Asia, parts of North and South America, and in the Mediterranean region. Common interest in pomegranate increased when the therapeutic value of the fruit was discovered. A tricotyledonous seedling of P. granatum was reported to me by a private breeder. She raised four seedlings of P. granatum in Aachen, Western Germany. The four seeds came from the same pomegranate fruit. Only one of the seedlings showed tricotyledony (Figure 1 a and b). A spontaneous mutation leading to this abnormal growth seems likely. The three cotyledons were similar in shape, comparable in size and were symmetrically arranged on the shoot (Figure 1). The first three true leaves following the cotyledons were arranged in a spiral manner. After just three true leaves, the phyllotaxis changed and the leaves grew in a decussate system (Figure 1 b and c). The other seedlings showed a decussate phyllotaxis from the first true leaves (Figure 1 b). Moreover, the second true leaf of the tricotyledonous seedling showed an incomplete twinning according to Holtorp (Figure 1 b and c). The vascular bundles of the seedling were visible from the outside; there were three bundles up to the cotyledons. Apical to the cotyledons, in the spiral part, the vascular system was irregular. At the transition to the decussate part, the vascular system established four bundles. The tricotyledonous seedling is about 14-weeks old now, 27 cm in height and developing well.

Symmetrically arranged cotyledons, which do not differ in shape or size, are rare for the three types of tricotyledony as defined by Holtorp. The tricotyledony of P. granatum, described here seems to be of the same type as described by Harris et al., with three vascular bundles at the hypocotyl. The authors also showed that a change in the number of cotyledons has an effect on phyllotaxis. In P. vulgaris, a dicot plant has decussate leaf arrangement, while its occasional tricots show whorls with three

Figure 1. a, Tricotyledonous Punica granatum seedling amongst dicotyledonous ones. b, Tricotyledonous seedling showing spiral phyllotaxis and dicotyledonous seedlings showing decussate phyllotaxis. c, Tricotyledonous seedling showing changed phyllotaxis from spiral to decussate after three true leaves.
leaves each. Korekar et al.\textsuperscript{11} found the same result for *Hippophae rhamnoides*, but whorls occurred only at the first few internodes. On the other hand, Wilson\textsuperscript{12} found that the decussate phyllotaxis of *Idiospermum australiens* was unaffected by tricotyledony. Oome\textsuperscript{8} reported that the spiral system of *Mammillaria beneckei* was not altered by tricotyledony, but by tetracotyledony.

The rare combination of tricotyledony, twinning in a true leaf and a change in phyllotaxis shows that a change in the number of cotyledons can have considerable effects on shoot morphology, which might be more variable than expected.


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