

Determination of Ploidy in Plants Based on Impedance Flow Cytometry

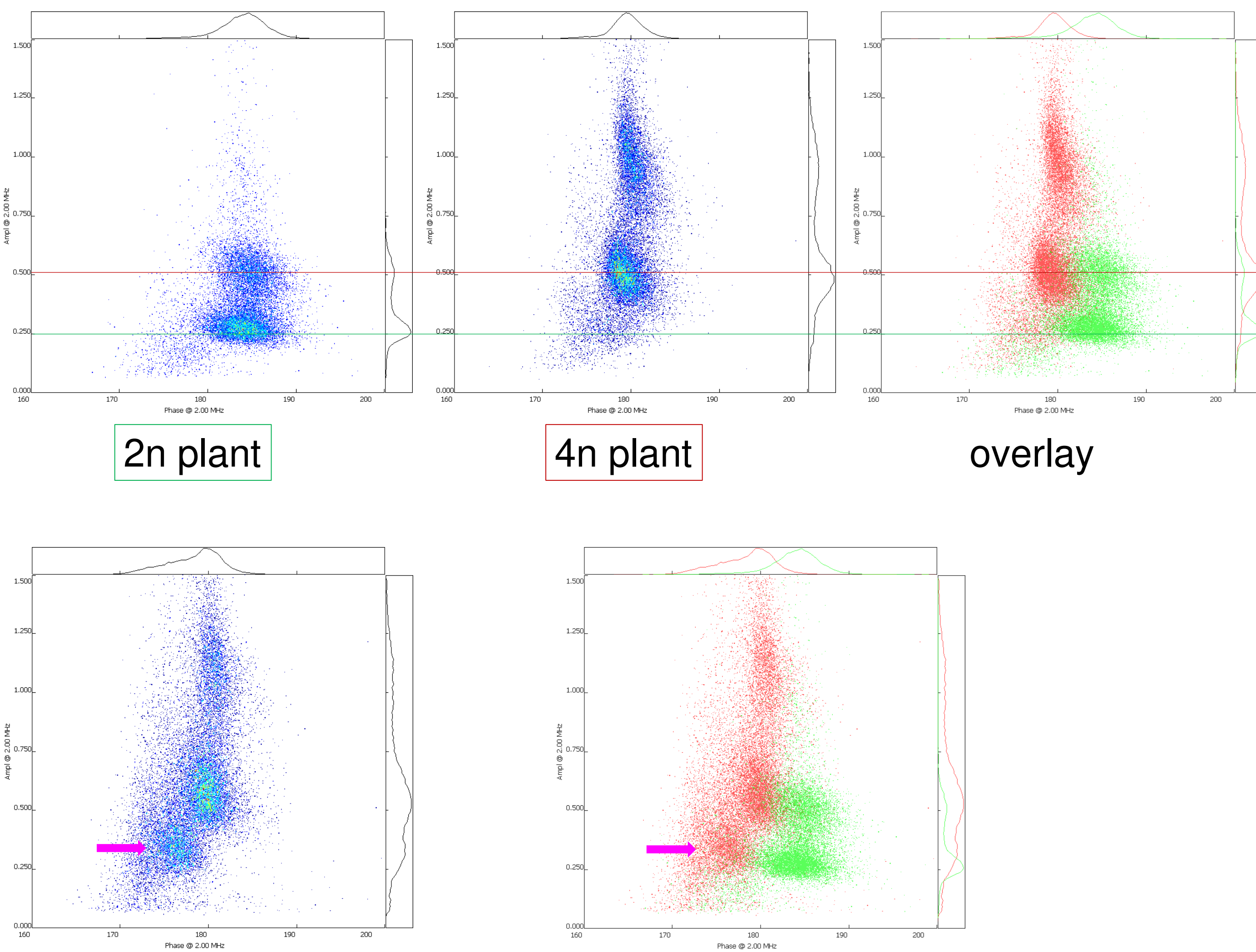


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Polyploidy plays an important role in plant breeding. It is often apparent by a distinct morphology, e.g. increased size, larger cells and bigger pollen. Therefore, pollen size is often taken as a parameter to evaluate the ploidy of plants.

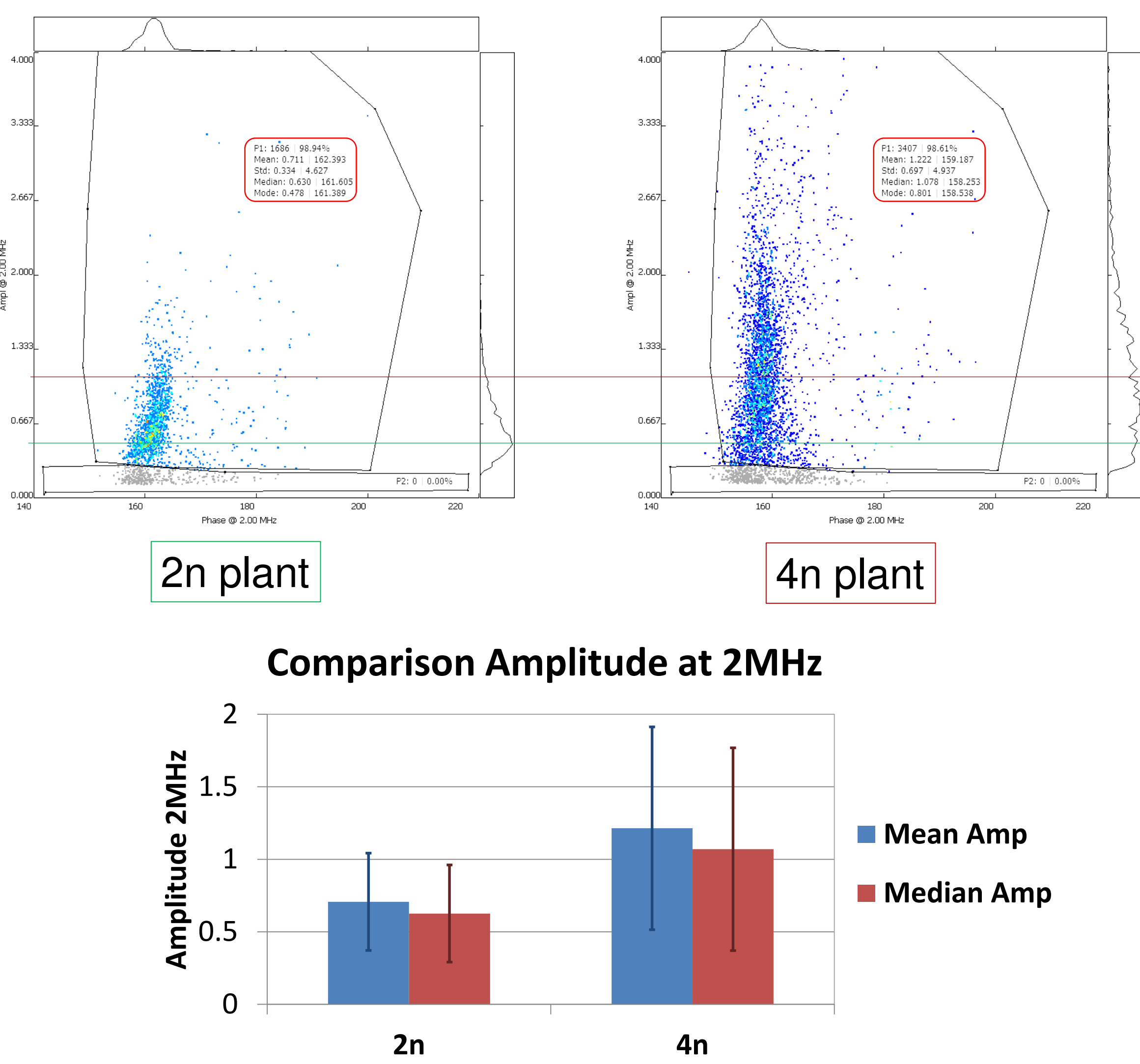
Amphasys provides a convenient and precise technology to characterize pollen grains in terms of size and viability and thus ploidy and fertility. The sample preparation and the measurement are straight-forward and fast.

Cyclamen persicum

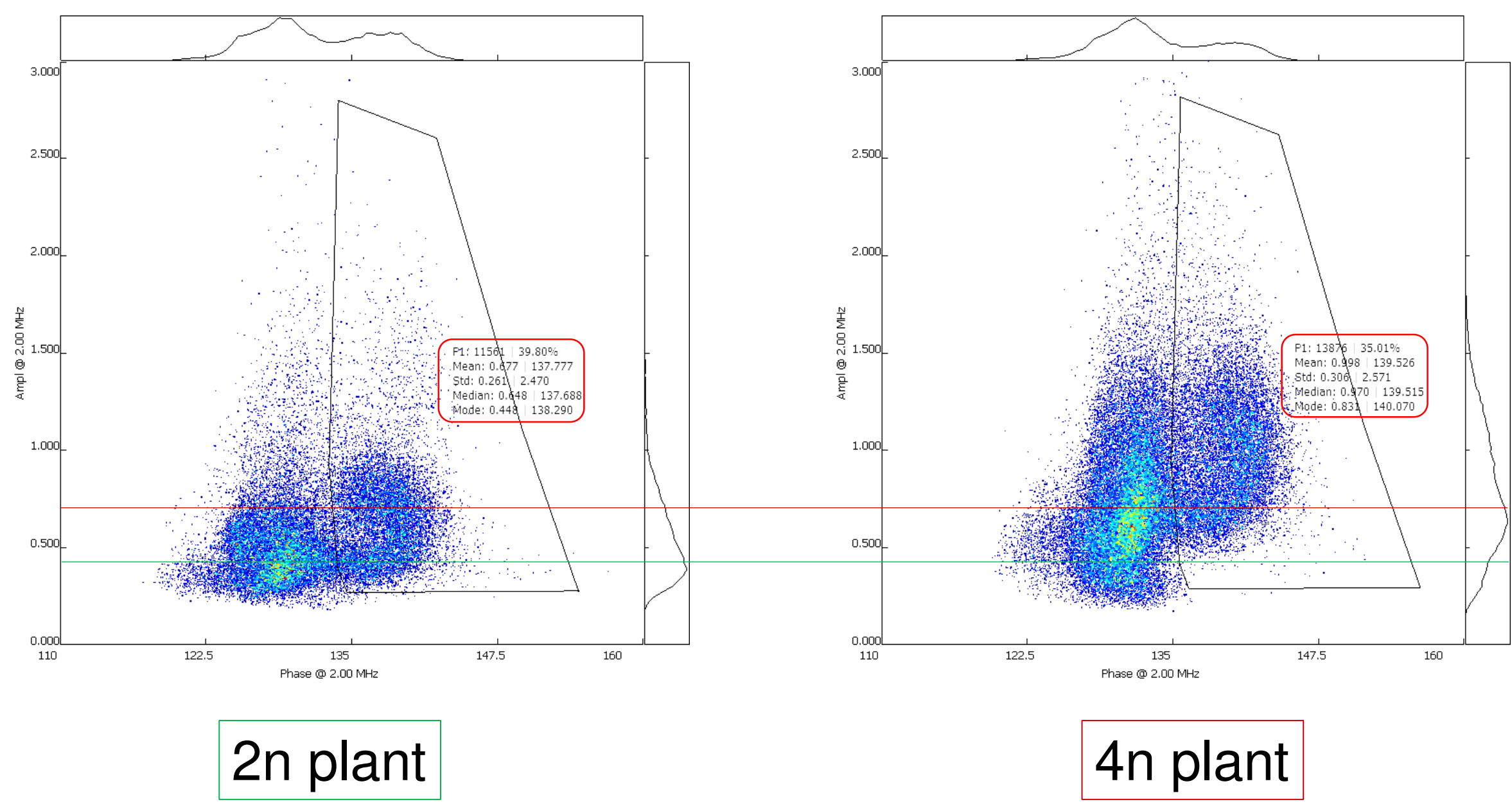


Plot of another 4n genotype with reduced pollen or incomplete pollen development and overlay with the 2n plant; critical points are marked for the tetraploid plant.

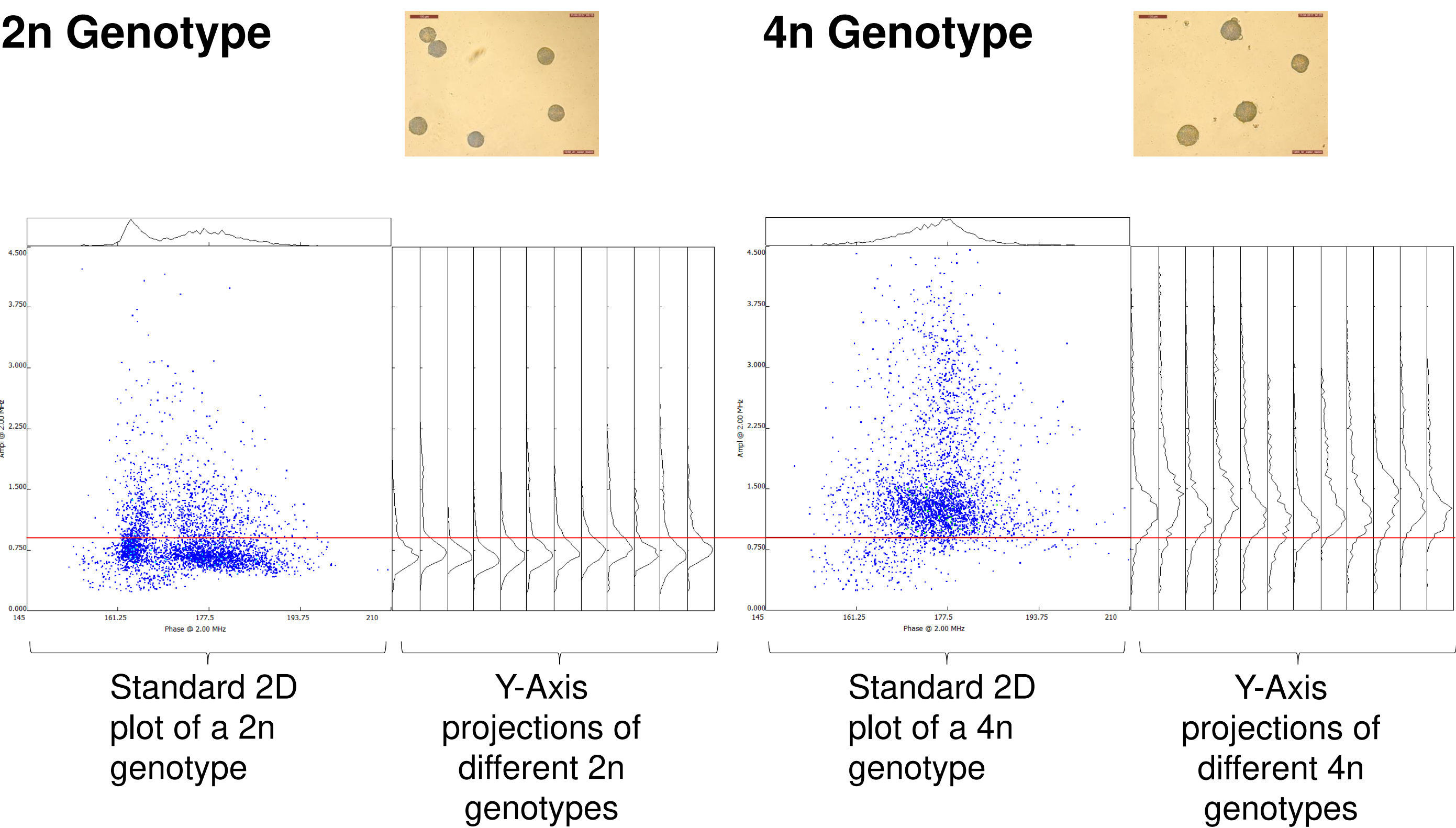
Wheat – Triticum aestivum



Potato – Solanum tuberosum



Watermelon – Citrullus lanatus



Statistical analysis of the same 24 pollen samples from different diploid (2n) and tetraploid (4n) watermelon genotypes. Bars: Median and range.

Experimental set-up for ploidy measurement:

- prepare the measurement well
- use chip with optimal size compared to pollen
- use right buffer
- optimize the settings
- use pollen of same development stage, ideally mature fresh viable pollen
- compare with known standards of 1n, 2n etc. to classify unknown samples

Data analysis supported by AmphaSoft

- visual approach
- statistical approach