FLOWERING OF NEW INTEREST IN GERANIUMS

Geraniums, or species of *Pelargonium* have been popular since the Victorian era, partly because of the nice colours and shapes of their flowers. Scientists too have long been fascinated by their enormous variety of flower shapes. Analysing these still poses a challenge.

One of the problems in analysing the shape of flowers is that the different parts (petals, stamens and nectar spur) bloom at different times, making it difficult to determine the overall shape of the flower. Freek Bakker, assistant professor of Biosytematics, and his group have come up with a solution. They developed a method for making a virtual 3D model of *Pelargonium* flowers. To do this, a computer combined 2D photos to create a 3D image. 'Formerly, separate characteristics such as length and width were used as markers of flower shape,' explains Bakker. 'But petals with the same measurements can have completely different shapes. Since the 3D models makes use of coordinates, we can now assess flower shapes more accurately.'

> **'Adding the third dimension was essential'**

EVOLVING INDEPENDENTLY

PhD researcher Sara van de Kerke developed the computer model during her research on the evolution of *Pelargonium* flowers. 'Adding the third dimension was essential in the research,' says Van de Kerke. In order to create those models, she and a number of students photographed hundreds of flowering *Pelargonium* parts. Since the various parts of a flower do not come into flower at the same time, the parts were linked up by computer. The models reveals that *Pelargonium* flowers do not evolve as a single whole, but that the forms of the petals, nectar spur and stamens evolve separately. 'This could be explained by the fact that each part has its own function, especially in pollination,' says Van de Kerke.

APPLICATIONS

Studying the shape of *Pelargonium* flowers may just be the start of this 3D model's potential. Besides shape, the model can also precisely measure the thickness, width and surface of parts of a plant. This makes the model useful for other studies too. Bakker has in mind a study on photosynthesis, for example, in which leaf surface is an important factor. Although the 3D computer model was initially developed for fundamental research, Bakker has a hunch that it could be useful in applied research too, in the field of plant-breeding for example. 'The model can be used for shape analyses after cross-breeding,' says Bakker. 'Perhaps this kind of analysis could even be automated in the future, making it a time-saving innovation for plant breeders.'

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