論文の内容の要旨

Molecular Developmental Analysis of the Unique Development of a One-leaf Plant in the Genus *Monophyllaea*
（モノフィレア属における一葉植物の特異な発生様式に関する分子発生生物学的解析）

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Plants in the genus *Monophyllaea* in Gesneriaceae are called one-leaf plants. This is because one of the two cotyledons, whose size is identical just after germination, grow indeterminately and does not produce new organs in the vegetative phase leading to the appearance of harboring only one leaf. This development is contrasting to that of typical seed plants where organs are produced indeterminately while each lateral organ grows determinately. One-leaf plants are also found in the genus *Streptocarpus* in Gesneriaceae. Although these two genera are distantly related, how they develop is similar to each other. The uniqueness of the development of one-leaf plants has attracted botanists for more than 150 years, thus the developmental process and the tissue structure have been investigated in detail. Special terms to describe the unique body plan and tissues in one-leaf plants have also been established. Moreover, regarding *Streptocarpus*, the molecular background of the unique development has been investigated using species of one-leaf plants and related species. However, in terms of *Monophyllaea*, there are few previous studies investigating the molecular background in part due to the lack of applicable experimental methods. Therefore, I established bases for the molecular research on *M. glabra*, a species in the genus *Monophyllaea*, and by using the bases, I investigated the expression patterns of key genes known to be involved in the basic development of typical plants. Physiological experiments were also performed to investigate the involvement of phytohormones. As a result, I revealed that the meristematic tissues of *M. glabra* are likely to have unique nature different from that of typical plants from molecular aspects. Moreover, from the results, the nature of the tissues is suggested to be considerably different from that of one-leaf plants and related species in one-leaf plants. A new model explaining underlying molecular mechanisms of the fate determination of two cotyledons is also proposed based on the results obtained under a newly established experimental system and careful observation.