Journal of Applied Phycology

# Submission and Formatting Guide

*Last update: March 2022*

Journal website

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## Manuscript Submission

Submission of a manuscript implies: that the work described has not been published before; that it is not under consideration for publication anywhere else; that its publication has been approved by all co-authors, if any, as well as by the responsible authorities – tacitly or explicitly – at the institute where the work has been carried out. The publisher will not be held legally responsible should there be any claims for compensation.

## Permissions

Authors wishing to include figures, tables, or text passages that have already been published elsewhere are required to obtain permission from the copyright owner(s) for both the print and online format and to include evidence that such permission has been granted when submitting their papers. Any material received without such evidence will be assumed to originate from the authors.

## Online Submission

Carefully proofread your manuscript (including the references) before submission.

Please use the online submission system to upload all of your manuscript files following the instructions given on the screen.

Please ensure you provide all relevant editable source files. Failing to submit these source files might cause unnecessary delays in the review and production process.

## Article Types

**Research:** the manuscript should have the following sections:

- Introduction
- Materials & Methods
- Results
- Discussion

NOTES

- Results and discussion should NOT be combined, except possibly in 'Short Notes'.
- In the introduction state your aims clearly

**Review**

NOTE: Former "Concise reviews CSI" should be submitted as "Review".

**Brief Report**

**Methodology**

## Species and Species Names

In the *Journal of Applied Phycology* we try to use the currently accepted names for species. These can be checked on the Algaebase Web site : http://www.algaebase.org/

For all cultures the strain number and the source of the strain must be provided.

See also Utilization of plants, algae, fungi

## Units and Formatting of Units

- The Journal of Applied Phycology uses only metric (SI) units.
- This includes the use of the metric tonne (the abbreviation is "t"). NOTE: the UK ton is equivalent to 1,016 kg, the US ton is equivalent to 907 kg, whereas the metric tonne is 1000 kg
- In this journal we use L for liter (i.e. mL, µL etc) not l.
- Units must be written using the exponential format: i.e. mg $L^{-1}$ not mg/L
- The correct unit for irradiance is µmol photons $m^{-2}$ $s^{-1}$ (note this is the same as is µE $m^{-2}$ $s^{-1}$ but the use of Einsteins is discouraged). The irradiance is assumed to be measured over the PAR range (i.e. 400 – 700 nm) and, if not, please indicate this clearly. Lux is not a unit of irradiance, but of illuminance, and is not applicable in plant sciences. Although lux can be converted to mol photons this conversion is dependent on the light source and the conversion is only very approximate.

- For dates use the following format: Day Month Year (i.e. 11 June 2012 or 12 Jun 2012). This avoids the potential problems with other date formats which are not consistent between countries.

## Statistical and Error Bars

Seeking the advice of a statistician is highly recommended.

The statistical methods used in analysis of the data must be clearly and fully described. Just stating which software package you used is not informative. Please use the checklist at the end of this section.

- When indicating the variation in data (i.e. mean ± ????) always indicate clearly what the numbers after the ± indicate (i.e. standard error, standard deviation, range, confidence interval etc) and also indicate what is *n*, the number of independent samples used to calculate these. This is particularly important in Tables and Figures. It is essential that *n* (the number of independent [biological] replicates) is carefully distinguished from the number of technical replicates, which refers to repetition of measurement on one individual in a single condition, or multiple measurements of the same or identical samples.

- Small sample sizes (less than 10) are an important issue in many biological studies. This results in low statistical power and thus also reduces the likelihood that a statistically significant result reflects a true effect. It is recommended that for sample sizes less than 5 all data points are shown or that you show the mean and the range rather than the mean and standard deviation.

- When giving the results of a statistical test ensure that it is clear which test was used. For t-tests state whether the test was one-tailed or two-tailed. For ANOVA results provide the F value together with the degrees of freedom and the p value (see Statistical Checklist below). For *p*-values greater than 0.001 it is best to give the actual *p*-value (see statistical checklist below).

- When using ANOVA indicate that you have checked that the data have met the assumptions of normality and homogeneity of variance (homoscedasticity) and/or whether the data were transformed.
- Beware of over-interpreting or misinterpreting *p* values - a common problem (see Nuzza 2014). Consider also reporting effect sizes and confidence intervals. See: *Nuzza R. (2014) Statistical errors. P values, the 'gold standard' of statistical validity, are not as reliable as many scientists assume. Nature 506:150-152.* [http://www.nature.com/news/scientific-method-statistical-errors-1.14700](http://www.nature.com/news/scientific-method-statistical-errors-1.14700)
- *An excellent paper on the correct use of error bars is: Cumming G, Fidler F, Vaux DL (2007) Error bars in experimental biology. J Cell Biol 177: 7-11.* [http://jcb.rupress.org/content/177/1/7.full](http://jcb.rupress.org/content/177/1/7.full)

## Checklist for Statistical Reporting

The following information must be available in all relevant Figure and Table legends (or Materials and Methods section if too long):

- The exact sample size (n) for each experimental group/condition, given as a number, not a range
- A description of the sample collection allowing the reader to understand whether the samples represent technical or biological replicates (including how many cultures, thalli, etc.);
- A statement of how many times the experiment shown was replicated in the laboratory;
- How was the sample size chosen to ensure adequate power to detect a pre-specified effect size?
- Definitions of statistical methods and measures: (For small sample sizes (n<5) descriptive statistics are not appropriate, instead it is better to plot individual data points)
    - very common tests, such as t-test, simple $\chi 2$ tests, Wilcoxon and Mann-Whitney tests, can be unambiguously identified by name only, but more complex techniques should be described in the methods section;
    - are tests one-sided or two-sided?
    - are there adjustments for multiple comparisons?
    - statistical test results, e.g., *P* values; (it is preferable to report the actual *p*-value, unless $p<0.001$)
    - definition of 'center values' as median or mean (arithmetic mean is assumed, if using geometric mean state so);

- definition of error bars as s.d. or s.e.m. or c.i.

For reporting statistical tests, give full details of a result in the following way: state the test name, followed by a colon, then the test statistic (degrees of freedom), and the p-value associated with the test.

For example:

- t-test: t(49) = 2.10, $p = 0.041$;
- ANOVA: F(2,12) = 5.6, $p = 0.019$ or $F_{2,12} = 5.6$, $p = 0.019$
- Chi-squared: $\chi^2(22) = 19.34$, $p = 0.62$
- Pearsons Correlation Coefficient: r(425) = –.58, $p<0.001$
- Linear regression: F(1,23) = 25.87, $p = 0.049$, $R^2 = 0.694$

## Culture Media

Always provide a reference for the medium/media used. That reference should contain the actual composition of the medium. Note any changes you may have made from the medium described in that reference. If the medium is a new one, provide full details of the composition.

## Title Page

The title page should include:

**Title**

The title should be concise and informative

Author information

- The name(s) of the author(s)
- The affiliation(s) and address(es) of the author(s)
- The e-mail address of the corresponding author
- If available, the 16-digit ORCID of the author(s)

**Abstract**

Please provide an abstract of 150 to 250 words. The abstract should not contain any undefined abbreviations or unspecified references.

**Keywords**

Please provide 4 to 6 keywords which can be used for indexing purposes.

**Declarations**

All manuscripts must contain the following sections under the heading 'Declarations'.

If any of the sections are not relevant to your manuscript, please include the heading and write 'Not applicable' for that section.

**Funding** - information that explains whether and by whom the research was supported

**Competing interests** - see more details here.

**Availability of data and material** – see more details here.

**Code availability** - software application or custom code, if applicable

**Authors' contributions** – see more details here.

## Text

### Text Formatting

Manuscripts should be submitted in Word.

- Use a normal, plain font (e.g., 12-point Times Roman) for text.
- Use italics for emphasis.
- Use the automatic page numbering function to number the pages.
- Do not use field functions.
- Use tab stops or other commands for indents, not the space bar.
- Use the table function, not spreadsheets, to make tables.
- Use the equation editor or MathType for equations.
- Save your file in docx format (Word 2007 or higher) or doc format (older Word versions).

Manuscripts with mathematical content can also be submitted in LaTeX. We recommend using Springer Nature's LaTeX template.

### Headings

Please use no more than three levels of displayed headings. Avoid the use of an excessive number of sub-headings. It does not help clarity.

### Abbreviations

Abbreviations should be defined at first mention and used consistently thereafter.

### Footnotes

Footnotes should be avoided, but if necessary they can be used to give additional information, which may include the citation of a reference included in the reference list. They should not consist solely of a reference citation, and they should never include the bibliographic details of a reference. They should also not contain any figures or tables.

Footnotes to the text are numbered consecutively; those to tables should be indicated by superscript lower-case letters (or asterisks for significance values and other statistical data). Footnotes to the title or the authors of the article are not given reference symbols.

Always use footnotes instead of endnotes.

### Acknowledgments

Acknowledgments of people, grants, funds, etc. should be placed in a separate section on the title page. The names of funding organizations should be written in full.

# References

**Citation**

Cite references in the text by name and year in parentheses. Some examples:

- Negotiation research spans many disciplines (Thompson 1990).
- This result was later contradicted by Becker and Seligman (1996).
- This effect has been widely studied (Abbott 1991; Barakat et al. 1995a, b; Kelso and Smith 1998; Medvec et al. 1999, 2000).

**Reference list**

The list of references should only include works that are cited in the text and that have been published or accepted for publication. Personal communications and unpublished works should only be mentioned in the text. Do not use footnotes or endnotes as a substitute for a reference list.

Reference list entries should be alphabetized by the last names of the first author of each work. Order multi-author publications of the same first author alphabetically with respect to second, third, etc. author. Publications of exactly the same author(s) must be ordered chronologically.

The in-text citations should be arranged in year/author order.

Please carefully proofread your references. It is surprising how many errors and many unexpected problems can creep in when relying on downloads from journal web sites etc.

- Journal article

Barsanti L, Vismara R, Passarelli V, Gualtieri P (2001) Paramylon (β-1,3-glucan) content in wild type and WZSL mutant of *Euglena gracilis*. Effects of growth conditions. J Appl Phycol 13:59-65.

Kim SM, Jung YJ, Kwon ON, Cha KH, Um BH, Chung D, Pan CH (2012) A potential commercial source of fucoxanthin extracted from the microalga *Phaeodactylum tricornutum*. Appl Biochem Biotechnol 166:1843-1855.

Wayama M, Ota S, Matsuura H, Nango N, Hirata A, Kawano S (2013) Three-dimensional ultrastructural study of oil and astaxanthin accumulation during encystment in the green alga *Haematococcus pluvialis*. PLoS One 8:e53618.

- Article by DOI

Slifka MK, Whitton JL (2000) Clinical implications of dysregulated cytokine production. J Mol Med. https://doi.org/10.1007/s001090000086

- Book

South J, Blass B (2001) The future of modern genomics. Blackwell, London

- Edited Book

Borowitzka MA, Beardall J, Raven JA (eds) (2016) The physiology of microalgae. Springer, Dordrecht. p 681

- Book chapter

Craggs RJ, Lundquist TJ, Benemann JR (2013) Wastewater treatment and algal biofuel production. In: Borowitzka MA, Moheimani NR (eds) Algae for Biofuels and Energy. Springer, Dordrecht, pp 153-164.

- Online document

Guiry MD, Guiry GM (2016) AlgaeBase. World-wide electronic publication, National University of Ireland, Galway. http://www.algaebase.org; accessed 5 April 2017

- Dissertation

Lyczkowski ER (2012) Assessing allelopathic effects of *Alexandrium fundyense* on *Thalassiosira* sp. MSc Thesis, University of Maine, USA 108 pp

- Report

Sheehan J, Dunahay T, Benemann J, Roessler P (1998) A look back at the U.S. Department of Energy's Aquatic Species Program - Biodiesel from algae. Laboratory NRE, Golden, Colorado. NREL/TP-580-24190 pp 1-328

- Patent

Xue L, Pan W, Jiang G, Wang J (2003) Transgenic *Dunaliella salina* as a bioreactor. USA Patent 2003/0066107

Thomas SS, Swaminathan K, Nagaraj JB (2003) Process to produce astaxanthin from *Haematococcus* biomass. PCT Patent Application 03/027267

Always use the standard abbreviation of a journal's name. (the correct abbreviations can be found at http://library.caltech.edu/reference/abbreviations

If you are unsure, please use the full journal title.

## Tables

- All tables are to be numbered using Arabic numerals.
- Tables should always be cited in text in consecutive numerical order.
- For each table, please supply a table caption (title) explaining the components of the table.
- Identify any previously published material by giving the original source in the form of a reference at the end of the table caption.
- Footnotes to tables should be indicated by superscript lower-case letters (or asterisks for significance values and other statistical data) and included beneath the table body.

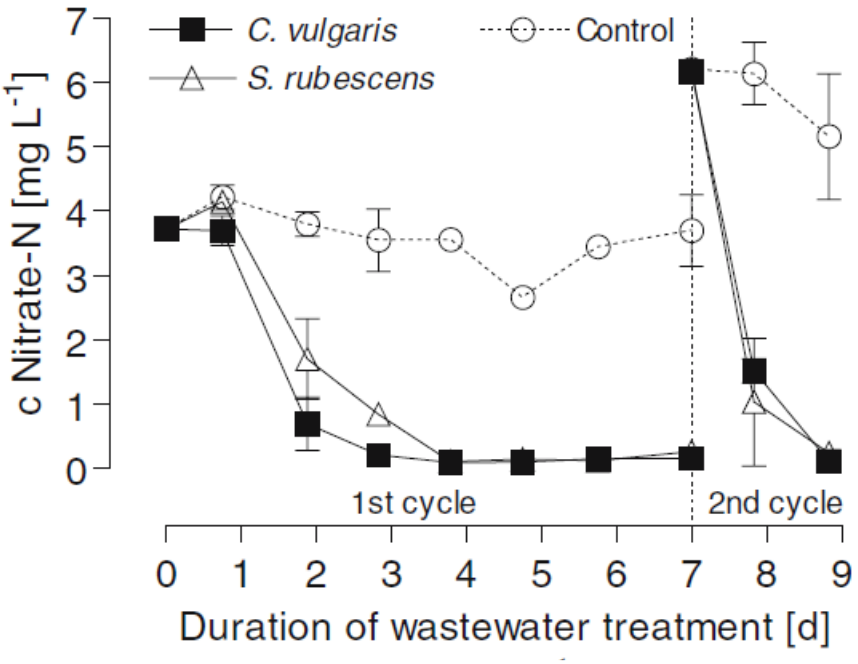
## Artwork and Illustrations Guidelines

**Electronic Figure Submission**

- Supply all figures electronically.
- Indicate what graphics program was used to create the artwork.
- For vector graphics, the preferred format is EPS; for halftones, please use TIFF format. MSOffice files are also acceptable.
- Vector graphics containing fonts must have the fonts embedded in the files.
- Name your figure files with "Fig" and the figure number, e.g., Fig1.eps.
- Please try to design your figures so they can be fitted into 1 column of the journal.

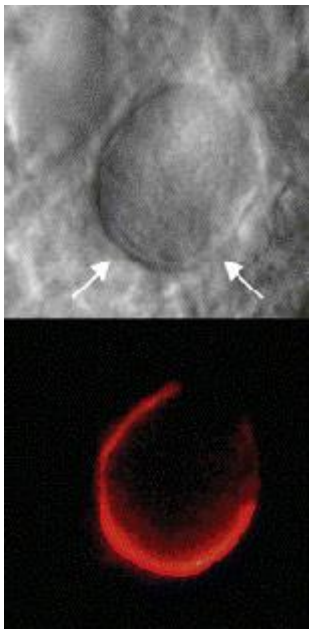
- Do not have an explanation of the symbols and/or lines as a separate element outside the figure. If possible, put this information in the figure legend, or try placing the explanation within the figure or below the figure.
- Avoid the use of colour, unless absolutely necessary for clarity.
- Avoid the use of complex fills in bar graphs. Plain black and white fills look much better. Avoid shading in bars.
- Only connect data points with curves if you are actually fitting a specific mathematical model. In all other cases you should use straight lines as these lines are only visual guides for the reader. Curves can be misleading.
- All light and electron micrographs must have easily visible scale bars.

**Line Art**



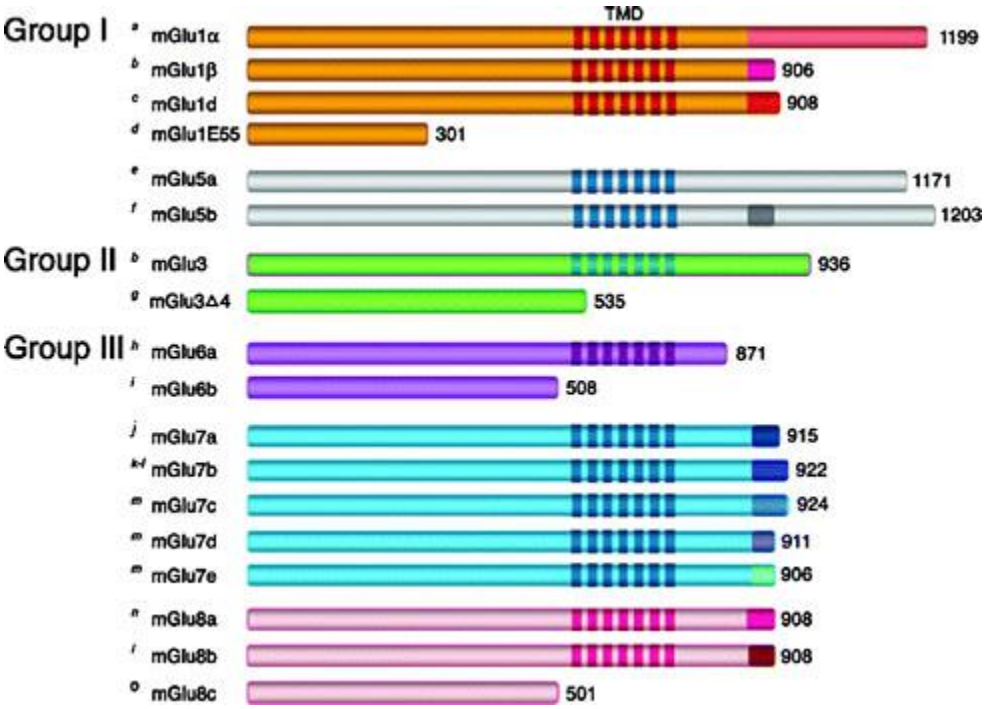

- Definition: Black and white graphic with no shading.
- Do not use faint lines and/or lettering and check that all lines and lettering within the figures are legible at final size.
- All lines should be at least 0.1 mm (0.3 pt) wide.
- Scanned line drawings and line drawings in bitmap format should have a minimum resolution of 1200 dpi.
- Vector graphics containing fonts must have the fonts embedded in the files.

**Halftone Art**



- Definition: Photographs, drawings, or paintings with fine shading, etc.
- If any magnification is used in the photographs, indicate this by using scale bars within the figures themselves.
- Halftones should have a minimum resolution of 300 dpi.

Combination Art




- Definition: a combination of halftone and line art, e.g., halftones containing line drawing, extensive lettering, color diagrams, etc.

Combination artwork should have a minimum resolution of 600 dpi.

**Color Art**

- Color art is free

- Color illustrations should be submitted as RGB (8 bits per channel).

**Figure Lettering**

- To add lettering, it is best to use Helvetica or Arial (sans serif fonts).
- Keep lettering consistently sized throughout your final-sized artwork, usually about 2–3 mm (8–12 pt).
- Variance of type size within an illustration should be minimal, e.g., do not use 8-pt type on an axis and 20-pt type for the axis label.
- Avoid effects such as shading, outline letters, etc.
- Do not include titles or captions within your illustrations.

**Figure Numbering**

- All figures are to be numbered using Arabic numerals.
- Figures should always be cited in text in consecutive numerical order.
- Figure parts should be denoted by lowercase letters (a, b, c, etc.).
- If an appendix appears in your article and it contains one or more figures, continue the consecutive numbering of the main text. Do not number the appendix figures, "A1, A2, A3, etc." Figures in online appendices (Electronic Supplementary Material) should, however, be numbered separately.

**Figure Captions**

- Each figure should have an informative concise caption describing accurately what the figure depicts. Include the captions in the text file of the manuscript, not in the figure file.
- Figure captions begin with the term Fig. in bold type, followed by the figure number, also in bold type.
- No punctuation is to be included after the number, nor is any punctuation to be placed at the end of the caption.
- Identify all elements found in the figure in the figure caption; and use boxes, circles, etc., as coordinate points in graphs.
- When showing error bars always indicate in the caption what they indicate (i.e. standard error, standard deviation, confidence interval, range etc) and also indicate what is *n*, the number of replicates used to calculate this.
- Identify previously published material by giving the original source in the form of a reference citation at the end of the figure caption.

**Figure Placement and Size**

- Figures should be submitted separately from the text, if possible.
- When preparing your figures, size figures to fit in the column width.
- The figures should be 174 mm (for double-column text areas), or 84 mm (for single-column text areas) wide and not higher than 234 mm.

**Permissions**

If you include figures that have already been published elsewhere, you must obtain permission from the copyright owner(s) for both the print and online format. Please be aware that some publishers do not grant electronic rights for free and that Springer will not be able to refund any costs that may have occurred to receive these permissions. In such cases, material from other sources should be used.

**Accessibility**

In order to give people of all abilities and disabilities access to the content of your figures, please make sure that

- All figures have descriptive captions (blind users could then use a text-to-speech software or a text-to-Braille hardware)
- Patterns are used instead of or in addition to colors for conveying information (colorblind users would then be able to distinguish the visual elements)
- Any figure lettering has a contrast ratio of at least 4.5:1

## Supplementary Information (SI)

Springer accepts electronic multimedia files (animations, movies, audio, etc.) and other supplementary files to be published online along with an article or a book chapter. This feature can add dimension to the author's article, as certain information cannot be printed or is more convenient in electronic form.

Before submitting research datasets as Supplementary Information, authors should read the journal's Research data policy. We encourage research data to be archived in data repositories wherever possible.

**Submission**

- Supply all supplementary material in standard file formats.
- Please include in each file the following information: article title, journal name, author names; affiliation and e-mail address of the corresponding author.
- To accommodate user downloads, please keep in mind that larger-sized files may require very long download times and that some users may experience other problems during downloading.
- High resolution (streamable quality) videos can be submitted up to a maximum of 25GB; low resolution videos should not be larger than 5GB.

**Audio, Video, and Animations**

- Aspect ratio: 16:9 or 4:3
- Maximum file size: 25 GB for high resolution files; 5 GB for low resolution files
- Minimum video duration: 1 sec
- Supported file formats: avi, wmv, mp4, mov, m2p, mp2, mpg, mpeg, flv, mxf, mts, m4v, 3gp

**Text and Presentations**

- Submit your material in PDF format; .doc or .ppt files are not suitable for long-term viability.

- A collection of figures may also be combined in a PDF file.

**Spreadsheets**

- Spreadsheets should be submitted as .csv or .xlsx files (MS Excel).

**Specialized Formats**

- Specialized format such as .pdb (chemical), .wrl (VRML), .nb (Mathematica notebook), and .tex can also be supplied.

**Collecting Multiple Files**

- It is possible to collect multiple files in a .zip or .gz file.

**Numbering**

- If supplying any supplementary material, the text must make specific mention of the material as a citation, similar to that of figures and tables.
- Refer to the supplementary files as “Online Resource”, e.g., "... as shown in the animation (Online Resource 3)", “... additional data are given in Online Resource 4”.
- Name the files consecutively, e.g. “ESM_3.mpg”, “ESM_4.pdf”.

**Captions**

- For each supplementary material, please supply a concise caption describing the content of the file.

**Processing of supplementary files**

- Supplementary Information (SI) will be published as received from the author without any conversion, editing, or reformatting.

**Accessibility**

- In order to give people of all abilities and disabilities access to the content of your supplementary files, please make sure that
- The manuscript contains a descriptive caption for each supplementary material
- Video files do not contain anything that flashes more than three times per second (so that users prone to seizures caused by such effects are not put at risk)

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