In the first instance, simple linear models with centred incubation time (*t* – , min) as the predictor and dissolved O2 (µM) as the response variable were fit to measurements from each sample and blank incubation. This yielded posterior probability distributions for slopes (*β*, µM min–1) which were converted to mass-based *P*max (µmol g–1 h–1) as

(1)

where subscriptsandb denote sample and blank incubations from the same measurement group, *V* is the incubation volume (175 ± 0.17 mL) in litres, *m* is the sample blotted mass (0.52 ± 0.23 g) in grams and *Δt* is the desired period (60 min h–1) in minutes.

To predict *P*max with detrital age (*A*, d), I chose a logistic regression of the form

(2)

where *α* is baseline photosynthesis (µmol g–1 h–1), *τ* is the community oxygen consumption of dead detritus (µmol g–1 h–1), *k* is the logistic rate of decay (d–1) and *µ* is the midpoint of photosynthetic death (d). The naming of parameters is inspired by the Hebrew word אמת (graecised τμα) which means truth and is composed of the first, middle and last letters of the Hebrew alphabet, symbolising life (א), transition (מ) and death (ת). Inscribed on the golem’s brow this word lends life, but removing א changes the meaning from truth to death (מת) and the golem dies. As in the story of the golem, the logistic function is optimal for modelling a shift between two alternate states and is thus the logical choice here. I previously modelled detrital photosynthesis with linear regressions instead, because data either did not span enough timepoints to inform a more complex model (Wright *et al.*, 2022) or macroalgal tissue

Data were collated into variables Reference, DOI, Group, Phylum, Order, Family, Species, Light, Water, Series, Day, Mean, SEM, N, Response, Method, Unit and Source. Some of these are self-explanatory, but most are not. Group classes observations into four non-taxonomic groups of interest: terrestrial plants (66 species), freshwater plants (6 species), seagrasses (5 species) and seaweeds (15 species). It is noteworthy that all freshwater plants belonged to the order Alismatales, like seagrasses, and all seaweeds belonged to the green and brown algae (Table S1). My distinction between freshwater and terrestrial plants is based on whether or not the leaves are submerged. There were no studies on freshwater macroalgae, so seaweeds are presumed to be representative. Phylum, Order, Family and Species represent the currently accepted taxonomy according to Plants of the World Online (POWO, 2025) and AlgaeBase (Guiry and Guiry, 2025). Light and Water are binary classifiers of whether or not the experimental plant tissue had access to light or water. Series numbers the measurement timeseries within a given study since most studies reported several experiments, response variables, species or individuals. Only measurement series with at least three timepoints were accepted. Day is the time post-excision given in d (, , ). Mean is either an observation or the mean of several observations at a given timepoint. When the case is the latter, SEM and N are the standard error of the mean (s.e.m.) and its sample size (n). Uncertainty was mostly given as s.e.m., but when s.d. was provided instead, this was converted as . In a few cases uncertainty was given as a 95% confidence interval (CI) or interquartile range (IQR). In the former case, I converted as , in the latter I assumed mean = median and conservatively converted the larger of the two quartile ranges (Q3 − Q2 or Q2 − Q1) as . Response dichotomises data into photosynthesis and chlorophyll measurements since these measures are decoupled and probably senesce on different timescales. Method details how the response variable was measured, Unit provides the original response unit, and Source directs the reader to the data source in the paper. Please refer to the data publication {Wright, 2025, #81143} and github.com/lukaseamus/detrital-photosynthesis for further details.

The resulting 535 measurement series contained a mixture of observations and means. To jointly analyse data with such different levels of uncertainty one must either condense observations to means and s.e.m. or s.d. and build a measurement error model or expand means to observations. I opted for the latter and obtained 10566 observations by simulating draws from the normal distribution using rnorm( N , Mean , SEM \* sqrt(N) ) in R (R Core Team, 2025), or mathematically . Prior to analysis, I normalised observations to proportions by dividing by the initial observation or mean of initial observations in the timeseries. This was the favourable choice as opposed to min-max normalisation, since many detrital photosynthesis data already come expressed as % or proportion of initial. The drawback is that data aren’t fully brought onto the same scale because some variables allow negative proportions (e.g. net gas exchange) while most don’t (e.g. Chl, Fv/Fm etc.). I assume that the effect of this on the outcome of the analysis is minimal due to the relative scarcity of net gas exchange data and enforcing *τ* = 0 (Equation 2).