Isolation and Identification of Poplar Isoplastocyanins

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An improved four-stage isolation and purification procedure for preparing poplar isoplastocyanins is described in detail. Absorbance (UV-VIS) spectroscopy and isoelectric focusing (IEF) are used to determine the protein purity and identity. The present procedure increases twice the total plastocyanin (PC) yield. Four PC isoform fractions are consecutively isolated at the third chromatographic step: oxidized PC*a*(II) and PC*b*(II) and reduced PC*b*(I) and PC*a*(I). PC*a*(II) and PC*b*(II) obtained at the fourth chromatographic step are highly purified PC isoforms which show the purity index (*p.i.*) A_{278}/A_{597} Ω 0.85. Isoelectric points (p*I* values) of the PC isoforms are found to be at pH 3.92 ± 0.04 for PC*a* and at pH 3.85 ± 0.02 for PC*b*. The results of appropriate biological experiments that include the highly purified poplar PC isoforms could give answers to the questions about the physiological significance of PC dimorphism for photosynthesis.

Key words: Photosynthesis, Plastocyanin, Dimorphism