

Flower size variation along altitude and gene flow of *Campanula punctata*

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Abiotic environmental changes along altitude influence plant distribution and character variation. In some plants, altitudinal decrease of plant size is known as a genetic structural change in response to climatic change. Flower size variation may also be influenced by these abiotic factors. On the other hand, geographic variations of flower size have often been reported to reflect selection pressure by regional pollinator fauna. This suggests that flower size may change altitudinally in response to the size of pollinators.

Campanula punctata var. *hondoensis* is distributed over a broad altitudinal range, and their pollinator composition is known to be different along altitude. Thus, the selection pressure by pollinators may differ among altitudes.

Here, we investigate the pollinator fauna, flower size variation and gene flow along altitudinal gradient and found that 1. the composition of *Bombus* pollinators changes along altitude, 2. the flowers are basically smaller in higher altitudes while plant height or the number of flowers per plant does not change along altitude, 3. the flower size along altitudinal gradient correlates closely with pollinator size, 4. microsatellite analyses suggest no genetic differentiation along altitude.

These results suggest that flower size variation along altitude is influenced by the pollinators' selection pressure, and is maintained even in the presence of gene flow.

Keywords: flower size, pollinator, gene flow, altitude, natural selection