Package: photosynthesisLRC (via r-universe)

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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

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Reponsitory CRAN

RoxygenNote 7.3.1

Config/pak/sysreqs libicu-dev

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

RemoteUrl https://github.com/heliotropichuman/photosynthesislrc

RemoteRef HEAD

RemoteSha 9714447e639ed16dab0e77099131e4c921127a95