Seasonality of chlorophyll b presence in core complexes of photosystem II from higher plants. A role of photoprotection?

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Using two distinct and separate detergent solubilisation procedures, and Fast Phase Liquid Chromatography, a protocol for the isolation of the fully functional Core Complex of Photosystem II from higher plant spinach has been defined (Smith *et al.*, 2002). More recently, examination of Core Complexes prepared using alternative higher plant species, capsicum and silverbeet, and from spinach grown at different seasons (January – mid summer – and July – mid winter) has been undertaken. The seasonal variations for spinach were marked, with differences in capability of separating the Core Complex from Inner Light Harvesting peptides discovered. Core complexes from winter grown spinach were found to contain very low levels of chlorophyll b, indicative of rapid and efficient solubilisation of CP26 and CP29 from the Core complex using dodecyl-b-D maltoside. Cores isolated from summer grown spinach retained significant levels of chlorophyll b, indicative of a stronger interaction between CP26 and CP29 and the Core complex. Other higher plant species, typically harvested from summer grown plant material, were found to retain significant levels of chlorophyll b. This initial report characterises biochemical and biophysical parameters associated with Photosystem II core complexes and forwards an hypothesis for retention of CP26 and CP29 in summer grown higher plants, these chlorophyll containing peptides being retained for a photoprotective role.

Smith PJ, Peterson S, Masters VM, Wydrzynski T, Styring S, Krausz E & Pace RJ. (2002) *Biochemistry*, **41:** 1981-9.