Package: photosynthesisLRC (via r-universe)

October 5, 2026

Type Package

Title NLS Models for Photosynthetic Light Response

Version 0.1.0

Depends R (>= 2.10), tidyr(>= 1.3.1)

Description This package was made for researchers to 1) easily construct light response curves, 2) compare different photosynthetic models with their data, and 3) extract photosynthetic traits from light response curves. The package allows users to test their data with mechanistic and empirical models like the rectangular hyperbola Michaelis-Menton based models ((eq1 (Baly (1935) <DOI 10.1098/rspb.1935.0026>)) (eq2 (Kaipiainenn (2009) <DOI 10.1134/S1021443709040025>)) (eq3 (Smith (1936) <DOI 10.1073/pnas.22.8.504>))), hyperbolic tangent based models ((eq4 (Jassby & Platt (1976) <DOI 10.4319/LO.1976.21.4.0540>)) (eq5 (Abe et al. (2009) <DOI 10.1111/j.1095-921X.2009.00253.x>))), the non-rectangular hyperbola model (eq6 (Prioul & Chartier (1977) <DOI 10.1093/oxfordjournals.aob.a085354>)), exponential based models ((eq8 (Webb et al. (1974) <DOI 10.1007/BF00345747>)), (eq9 (Prado & de Moraes (1997) <DOI 10.1007/BF02982542>))), and finally the Ye model (eq11 (Ye (2007) <DOI 10.1007/s11099-007-0110-5>)). The capacity for each of these nonlinear least squares models to express photosynthetic response under changing light conditions has been well described and supported in the literature but distinctions in each mathematical model represent moderately different assumptions about physiology and trait relationships which will ultimately produce different calculated functional trait values. These models were all thoughtfully discussed and curated by Lobo et al. (2013) <DOI 10.1007/s11099-013-0045-y> to express the importance of selecting an appropriate model for analysis. Each model can be easily tested and compared with this package to ensure accurate evaluations of light response, which is particularly useful in systems without an established photosynthetic model. To establish a model of best fit, this

package includes functions to rapidly test your data with each model equation, a function to efficiently store all results in an array, and a plotting function to visualize differences in how each model represents the photosynthetic light response. Methods were established in Davis et al. (2024) <DOI ???????> to evaluate the impact of analytical choice in a phylogenetic analysis of the function-valued trait, and the gas exchange data on 28 sunflower species from that study are included as a play data set here.

License use_mit_license()

Encoding UTF-8

LazyData true

Author Rebekah Davis & Eric Goolsby

Maintainer Rebekah Davis <rebekahamhsi@gmail.com>

Reponsitory CRAN

RoxygenNote 7.3.1

Config/pak/sysreqs libicu-dev

Repository https://heliotropichuman.r-universe.dev

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