Identification of Pear Pollen Germination through Colorimetric and Cytometric Analyses

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Colorimetric and cytometric analysis was performed to reduce drawbacks with respect to reliability, subjectivity of counts, and analysis time in the conventional method and improve the accuracy of measurement. The Congo Red (CR) absorbance of newly elongated pollen tubes was gradually increased at pollen concentrations of 1.25 to 5.0 mg·mL−1, and its trend line was expressed by the equation y = 0.127x + 0.0255 with R² = 0.9938. Although no formula was established for calculating the actual germination rate, the slope of the equation obtained can be interpreted as reflecting the actual germination rate. Differences in pollen distribution between the positive control (PC) and negative control (NC) groups in the Q1-LR quadrant were observed, and the high-density region in the PC group on the dot plot formed a shifted transverse distribution to the right compared to that in the NC group. Although our observations need to be confirmed using larger numbers of pollen samples, we found that the percentage changes in events in the PC groups were expressed as a linear equation (y = 21.302x + 68.972) with a high R-squared value (0.9009). (This study was supported by a grant from the Korea Institute of Planning and Evaluation for Technology in Food, Agriculture, Forestry and Fisheries (IPET) through the Export Promotion Technology Development Program, funded by the Ministry of Agriculture, Food and Rural Affairs (MAFRA) (No. 617075-5).)