

Title	セイヨウアサガオの子葉篩管液による花成制御(博士論文要旨 (English))
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Citation	
Issue Date	2016-12-06
URL	http://hdl.handle.net/10232/29241

学 位 論 文 要 旨	
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題 目	Control of flowering by phloem exudate from cotyledons of <i>Ipomoea tricolor</i> (セイヨウアサガオの子葉篩管液による花成制御)
<p>In short-day (SD) plants, when the day length is shorter than the critical dark period, flowering is induced. And it is also known that flowering inhibited by non-induced flowering leaves. This is considered that flower-inducing and/or -inhibiting substances are generated in the leaves and cotyledons. It is presumed that these substances synthesized in leaves and cotyledons has been transmitted though phloem to apical meristem. Therefore, it is considered that phloem exudate contains these substances.</p> <p>In the present study, we have partially purified the flower-inducing and -inhibiting substances in phloem exudate (PE) prepared from cotyledons of <i>Ipomoea tricolor</i>, and their nature was examined.</p> <p>The SD-PE (PE prepared from the cotyledons of <i>I. tricolor</i> seedlings that have been exposed to a single 16 h dark period) induced flowering in cultured apices excised from non-induced flowering seedlings. When the SD-PE was dialyzed and separated to 3 fractions such as low (LMW; <1,000), middle (MMW; 1,000-10,000), and high (HMW; >10,000) molecular weight, both LMW and HMW fractions had flower-inducing activities, but not MMW fraction. From the result of further separated the LMW fraction, the substance(s) was heat-stable. From the results of solvent participation, ion exchange chromatography and fractionation by Sep-Pak C18 cartridge, the substance(s) was high polar and acidic, and the flower-inducing activity increased from 3- to 10-fold.</p> <p>The CL-PE (PE prepared from the cotyledons of <i>I. tricolor</i> seedlings cultivated to continuous light conditions) inhibited flowering in apices excised from SD treated seedlings to induce flowering. When the CL-PE was dialyzed and separated to LMW, MMW and HMW fractions, LMW fraction had flower-inhibiting activity, but not MMW and HMW fractions. From the result of further separated the LMW fraction, the substance(s) was heat-stable. From the results of solvent participation, ion exchange chromatography and fractionation by Sep-Pak C18 cartridge, the substance(s) was high polar and basic, and the flower-inhibiting activity increased about 10-fold.</p> <p>When the HMW fraction of SD-PE was treated with Proteinase K, the flower-inducing activity was disappeared. Therefore, HMW active substance(s) may be protein. When the HMW fraction was fractionated by gel filtration chromatography, the molecular weight of active fraction was ca. 23,000 Dalton, and the substance may be FT-like protein. Simultaneous addition of CL-PE to the HMW fraction inhibited flower-inducing activity.</p> <p>Flowering may be controlled by correlation between HMW FT-like protein and LMW flower-inducing and/or -inhibiting substances in <i>I. tricolor</i>.</p>	