

Metadata S1

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Copepods true colors: astaxanthin pigmentation as an indicator of individual fitness

Journal name: Ecological Monographs

- Description of:

Data S1. List of all the publications that discussed and/or quantified carotenoid pigmentation in copepods

This dataset identifies all studies that contained the words “*copepod*” associated with “*carotenoid**”, “*astaxanthin*” or “*redness*” anywhere in the text body.

- Column details:

study, year, order: name of authors, year of publication, and we added the column “order” with letters a, b or c if authors published several articles in a year

study_type: we distinguished different types of studies according to the overall objective in relation to copepod carotenoids:

- no quantification: authors observed or discussed pigmentation in copepods but did not quantify it; this type can be added to other types (ex: redness+fitness and no_quantification)
- pigment identification: carotenoids forms were identified and/or quantified (ex. by HPLC) but without any additional experiments
- forcing variables: carotenoids were quantified and tests about effects of forcing variables on carotenoid pigmentation were performed (ex. temperature, UV radiations, etc)
- diet effect: effect of the diet on carotenoid pigmentation were tested
- redness + fitness: tests of the influence of pigmentation on fitness-related variables (ex. % of survival)
- forcing variables and redness + fitness: studies with both tests of forcing variables effects on pigmentation, and pigmentation influence on copepod fitness
- methodology: new methodologies tested to quantify or use copepod pigmentation

- Studies belonging to the “forcing variables” type were then used in Data S3
- Studies belonging to the “redness + fitness” type were then used in Data S4

latitude (°N), longitude (°E): latitude and longitude of copepod samplings, as described in articles

ecosystem: freshwater or marine

altitude (m): altitude above sea level for freshwater ecosystems
this information is generally provided in articles, otherwise it was searched on the web

sampling_months: month(s) of copepod sampling
if several, they are separated by an underscore

genus: copepod genus of the individual whose pigmentation was quantified
mixed = *if several genus present*

species: copepod species of the individual whose pigmentation was quantified:
“mixed” or separated by a comma = *if several species were present*

stage: copepod stages
adults_females, adults_males, adults_females_eggs (= *adults females with eggs*), copepodits, nauplii, eggs, mixed (= *if several stages*)

astaxanthin_or_carotenoids: type of pigments quantified in the article:
carotenoids = *all carotenoids (ex. mix of canthaxanthin, echinenone, astaxanthin..)*
astaxanthin = *only astaxanthin*
NA = *no information*

astaxanthin_on_total_car: part of astaxanthin content on total carotenoid content:
percentage (*if given by authors*)
dominance or minority (*as mentioned in the text by authors*)
NA (*if nothing specified*)

asta_form: free form, esters (all), monoesters or diesters:
percentage (*if given by authors*)
dominance or minority (*if mentioned in the text by authors*)
NA (*if nothing specified*)

- Studies that detailed carotenoids forms (18 articles) were then used in Data S2 for more precise analyses

concentration: concentration of carotenoids for each combination
latitude/longitude/altitude/genus/species/stage;
if several measures were performed, the mean concentration was calculated;
if necessary, information was estimated from graphs

unit: unit of pigment concentration
mostly ug/mgDW (= $\mu\text{g/mgDW}$)

unit_conversion: if values were transformed in order to be expressed in $\mu\text{g/mgDW}$, details of calculations in Appendix S1: Table I

daily_pic_moment:
if daily variations in pigmentation were observed, we reported it here, examples:
max morning (= *maximum pigmentation in the morning*)
min day, max night (= *minimum pigmentation during the day, maximum in the night*)
max midnight, min sunrise (= *maximum pigmentation at midnight, minimum at sunrise*)

seasonal_pic_season, seasonal_pic_month:

if seasonal variations in pigmentation were observed, we reported the season of the maximum (winter, spring, summer or autumn) and the month of the maximum
be careful, some studies were done in the southern hemisphere

predator_abundance:

estimation of predator abundance in freshwater ecosystems (high, low, or null) according to the discussion of authors, or research of lake information on the web

blue_color: mentioning of the observation of blue individuals (yes or no)

comments:

Any interesting/important information from the article

Notably: we reported here if canthaxanthin was found in copepods, or if blue coloration was mentioned