

Scientists find why size matters in nature

Researchers at the John Innes Centre in Norwich have shed light on the beauty of nature by explaining the mechanism behind the uniformity of leaf and flower size in individual plants.

Investigating how plants arrive at these aesthetic proportions, the team discovered that cells at the margins of leaves and petals play a key role in setting their size.

"The remarkable uniformity of leaves and flowers helps us to tell different species apart, such as daisies and marguerites, which look very similar otherwise. We are now uncovering how the genetic blueprint of a species tightly controls the size of leaves and flowers", said lead author Dr. Michael Lenhard.

The cells at the margins appear to ooze a mobile growth signal that keeps the cells throughout the leaf dividing. The more of this signal is produced, the larger the leaves and flowers get, the team found.

Surprisingly, the authors said, this signal seems to be different from the classical and well-studied plant hormones that are known to influence growth and development.

"As the signal only seems to come in from the margins, we suggest it gets diluted as the leaf or petal grows. Once the concentration falls below a certain threshold, the cells in the leaf or petal stop dividing." Dr. Lenhard said.

"This would be a simple way of measuring the size of a growing organ. It's a bit like adding more and more tonic to a gin and tonic until you can no longer taste the gin," he added.

He further said that noticeably, animals seem to use the same principle of dilution for measuring size, for example of the wings in a fly, although the molecules used are very different.

Efforts are in progress to use this finding to boost leaf growth in bio-fuel crops for the production of sustainable energy and to increase the yield of fruits and seeds