| **Checklist item** | **Item score** | **Sub-item number** | **Sub-item** | **Reported by authors?** | **Notes** |
| --- | --- | --- | --- | --- | --- |
| **Title and abstract** | **83%** | 1.1 | Identify the review as a systematic review, meta-analysis, or both | Yes |  |
|  |  | 1.2 | Summarise the aims and scope of the review | Yes |  |
| 1.3 | Describe the data set | Yes |  |
| 1.4 | State the results of the primary outcome | Yes |  |
| 1.5 | State conclusions | Yes |  |
| 1.6 | State limitations | No |  |
| **Aims and questions** | **100%** | 2.1 | Provide a rationale for the review | Yes |  |
|  |  | 2.2 | Reference any previous reviews or meta-analyses on the topic | Yes |  |
| 2.3 | State the aims and scope of the review (including its generality) | Yes |  |
| 2.4 | State the primary questions the review addresses (e.g. which moderators were tested) | Yes |  |
| 2.5 | Describe whether effect sizes were derived from experimental and/or observational comparisons | Yes | In Supp |
| **Review registration** | **25%** | 3.1 | Register review aims, hypotheses (if applicable), and methods in a time-stamped and publicly accessible archive and provide a link to the registration in the methods section of the manuscript. Ideally registration occurs before the search, but it can be done at any stage before data analysis. | No |  |
|  |  | 3.2 | Describe deviations from the registered aims and methods | Yes | In electronic supplementary material |
| 3.3 | Justify deviations from the registered aims and methods | Yes | In electronic supplementary material |
| **Eligibility criteria** | **100%** | 4.1 | Report the specific criteria used for including or excluding studies when screening titles and/or abstracts, and full texts, according to the aims of the systematic review (e.g. study design, taxa, data availability) | Yes | In electronic supplementary material |
|  |  | 4.2 | Justify criteria, if necessary (i.e. not obvious from aims and scope) | not applicable |  |
| **Finding studies** | **100%** | 5.1 | Define the type of search (e.g. comprehensive search, representative sample) | Yes | In electronic supplementary material |
|  |  | 5.2 | State what sources of information were sought (e.g. published and unpublished studies, personal communications) | Yes | In electronic supplementary material and main text |
| 5.3 | Include, for each database searched, the exact search strings used, with keyword combinations and Boolean operators | Yes | In electronic supplementary material |
| 5.4 | Provide enough information to repeat the equivalent search (if possible), including the timespan covered (start and end dates) | Yes | In electronic supplementary material |
| **Study selection** | **100%** | 6.1 | Describe how studies were selected for inclusion at each stage of the screening process (e.g. use of decision trees, screening software) | Yes | In electronic supplementary material |
|  |  | 6.2 | Report the number of people involved and how they contributed (e.g. independent parallel screening) | Yes | In electronic supplementary material |
| **Data collection process** | **100%** | 7.1 | Describe where in the reports data were collected from (e.g. text or figures) | Yes | In electronic supplementary material |
|  |  | 7.2 | Describe how data were collected (e.g. software used to digitize figures, external data sources) | Yes | In electronic supplementary material and main text |
| 7.3 | Describe moderator variables that were constructed from collected data (e.g. number of generations calculated from years and average generation time) | Yes | In electronic supplementary material and main text |
| 7.4 | Report how missing or ambiguous information was dealt with during data collection (e.g. authors of original studies were contacted for missing descriptive statistics, and/or effect sizes were calculated from test statistics) | Yes | In electronic supplementary material and metadata |
| 7.5 | Report who collected data | Yes | In electronic supplementary material and metadata |
| 7.6 | State the number of extractions that were checked for accuracy by co-authors | Yes | In electronic supplementary material |
| **Data items** | **100%** | 8.1 | Describe the key data sought from each study | Yes |  |
|  |  | 8.2 | Describe items that do not appear in the main results, or which could not be extracted due to insufficient information | Yes | In electronic supplementary material and main text |
| 8.3 | Describe main assumptions or simplifications that were made (e.g. categorising both 'length' and 'mass' as 'morphology') | Yes | In electronic supplementary material |
| 8.4 | Describe the type of replication unit (e.g. individuals, broods, study sites) | Yes | In electronic supplementary material and metadata |
| **Assessment of individual study quality** | **100%** | 9.1 | Describe whether the quality of studies included in the systematic review or meta-analysis was assessed (e.g. blinded data collection, reporting quality, experimental versus observational) | Yes | In electronic supplementary material |
|  |  | 9.2 | Describe how information about study quality was incorporated into analyses (e.g. meta-regression and/or sensitivity analysis) | Yes | In electronic supplementary material and main text |
| **Effect size measures** | **100%** | 10.1 | Describe effect size(s) used | Yes | In electronic supplementary material and main text |
|  |  | 10.2 | Provide a reference to the equation of each calculated effect size (e.g. standardised mean difference, log response ratio) and (if applicable) its sampling variance | Yes | In electronic supplementary material |
| 10.3 | If no reference exists, derive the equations for each effect size and state the assumed sampling distribution(s) | Yes | In electronic supplementary material |
| **Missing data** | **100%** | 11.1 | Describe any steps taken to deal with missing data during analysis (e.g. imputation, complete case, subset analysis) | Yes | In electronic supplementary material |
|  |  | 11.2 | Justify the decisions made to deal with missing data | Yes | In electronic supplementary material |
| **Meta-analytic model description** | **100%** | 12.1 | Describe the models used for synthesis of effect sizes | Yes | In electronic supplementary material and main text |
|  |  | 12.2 | The most common approach in ecology and evolution will be a random-effects model, often with a hierarchical/multilevel structure. If other types of models are chosen (e.g. common/fixed effects model, unweighted model), provide justification for this choice | not applicable |  |
| **Software** | **75%** | 13.1 | Describe the statistical platform used for inference (e.g. R) | Yes | In electronic supplementary material and main text |
|  |  | 13.2 | Describe the packages used to run models | Yes | In electronic supplementary material and main text |
| 13.3 | Describe the functions used to run models | No | In electronic supplementary material and main text |
| 13.4 | Describe any arguments that differed from the default settings | not applicable |  |
| 13.5 | Describe the version numbers of all software used | Yes | In electronic supplementary material |
| **Non-independence** | **100%** | 14.1 | Describe the types of non-independence encountered (e.g. phylogenetic, spatial, multiple measurements over time) | Yes | In electronic supplementary material and main text |
|  |  | 14.2 | Describe how non-independence has been handled | Yes | In electronic supplementary material \ |
| 14.3 | Justify decisions made | Yes | In electronic supplementary material |
| **Meta-regression and model selection** | **100%** | 15.1 | Provide a rationale for the inclusion of moderators (covariates) that were evaluated in meta-regression models | Yes | In electronic supplementary material and main text |
|  |  | 15.2 | Justify the number of parameters estimated in models, in relation to the number of effect sizes and studies (e.g. interaction terms were not included due to insufficient sample sizes) | not applicable |  |
| 15.3 | Describe any process of model selection | Yes | In electronic supplementary material |
| **Publication bias and sensitivity analysis** | **100%** | 16.1 | Describe assessments of the risk of bias due to missing results (e.g. publication, time-lag, and taxonomic biases) | Yes | In electronic supplementary material |
|  |  | 16.2 | Describe any steps taken to investigate the effects of such biases (if present) | Yes | In electronic supplementary material and main text |
| 16.3 | Describe any other analyses of robustness of the results, e.g. due to effect size choice, weighting or analytical model assumptions, inclusion or exclusion of subsets of the data, or the inclusion of alternative moderator variables in meta-regressions | Yes | In electronic supplementary material |
| **Clarification of post hoc analyses** | **NaN%** | 17.1 | When hypotheses were formulated after data analysis, this should be acknowledged. | not applicable |  |
| **Metadata, data, and code** | **100%** | 18.1 | Share metadata (i.e. data descriptions) | Yes | In github repo |
|  |  | 18.2 | Share data required to reproduce the results presented in the manuscript | Yes | In github repo |
| 18.3 | Share additional data, including information that was not presented in the manuscript (e.g. raw data used to calculate effect sizes, descriptions of where data were located in papers) | Yes | In github repo |
| 18.4 | Share analysis scripts (or, if a software package with graphical user interface (GUI) was used, then describe full model specification and fully specify choices) | Yes | In github repo |
| **Results of study selection process** | **100%** | 19.1 | Report the number of studies screened | Yes | In electronic supplementary material and main text |
|  |  | 19.2 | Report the number of studies excluded at each stage of screening | Yes | In electronic supplementary material and main text |
| 19.3 | Report brief reasons for exclusion from the full text stage | Yes | In electronic supplementary material |
| 19.4 | Present a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)-like flowchart (www.prisma-statement.org). | Yes | In electronic supplementary material |
| **Sample sizes and study characteristics** | **100%** | 20.1 | Report the number of studies and effect sizes for data included in meta-analyses | Yes | In electronic supplementary material and main text |
|  |  | 20.2 | Report the number of studies and effect sizes for subsets of data included in meta-regressions | Yes | In electronic supplementary material and main text |
| 20.3 | Provide a summary of key characteristics for reported outcomes (either in text or figures; e.g. one quarter of effect sizes reported for vertebrates and the rest invertebrates) | Yes | In electronic supplementary material and main text |
| 20.4 | Provide a summary of limitations of included moderators (e.g. collinearity and overlap between moderators) | Yes | In electronic supplementary material and main text |
| 20.5 | Provide a summary of characteristics related to individual study quality (risk of bias) | Yes | In electronic supplementary material and main text |
| **Meta-analysis** | **100%** | 21.1 | Provide a quantitative synthesis of results across studies, including estimates for the mean effect size, with confidence/credible intervals | Yes | In electronic supplementary material and main text |
| **Heterogeneity** | 22.1 | Report indicators of heterogeneity in the estimated effect (e.g. I2, tau2 and other variance components) | Yes | I2 In electronic supplementary material and main text |
| **Meta-regression** | **67%** | 23.1 | Provide estimates of meta-regression slopes (i.e. regression coefficients) and confidence/credible intervals | No | In electronic supplementary material and main text |
|  |  | 23.2 | Include estimates and confidence/credible intervals for all moderator variables that were assessed (i.e. complete reporting) | Yes | In electronic supplementary material and main text |
| 23.3 | Report interactions, if they were included | not applicable |  |
| 23.4 | Describe outcomes from model selection, if done (e.g. R2 and AIC) | Yes | In electronic supplementary material |
| **Outcomes of publication bias and sensitivity analysis** | **50%** | 24.1 | Provide results for the assessments of the risks of bias (e.g. Egger's regression, funnel plots) | Yes | In electronic supplementary material and main text |
|  |  | 24.2 | Provide results for the robustness of the review's results (e.g. subgroup analyses, meta-regression of study quality, results from alternative methods of analysis, and temporal trends) | No | In electronic supplementary material |
| **Discussion** | **100%** | 25.1 | Summarise the main findings in terms of the magnitude of effect | Yes | In electronic supplementary material and main text |
|  |  | 25.2 | Summarise the main findings in terms of the precision of effects (e.g. size of confidence intervals, statistical significance) | Yes | In electronic supplementary material and main text |
| 25.3 | Summarise the main findings in terms of their heterogeneity | Yes | In electronic supplementary material and main text |
| 25.4 | Summarise the main findings in terms of their biological/practical relevance | Yes | Main text |
| 25.5 | Compare results with previous reviews on the topic, if available | Yes | Main text |
| 25.6 | Consider limitations and their influence on the generality of conclusions, such as gaps in the available evidence (e.g. taxonomic and geographical research biases) | Yes | In electronic supplementary material and main text |
| **Contributions and funding** | **100%** | 26.1 | Provide names, affiliations, and funding sources of all co-authors | Yes | Main text |
|  |  | 26.2 | List the contributions of each co-author | Yes | Main text |
| 26.3 | Provide contact details for the corresponding author | Yes | Main text |
| 26.4 | Disclose any conflicts of interest | Yes | Main text |
| **References** | **100%** | 27.1 | Provide a reference list of all studies included in the systematic review or meta-analysis | Yes | In reference list in main text indicated with \*\*\* and in metadata |
|  |  | 27.2 | List included studies as referenced sources (e.g. rather than listing them in a table or supplement) | Yes | In reference list in main text indicated with \*\*\* |