

# How 'Mother of Thousands' Makes Plantlets

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New research shows how the houseplant "mother of thousands" (*Kalanchoe diargremontiana*) makes the tiny plantlets that drop from the edges of its leaves. Having lost the ability to make viable seeds, the plant has shifted some of the processes that make seeds to the leaves, said Neelima Sinha, professor of plant biology at UC Davis.

Many plants reproduce by throwing out long shoots or runners that can grow into new plants. But mother of thousands goes further: the plantlets are complete miniature plants that become disconnected from the mother plant's circulatory system and drop off, allowing them to spread rapidly and effectively. The houseplant has lost the ability to make viable seeds and only reproduces through plantlets.

Helena Garcês, a graduate student in Sinha's laboratory, Sinha and colleagues looked at two genes, STM and LEC, in mother of thousands and close relatives, some of which make seeds instead of plantlets. STM controls shoot growth, while LEC is involved in making seeds.

Expression of STM in leaves was essential for making plantlets. In most plants LEC is expressed in seeds, but mother of thousands' version of the gene, LEC1, was expressed in leaves as well. When the researchers transferred the LEC1 variant into other plants, they were unable to make viable seeds.

Mother of thousands appears to have lost the ability to reproduce sexually and make seeds, but transferred at least part of the embryo-making process to the leaves to make plantlets, Sinha said. The findings

could be useful in manipulating plant reproduction, she said.

The other authors on the paper are: Connie Champagne and Soomin Park, postdoctoral researchers at UC Davis; graduate student Brad Townsley; Rui Malhó, University of Lisbon, Portugal; Maria Pedroso, Monsanto Co., St. Louis; and John Harada, professor of plant biology at UC Davis. The work was supported by grants from the National Science Foundation and the Fundação para a Ciência e Tecnologia, Portugal, and is published online by the journal *Proceedings of the National Academy of Sciences*.

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