Abstract

Models of photosynthetic physiology have typically been parameterised by classical enzyme kinetics assays and gas exchange measurements in model species.

To create models that better reflect how plants do photosynthesis in nature, we need information about how the abundance of photosynthetic enzymes in leaves varies on ecological scales: among many species and across broad gradients of environmental conditions.

We have developed methods that allow comprehensive extraction of leaf proteins and precise determination of their abundance using mass spectrometry, for many samples. We used this new approach to quantify leaf proteins in field-collected samples of 30+ species of *Eucalyptus* from sites spanning broad ranges of temperature and rainfall.

We found that the proportional abundance of photosystem proteins declined strongly with increasing light availability rainfall. Proportional abundance of proteins involved in the Calvin cycle varied widely and responded only weakly to environmental conditions.