

# JOURNAL OF PARASITOLOGY POLICIES AND INSTRUCTIONS TO AUTHORS

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### POLICIES

#### Scope

The *Journal of Parasitology* is the official journal of the American Society of Parasitologists (ASP). The *Journal* is not-for-profit and dues of the membership support the cost of publication. Manuscripts in English are accepted from investigators in any country regardless of whether they are members of ASP. The *Journal* publishes official business of ASP and results of new, original, research dealing with helminths, protozoa, and other parasitic organisms.

#### Forms of publication

The *Journal* publishes reports of significant contributions to the permanent scientific record, primarily in the form of Regular Articles, Short Communications, and Review Articles. Critical comments, book reviews, and in memoria are published at the discretion of the editor.

The *Journal* **does** publish systematic and taxonomic papers dealing with helminths, protozoa and other parasitic organisms at all levels, including single-species descriptions.

The *Journal* **does not** publish papers that report limited extensions of known host or locality records, except cases in which the information impacts larger syntheses or critical issues in parasitology. Larger survey data sets for known species should be reported in the context of a Review Article.

*Regular articles:* Regular articles report self-contained original research dealing with parasitic organisms.

*Short communications:* Short Communications are concise reports of parasitological research that do not lend themselves to the format of a more comprehensive article. Short Communications should not be preliminary reports nor contain purely incremental data.

*Review articles:* Review articles synthesize or analyze the current state of knowledge on a topic based on an unbiased summary of previously published studies. Methods are not reported unless it is a systematic review or meta-analysis. A review article should be of sufficient breadth and accuracy to suggest and inform the most promising avenues for future research. Review articles may focus on concepts and theories, methodology and technique, host or parasite taxa, or other topics of parasitological interest.

*Critical comments:* Critical comments are for well-substantiated corrections of published information or conclusions, providing alternative interpretations of published data, or presenting new ideas based on published information.

*Book reviews:* Reviews of books having a broad interest to ASP members are published at the discretion of the editor.

### Conditions of submission

Manuscript submission to the *Journal of Parasitology* shall constitute the authors' certification of the following conditions:

*Authorship:* All authors meet the International Committee of Medical Journal Editors (ICMJE) criteria for authorship as follows (for clarification and background, see [www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html](http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html)):

- 1) Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; and,
- 2) Drafting the work or revising it critically for important intellectual content; and,
- 3) Final approval of the version to be published; and,
- 4) Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

*Conflict of interest:* All authors disclose conflicts of interest as recommended by the ICMJE ([www.icmje.org/recommendations/browse/roles-and-responsibilities/author-responsibilities-conflicts-of-interest.html](http://www.icmje.org/recommendations/browse/roles-and-responsibilities/author-responsibilities-conflicts-of-interest.html)). When authors submit a manuscript they are responsible for disclosing all financial and personal relationships that might bias or be seen to bias their work in an included explicit conflict of interest statement to be published with the article.

*Originality, sole consideration, and copyright:*

- 1) The work, results, and ideas presented are original.
- 2) The work has not been published previously.
- 3) The paper is not under consideration for publication elsewhere and will not be submitted elsewhere unless rejected by the *Journal of Parasitology* or withdrawn by written notification to the editor of the *Journal of Parasitology*.
- 4) If accepted for publication and published, the manuscript, or portions thereof, will not be published elsewhere unless consent is obtained in writing from the editor of the *Journal of Parasitology*.
- 5) If accepted for publication and published, the copyright is retained by ASP and permission to reprint articles in whole or part must be obtained in writing from the editor of the *Journal of Parasitology*.
- 6) If accepted for publication and published with payment of Open-Access Fees (US\$750 for ASP members and US\$1,000 for nonmembers), the copyright is retained by ASP and ASP grants a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International Public License for distribution and use of the article as described under CC BY-NC-ND 4.0 at [creativecommons.org/licenses/by-nc-nd/4.0/legalcode](http://creativecommons.org/licenses/by-nc-nd/4.0/legalcode).
- 7) Reproduction and fair use of articles in the *Journal of Parasitology* are permitted in accordance with the United

States Copyright Revision Law (PL94-533), provided the intended use is for nonprofit educational purposes. All other use requires consent and fees where appropriate.

*Research involving human participants and/or vertebrate animals:* It is the responsibility of authors to ensure that their practices conform to their national ethics guidelines for use of vertebrate animal and human subjects in research. Such studies should be approved by an institutional research ethics, human subjects, or animal use committee (where such a committee exists).

- 1) The use of animals obtained from natural populations must be in accordance with regulations and policies of appropriate international, federal, or state agencies.
- 2) The ASP conforms to the “U.S. Government Principles for the Utilization and Care of Vertebrate Animals Used in Testing, Research and Training.” Work involving vertebrate animals shall be conducted within the guidelines established by The American Association for Laboratory Animal Science (1989, *Laboratory Animal Science* 39: 267) or equivalent national or international standards (e.g., “European Convention for the Protection of Vertebrate Animals used for Experimental and Other Scientific Purposes”; “National Research Council Guide for the Care and Use of Laboratory Animals” [U.K.]).
- 3) The ASP recognizes that authors cannot always certify the conditions of provenance of archival specimens critical to the conduct of research. In such cases, one should assume compliance with contemporary ethical standards in the absence of evidence to the contrary.
- 4) For studies involving vertebrate animals, the following statement should be included as an initial line of the Acknowledgments: “The authors assert all applicable international, national, and/or institutional guidelines for the care and use of animals were followed.” Institutional ethics or animal care review board certification may be reported in a subsequent sentence at the author’s discretion.
- 5) The ASP conforms to the “U. S. Common Rule for the Treatment of Human Subjects” (as defined in the U.S. Code of Federal Regulations TITLE 45: Public Welfare, Department of Health and Human Services; PART 46: Protection of Human Subjects, revised January 15, 2009). Work involving human subjects shall be conducted within the guidelines established by the U. S. Common Rule for the Treatment of Human Subjects or similar national or international standards. All work involving human subjects shall comply with the World Medical Association’s “Declaration of Helsinki—Ethical Principles for Medical Research Involving Human Subjects of 1964” (as amended 2013).
- 6) For studies involving human subjects, the following statement should be included as an initial line of the Acknowledgments: “The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1964, as revised in 2013.” Institutional ethics or human subjects review board certification may be reported in a subsequent sentence at the author’s discretion.

*Page charges, redactory fees, and reprints:* The corresponding author accepts the obligation for page charges and redactory fees as follows.

- 1) There are no page charges when the corresponding author is a member of ASP at the time of publication; otherwise, US\$75/page.
- 2) Authors are allowed up to 5 proof alterations of text free of charge: each subsequent alteration costs US\$5. Authors are reminded that added or removed characters may necessitate other corrections. Figure replacements and changes to tables are billed at the printer’s current rate.
- 3) There is no additional charge for figures submitted and printed in black and white or grayscale. There is an additional charge for color plates of US\$75 for online color only (print version is grayscale); or, US\$500 for color in both online and print versions.
- 4) Charges to make articles open access are \$750 for ASP members and \$1,000 for nonmembers. Authors who opt for open access do not pay regular page charges. *Journal* articles are posted at the *Journal of Parasitology* website ([www.journalofparasitology.org](http://www.journalofparasitology.org)) and BioOne ([www.bioone.org](http://www.bioone.org)).
- 5) Nonmembers intending to publish in the *Journal of Parasitology* are encouraged to become members of the Society. (Visit [www.journalofparasitology.org](http://www.journalofparasitology.org) to join, membership includes both print and/or online options; student members receive a substantial discount).
- 6) Electronic reprints in the form of a PDF are available by request at no additional charge.

*Effective date:* The policies and instructions to authors prescribed herein are effective for manuscripts accepted or submitted after September 14, 2018.

## INSTRUCTIONS TO AUTHORS

### Submission

*Electronic submission:* The *Journal of Parasitology* accepts papers submitted online using the PeerTrack system provided by Allen Press (<https://www.editorialmanager.com/jparasitology/>). The only software required is Adobe Acrobat Reader (available free from [www.adobe.com](http://www.adobe.com)). First-time users of the system are required to register for an account and will be assigned an account login and password. The account login and password are required for subsequent use of the system. The system allows authors to check the status of their manuscript and to add updated files. Access to manuscripts submitted electronically is strictly controlled by login and user privileges, thus assuring data security and confidentiality. After successful submission to PeerTrack, the manuscript will be assigned a tracking number and an Associate Editor who will handle the review process.

*Manuscript files:* Submit manuscript text files as Microsoft Word files (DOC, DOCX). **Do not submit your manuscript text as a PDF file.** Figure legends must be submitted in the manuscript text file and not as part of the figures themselves. See instructions below for format and style of manuscripts.

*Figures:* Figures are not embedded in the manuscript, but are submitted as individual files uploaded into PeerTrack. Submit figure files as Adobe Photoshop (PSD) or Illustrator (AI) files, TIF, JPG (quality level >9), PDF, or EPS files. Please preserve

your layers in figure files if possible. You may submit figures as Excel (XLS, XLSX) or Powerpoint (PPT, PPTX) files, but application versions and operating systems may introduce errors or result in an unsuitable figure. See instructions below for format and style of figures.

**Tables:** Tables are not embedded in the manuscript, but are submitted as individual files uploaded into PeerTrack. Submit table files as Microsoft Word files (DOC, DOCX) or Microsoft Excel files (XLS, XLSX). See instructions below for format and style of tables.

### Review and consideration process

- 1) Articles reporting original research, reviews, and short communications are evaluated by at least 2 anonymous reviewers selected by an Associate Editor (single-blind review). Critical comments are reviewed and published on the judgment of the Editor. The final decision of whether to publish is made by the Editor after reviews and opinions of the editorial board are considered.
- 2) Members of the editorial board submitting to the *Journal* are blinded to the peer review process to maintain reviewer anonymity; similarly, Editors submitting to the *Journal* are blinded to the peer review process and their submissions are handled solely by an Associate Editor through peer review, revision, and final disposition.

### Revision

Turn on TRACK CHANGES when revising your manuscript and submit the revised manuscript file with tracked changes through PeerTrack. When manuscripts are returned for revision, a cover letter from the Editor provides directions that must be followed. All suggestions of the reviewers and the Associate Editor and Editor must be addressed individually: a point-by-point statement of what has been revised or a brief rebuttal of those criticisms not addressed should be provided with the revision as a *Response to Reviewers*.

If figures do not need to be changed, do not replace the original files in PeerTrack.

### Correcting proof

Authors are responsible for the accuracy of their proofs and, therefore, what ultimately is printed in the *Journal*. **Corrected proofs must be returned to the Editor promptly**, ideally on the same day as received. Proofs are sent by e-mail and corrections can be sent by e-mail to [journalofparasitology@gmail.com](mailto:journalofparasitology@gmail.com). Please include the word "PROOF" and your manuscript number in the subject line.

In order to comply with the requirements of the International Code of Zoological Nomenclature (ICZN), all articles published in the *Journal* are immutable; this means that no changes will be allowed to any article after its initial public release in print or electronic form. It is the responsibility of the authors to carefully check their proofs for accuracy and to notify the Editor of any necessary changes before the article is released.

**Proofs corrections:** Indicate responsibility for printer's errors or alterations using abbreviation "PE." Unmarked alterations are assumed to be author's alterations. Unless they request additional text, queries on the proof are to be answered "yes" or "no"; and if there is no change to be made you should write "OK as set."

Correction of errors made by the author incurs charges as follows. Authors are allowed up to 5 proof alterations of text free of charge: each subsequent alteration costs \$5.00. Authors are reminded that added or removed characters may necessitate other corrections. Figure replacements and changes to tables are billed at the printer's current rate.

### Reprints

Electronic reprints in the form of a PDF are available by request at no additional charge.

### Return of materials

Papers not conforming to the *Journal* standards and formatting guidelines will be returned to the author for modification prior to the review process.

### Deposition of genetic data and voucher specimens

Scientific studies are both repeatable and verifiable. Genetic data (e.g., primary nucleotide and amino acid sequence data) must be available for verification and reanalysis and should be deposited in a public database such as GenBank or EMBL. Authors must declare and deposit new sequences and provide the data locator (e.g., GenBank/EMBL record accession number) in the text of their manuscript.

Physical voucher specimens serve as future references in verifying taxa and names in published studies. They are particularly important in field studies involving population sampling or specimen collection, especially when specimens are used to generate genetic data. The Editorial Board of the *Journal* recommends that voucher specimens be deposited in a permanent museum collection or other voucher repository to stabilize field studies and genetic data. The number of voucher specimens deposited should be sufficient to represent the author's opinion of the range of variation of a taxon but should not be so great as to unnecessarily strain museum space or resources. Whenever DNA samples or primary nucleotide and amino acid sequence data are deposited, a physical voucher specimen should be deposited to allow verification of their taxonomic identity.

## MANUSCRIPT PREPARATION

### General points of style

- 1) Use the same font and type size (12 pt) throughout the manuscript text; other font sizes may be appropriate for figures and tables (see below).
- 2) Choose a type font that distinguishes between "1" (one) and "l" (lowercase letter L). (12 pt Times New Roman preferred.)
- 3) Do not use proportional spacing or justified right margin.
- 4) Number all lines consecutively.
- 5) Number all pages consecutively.
- 6) Double space throughout. Do not add extra space between sentences. Eliminate extra spaces between words.
- 7) Write out numbers beginning a sentence, otherwise use Arabic numerals throughout, except in common phrases (e.g., "one of us" and "one or the other," but "1,000 microbes on the head of 1 pin"). Naked decimals are not permitted in the text, tables, legends, or on figures (i.e., "0.1,"

- not “.1”). Numbers greater than 999 must have commas (except in Literature Cited). Metric units are to be used in all articles. The 24-hour system is used to indicate time (e.g., 1500 hr).
- 8) Provide geographical coordinates of collection sites/ localities (e.g., 41°45'57.34"N, 71°18'52.20"W).
  - 9) Degree symbols are not used with temperatures. They are only used with latitude/longitude and angles.
  - 10) Spell out state, province, county and other political or geographical divisions unless they are used in a table or figure with a key to the abbreviation(s).
  - 11) Country names should be spelled in English (e.g., “Ivory Coast” not “Côte d’Ivoire”). Names of localities, states, provinces etc. may be anglicized or written in the local language (e.g., “Lake Baikal” or “Ozero Baykal”).
  - 12) Unless stated otherwise, U.S.A. is understood for locations, including addresses of authors, and is not stated.
  - 13) Words and abbreviations in Latin and other non-English languages, except for genus and species names, are not italicized. American spelling supersedes British, Australian, Indian, or other spelling.
  - 14) No and none are singular (e.g., “no worm was found”).
  - 15) Animal sacrifice is outside the scope of the *Journal*.
  - 16) Abbreviations such as mo, yr, wk are used when a number is present. Otherwise they are spelled out in full (e.g., “10-yr-old,” “6 wk” but “odd years,” “once each week”).
  - 17) Names of months are written out in the text, but may be abbreviated in tables and figures. When abbreviating months, use the first 3 letters of the month but omit a trailing period. Be consistent (i.e., in a table or figure, abbreviate no month or abbreviate all months).

### Heading and subdivision formats

There are 3 general levels of heading format available.

- 1) First-level headings are bold, flush with the left margin, and in all capital letters. The heading is unnumbered and ends without punctuation. First level headings are applied only to primary manuscript sections (e.g., “**MATERIALS AND METHODS,**” “**RESULTS,**” “**DISCUSSION**”).
- 2) Second-level headings are bold, flush with the left margin, and begin with a capital letter. Capitals are used in the remainder of the heading only for proper nouns. Second-level headings are used as required to subdivide primary sections of the manuscript. These headings are unnumbered and end without punctuation.
- 3) Third-level headings are indented for a paragraph, italicized, and end with a colon, also italicized. The initial letter of the first word is the only capital letter, except capitals needed for proper nouns. Text runs in immediately following this heading.
- 4) “Taxon-level” headings are reserved for taxonomic papers. They are bold, centered, and begin with a capital letter. Capitals are used in the remainder of the heading only for proper nouns.

### Use of taxonomic names and authorities

- 1) Scientific binomens must be included for all hosts and parasites mentioned. Where possible, provide the common

name of each host species on first mention. Generic and species names are italicized and specific epithets never appear without a generic designator.

- 2) The full binomen is written out at the first use of a species name in the abstract, text, figure legends and tables, even if it is part of a series of species in the same genus. Thereafter, the genus is abbreviated by use of the first letter, except at the beginning of a sentence where it is written out; and, in any situation where abbreviations would cause confusion 2-letter abbreviations may be used (e.g., “*Schistosoma mansoni* and *Schistosoma japonicum*” on first usage; subsequently, “*S. mansoni* and *S. japonicum*” but “*Aedes aegypti* and *Anopheles gambiae*” on first usage; subsequently “*Ae. aegypti* and *An. gambiae*”).
- 3) Author and date citations for scientific names need not be used in non-systematic papers. In systematic papers, author and date citations are used the first time a species, genus, or family is mentioned in the abstract and the text, but not subsequently except as described for tables and figures. Use must be according to the ICZN (or the relevant taxonomic code if the organism is a plant, bacteria, or virus) and should be consistent for all parasite and host species mentioned. Be consistent in citation pattern (i.e., include taxonomic authors or authors and dates for no taxon, or for all taxa, or for all parasitic taxa but no host taxon, etc.).
- 4) Author and date citations used only as authorities for scientific names appear in the Literature cited section at the author’s discretion. Be consistent: include no authority citation in the Literature cited section or include all authority citations in the Literature cited section.
- 5) Use the species name to refer to the taxon; avoid using it to refer to individuals of a species or genus.
- 6) Authors are reminded that names of taxa are not names of organisms. For example, *Fasciola* is the name of a genus (a group of related species) and as such it does not lay eggs, ingest cells, possess a sucker, etc. These are properties of organisms. Genus and species names should not be used as adjectives (e.g., not “*Schistosoma cercariae*” but “schistosome cercariae”) or as plurals (e.g., not “some *Gregarina niphandrodes*” but “specimens of *Gregarina niphandrodes*”). “Specimens” or “individuals” are plural and can take action: a genus or species cannot take action and is never plural.
- 7) The abbreviations n. fam., n. gen., n. sp., and n. nom. indicate the intent to commit a taxonomic act. They should be used on the first occurrence of a taxonomic name in the abstract, article text, a figure legend, or a table, but should not be used subsequently in the same manuscript section.

### Ecological terms

The terms prevalence, incidence, intensity, mean intensity, density, relative density, abundance, infrapopulation, suprapopulation, site, niche, and habitat are to be used as recommended by the ASP Ad Hoc Committee on the Use of Ecological Terms in Parasitology (1982, *Journal of Parasitology* 68: 131–133); also see Bush et al. (1997, *Journal of Parasitology* 83: 575–583) for an expanded and updated treatment of ecological terminology.

## Mathematical, chemical, biochemical, and genetic notations

- 1) Manuscripts submitted to the *Journal of Parasitology* should conform to the same conventions as those used for chemical and biochemical/molecular nomenclature.
- 2) Use a space between “±” or operators and number (“35 ± 2,” “2 + 2 = 4”), but no space between % and numbers (“25%”).
- 3) Use a space between measurements and number (“25 mm”).
- 4) Authors should write mathematical equations so that they can be set in 1 line of type. When 1 unit appears in a denominator, use the solidus (e.g., g/m<sup>2</sup>); for 2 or more units in a denominator, use negative exponents (e.g., g·m<sup>-2</sup>·day<sup>-1</sup>).
- 5) All chemical structures not accommodated by a single line of type must be drafted and reproduced as figures.
- 6) Abbreviations or symbols denoting nucleic acid products or sequences (i.e., genes, alleles, mRNAs) are italicized; abbreviations or symbols denoting amino acid products or sequences (proteins) are roman type.
- 7) Commonly used gene targets are abbreviated as follows:
  - a) Components of the ribosomal gene complex (rDNA): *18S*, *ITS1 5.8S*, *ITS2*, or *28S rRNA*; and,
  - b) Mitochondrially encoded cytochrome c oxidase 1 or 2: *COI*, *COII*.
  - c) Mitochondrially encoded NADH dehydrogenase 1: *ND1*.
  - d) All other genes are references in accordance with the guidelines for Human Gene Nomenclature HUGO Gene Nomenclature Committee ([www.genenames.org/about/guidelines](http://www.genenames.org/about/guidelines)).

## Acronyms and abbreviations

At first use, acronyms are placed in parentheses following the name written out in full. At subsequent use, the acronym alone is used. An acronym may begin a sentence but sentences may not begin with an abbreviation. Abbreviations are as recommended in the Council of Science Editors (CSE) style manual. The *Journal* uses all International System of Measurement (SI) metric unit abbreviations. Common CSE and SI abbreviations include the following (the same abbreviation is used for plural form):

wk (week)  
 hr (hour; use 0–2400 hr for time)  
 sec (second) min (minute)  
 mo (month)  
 day (not abbreviated)  
 n. sp. (new species)  
 n. gen. (new genus)  
 L (liter; but ml for milliliter)  
 RH (relative humidity)  
 p.o. (per os)  
 s.c. (subcutaneous)  
 i.pl. (intrapleural)  
 i.p. (intraperitoneal)  
 PI (post-inoculation, or post-infection)  
 p. (page)  
 ad lib. (ad libitum)  
 U.S.A. (as a noun)  
 U.S. (as an adjective)  
 sp. gr. (specific gravity)  
*t*-test  
*U*-test

*P* (probability)  
 $\bar{x}$  (arithmetic mean)  
*r* (correlation coefficient)  
*n* (sample size)  
 SD (standard deviation of the mean)  
 SE (standard error of the mean)  
 df (degrees of freedom) NS (not significant)

## Supplemental materials

You can refer to supplemental material in your article but please understand that the supplemental material is not printed with your article. It will be posted online and linked to your article on the journal website. When including supplemental material you should label the supplemental files separately in PeerTrack. Please also note that your Figure legend should be with the Figure, and the Table heading and footnotes should be with the Table. Supplemental material is made available exactly the way you submit it. Allen Press does not alter/edit this information they simply provide a link in the online version of the manuscript.

## Regular articles

The following instructions for regular articles serve as a general model for submissions to the *Journal*. Additional instructions for taxonomic papers, reviews, short communications, critical comments, and book reviews follow these general instructions for regular articles.

Manuscripts are organized in the following format and sequence, beginning with the running head, with all lines and pages numbered consecutively.

**Running head:** Provide the last names of authors (use “et al.” for more than 2) followed by a dash and shortened title, all caps, not bold, and 12 pt font size. The entire running head may not exceed 60 characters and spaces.

**Title:** On a new line immediately after the running head give the title of the article in all caps, bold type, and 12 pt font size. Titles should be short and descriptive. In the title only, numbers less than 11 are spelled out; numbers indicating papers in a series will not be accepted. Do not use author and date citations with scientific names in the title.

**Author block:** On a new line immediately after the title of the article give the names of authors in title case, bold type, and 12 pt font size. All other information in the author block is in roman type and title case but not bold font. On the next line, give the address of the first author. Present addresses and addresses for remaining authors, if different from that of the first author, follow sequentially, each beginning on a new line. Author and address associations are made using superscripted numerals that follow each author and precede each address. Please note that while author names are in bold font, numerals denoting associations are not. The last line of the author block begins “Correspondence should be sent to” followed by the corresponding author’s name in roman type and the e-mail address of the corresponding author in italics. Refer to a recent issue of the *Journal* for examples.

**Abstract:** The abstract must not exceed 400 words. The abstract is factual (as opposed to indicative) and outlines the objective, methods used, conclusions, and significance of the study. Be

concise; include brief statements about the intent, methods, results, and significance of findings, and new taxa. Indicate systematic or nomenclatural acts but do not give diagnoses of new taxa in the abstract. The abstract is headed with the word "Abstract" (cap/lowercase) ending with a colon. Text is run in after the colon, is not subdivided into paragraphs, and does not contain literature citations.

**Keywords:** Following the abstract on a new line, begin with the phrase "Key Words" in small caps followed by a colon and a list of key words in roman type, sentence case. Provide key words (up to 10 or 12) for indexing and abstracting purposes. Include parasite and host names (both common and scientific names); major higher taxonomic group names (family, order, class, etc.); geographic localities or habitat names; interdisciplinary focus, major methods used, etc.

**Introduction:** The introduction follows the keywords **immediately on the next line** and is un-headed. The introduction establishes the context of the paper by stating the general field of interest, presenting findings of others that will be challenged or developed, and specifying the specific question or hypothesis to be addressed. Accounts of previous work should be limited to the minimum information necessary to give appropriate context. Do not use extra spacing between paragraphs in the Introduction, or throughout the remaining text.

**Materials and methods:** This section provides information sufficient to permit repetition of the study by others. Methods and apparatus used should be indicated, but specific brand names and models need to be mentioned only if significant. The source (e.g., city and state, if in the U.S.A.), spelled in full, of special equipment or chemicals should also be given. If the source is outside of the U.S.A., then the city and country should be given. Previously published or standard techniques are to be referenced, but not detailed. Generic descriptions should be given for unusual compounds.

The primary heading for this section uses first-level format. Second- and third-level headings can be used to subdivide this section. If the materials and methods section is short, it should not be subdivided.

**Results:** This section is a concise account of new information. Tables and figures are used as appropriate, but should not repeat information in the text. Avoid detailing methods and interpreting results in this section. The primary heading for this section uses first-level format. The results section can be subdivided and headed to follow the materials and methods section.

**Discussion:** This section provides an interpretation and explanation of the results in the context of existing knowledge. Emphasis is placed on important new findings and new hypotheses are identified clearly. Conclusions must be supported by fact and data. The primary heading for this section uses first-level format. The discussion section can be subdivided and headed as for the materials and methods section.

**Acknowledgments:** These should be concise. Ethics require that colleagues be consulted before being acknowledged for their assistance in the study. Authors should acknowledge funding sources and support; applicable collecting, import, or export permits; and, ethical approvals in this section. The primary heading for this section uses first-level format. Subdivisions are not used in this section.

**Literature cited:** The primary heading for this section uses first-level format. Citations are arranged alphabetically by

surname. All references cited in the text must appear in the Literature cited section, and all items in this section must be cited in the text. Citation of unpublished studies or reports is not permitted. Abstracts not subjected to peer review may not be cited in the text or in the Literature cited section. Work may be cited as "in press" only when the paper has been accepted for publication. If absolutely necessary, a statement may be documented in the text of the paper by "pers. comm." The citation is indicated in the style: (X. Y. Smith, pers. comm.). Personal communications do not appear in the Literature Cited section. If there are more than 10 authors, then include names of the first 10, followed by "et al." Note that abbreviations are not used for titles or serial publications and spaces appear between initials.

*Style in the text:*

Allen (1989) (Allen, 1989)  
 (Allen and Smith, 1989) (Allen et al., 1989)  
 (Jones, 1987; Allen, 1989)—chronological  
 (Jones, 1987; Allen, 1989; Smith, 1989)—chronological and alphabetical within year  
 (Jones, 1987, 1988a, 1988b, 1989, 2015; Allen, 1989, 2014; Smith, 1989)

*Single or multiple authors with the same year of publication:* Use letter designators to differentiate references as follows:

- 1) For 2-author references, include the names of both authors and use letter designators to differentiate multiple references from the same author pair in the same year.
- 2) For references with more than 2 authors, use the first author's name and letter designators to differentiate references (e.g., "Smith et al., 2015a" and "Smith et al., 2015b" instead of "Smith, Jones, Boyd et al., 2015" and "Smith, Jones, Scott et al., 2015").
- 3) Assignment of letter designators to references is set by their order of appearance in the Literature cited section.

*Style in the Literature cited section:*

*Journal article, 1 author:*

Nollen, P. M. 1990. Chemosensitivity of *Philophthalmus megalurus* (Trematoda) miracidia. *Journal of Parasitology* 76: 439–440.

*Journal article, 2 authors:*

Edwards, D. D., and A. O. Bush. 1989. Helminth communities in avocets: Importance of the compound community. *Journal of Parasitology* 75: 225–238.

*Electronic journal article:*

Song, I., and A. Semyanov. 2011. Tonic excitation is set by GABA conductance in hippocampal interneurons. *Nature Communications* 2: 376. doi: 10.138/ncomms1377.

*Book:*

Schmidt, G. D., and L. S. Roberts. 1989. *Foundations of Parasitology*, 4th ed. Times Mirror/Mosby College Publishing Company, St. Louis, Missouri, 750 p.

*Chapter in edited book:*

Nesheim, M. C. 1989. Ascariasis and human nutrition. In *Ascariasis and its Prevention and Control*, D. W. T. Crompton, M. C. Nesbemi, and Z. S. Pawlowski (eds.). Taylor and Francis, London, U.K., p. 87–100.

*Thesis or dissertation:*

Monks, W. S. 1987. Relationship between the density of *Moniliformis moniliformis* and distribution within the definitive host population. M.S. Thesis. University of Nebraska-Lincoln, Lincoln, Nebraska, 64 p.

*Published conference proceedings:*

Herman, C. H. 1964. Disease as a factor in bird control. In Proceedings of 2nd bird control seminar. Bowling Green State University, Bowling Green, Ohio, p. 112–121.

*URL:*

Format as follows: Author. Date. Title of article, page, database, etc. Available at: www.here.org. Accessed XX Month XXXX. Caira, J. N., and C. Healy. 2006. Order Tetraphyllidea Carus, 1863. In The Global Cestode Database. J. N. Caira, K. Jensen, and C. J. Healy (eds.). Available at: www.cestodedatabase.org. Accessed 16 January 2006.

*Software:*

Swofford, D. L. 1993. PAUP Phylogenetic analysis using parsimony, version 3.1.1. Software distributed by Illinois Natural History Survey, Champaign, Illinois.

*Figure captions:* All figure captions appear consecutively after the Literature cited section. Do not place figure captions on the same page as the figures.

- 1) Each figure or plate of figures must have a caption. The caption is written in paragraph style, beginning with the word “Figure.” Captions are typed in roman, except when italic type is required (e.g., genus and species names).
- 2) Use bold for the leading element and individual figure references (see examples below).
- 3) For plates, a summary statement should precede the specific explanation of each figure. Avoid repeating information for each figure that can be placed in the summary statement.
- 4) Genus and species names are spelled out in full the first time used in each caption.
- 5) The caption must contain an explanation of all abbreviations used on the figures and indicate the metric value of scale bars used to show size unless the scale bars are labelled directly. Size cannot be indicated by magnification.
- 6) Abbreviations are arranged alphabetically following the final element as shown in the example below.
- 7) When a figure is published in color online and grayscale in print, authors must provide a single figure legend that adequately explains both the color and grayscale versions of the figure.
- 8) Examples:

**Figure 1.** Random amplified polymorphic DNA fingerprints for 11 individuals of *Ascaris suum*.

**Figures 2–4.** *Baracktrema obamai* n. gen., n. sp. from the black marsh turtle. . . (2) Anterior body segment. . . (3) Body segment III. . . (4) Body segment IV. . . Abbreviations: common genital pore, cgp; ovary, ov; testes, t. . .

*Tables:* Tables are used only to present data that cannot be incorporated conveniently into the text. Tables should be designed and constructed so that their data are readily compared across rows and columns to reveal trends or relationships in the data that are not readily apparent in a figure.

- 1) Tables must be designed to fit 1-column or 2-column widths (88 mm and 182 mm, respectively). Wider tables can be

reproduced in landscape orientation. Tables may flow to multiple manuscript pages to accommodate length, but do not reduce line-spacing or font size to accommodate additional material.

- 2) All columns in a table must have headings, with the first letter of the first word and proper nouns capitalized, (e.g., “Number sampled,” “% Recaptured,” “Jun–Aug”).
- 3) Horizontal lines are reserved for the table header; vertical lines are not permitted. Footnotes are used only for tables and appear directly under the table to which they pertain. Table footnotes symbols must be used in the following obligate sequence: \*, †, ‡, §, ||, #, ¶, \*\*, †† and should not be superscripted or subscripted. If other symbols are necessary, the table must be prepared as a line drawing and treated as a figure. Use of numbers as superscripts or subscripts is not permitted. Use of letters as superscripts or subscripts is restricted to indicating similarity or difference in statistical groupings.
- 4) Values from statistical tests are not published as tables; tests employed and probability accepted for significance can be stated in the materials and methods section with significant differences indicated in tables by footnotes, superscript letters, or in the text by a statement.
- 5) Names of months may be abbreviated in tables. When abbreviating months, use the first 3 letters of the month but omit a trailing period. Be consistent within tables (i.e., abbreviate no month or abbreviate all months).
- 6) Tables are numbered with Roman numerals in a continuous series and so referenced, in sequence, in the text. Captions are typed above the data on the same page. Species names are spelled out in full (and italicized) the first time used in each caption.
- 7) Tables are subject to intensive typesetting, thus a) precise alignment of columns in the manuscript is not required; and, b) authors should check their tables carefully for typesetting errors in proof.

## FIGURES AND PLATES

### General considerations

*Figure standards and publication:* Figure reproduction in the *Journal* is almost identical to what is submitted; thus, illustrations must be prepared to the professional standards outlined below. Figures are directly redacted for typesetting and publication, thus they should be prepared at full publication size. Figures will be lightly redacted for style and sized to fit appropriately within the layout of the manuscript but flaws will not be corrected. Manuscripts containing figures that ignore the following specifications will be returned to the authors for appropriate revision prior to publication of the paper.

*Figure types:* Figures are individual graphs, line drawings, illustrations, or photographs; multiple figures may be combined into a single plate. Different figure types use different printing technologies and thus require different submission files.

- 1) Line Art includes charts, graphs, and line drawings often called “bitmap” images because they replicate ink-on-paper drawings and use only black and white pixels. Line art figures reproduce the finest lines and greatest details when printed

and are generally used for graphical presentation of data or taxonomic plates.

- 2) Photographs and Illustrations use a broad palette of gray (grayscale) or color values (CMYK, RGB) and are published as halftone (grayscale) or CMYK (color) screened images. Grayscale and color images reproduce continuous tone images, but with less resolution and detail than line art images.
- 3) Combination figures use a combination of grayscale or color and line art elements.
- 4) Figures and plates should be submitted as separate files, not as part of the text.

*Figure size and resolution:* “Figure size” refers to the measurement of a figure or plate on the printed page. Figures or plates must be designed to fit 1-column (88 mm) or 2-column (182 mm) widths, and must be no longer than 210 mm in height to leave sufficient room beneath for a figure legend (in case of very long figure legends, plate height should be reduced to allow for the legend).

“Figure resolution” refers to the number of pixels or dots per inch (dpi). Figures must be submitted at final figure size at an acceptable resolution to produce high-quality images. To ensure the highest-quality published image, provide figures at the following full production sizes and resolutions. Figures submitted at other sizes and resolutions will be redacted to fit.

- 1) Line Art: 88 or 182 mm wide @ 1200 dpi (4,157 or 8,598 pixels wide × 9,921 pixels maximum height).
- 2) Photographs and illustrations: 88 or 182 mm wide @ 300 dpi (1,039 or 2,150 pixels width × 2,481 pixels maximum height).
- 3) Combination figures: 88 or 182 mm wide @ 600 dpi (2,079 or 4,299 pixels wide × 4,961 pixels maximum height).

*Figure captions:* A figure caption provides an explanation of a figure including all abbreviations used on the figures and the significance of shading, color, line weight, or symbols. Some computer programs place this latter information as a “legend” on the figure itself, which is unacceptable. Remove all legends from figures and include that information in the figure caption. Figure captions for plates begin with a general summary statement followed by captions for individual figures and combined abbreviation and legend information for the entire plate. Figure captions should not be placed on the plate; they should be at the end of the manuscript file directly after the literature cited section. Refer to the “Figure captions” under “Regular Articles,” above, for specific instructions on figure captions.

### General points of figure style

#### *Figure numbering and labels:*

- 1) Number all figures consecutively with Arabic numerals in the order in which they are referred to in the text. If necessary, refer to parts of a figure using lowercase letters (e.g., 1a, 1b).
- 2) Figure labels and lettering should contrast with the background. Use black lettering against light backgrounds and white lettering against dark backgrounds. Combine and offset black and white lettering to form a contrasting “drop shadow” against mixed, high-contrast backgrounds. Do not use white circles to offset black lettering from a dark background.
- 3) Use only essential labeling and provide detailed information in the caption.

#### *Font face and size:*

- 1) Use a single sans-serif font face (Helvetica or Arial) for all lettering on all figures in a single manuscript.
- 2) At final print size, font height for figure numbers should be ca. 6 mm. Labels for structures and scale bars should be ca. 3 mm height. See “charts” below for specific details on font sizes and styles for charts.
- 3) Species and genus names, such as those on phylogenetic trees or in graphs must be italicized. Non-scientific names, for example, “sp.,” “ex,” locality, strain, GenBank accession number, or reference label, are not italicized.

#### *Preparation of plates:*

- 1) Multiple figures or photos comprising a plate must be combined and arranged to be read left to right, top to bottom. Arrange figures within a plate to minimize internal “white space.”
- 2) Plates composed of illustrations or photographs must be arranged to form a rectangle without hanging or jutting images.
- 3) Grave lines (white lines between abutting component figures) must separate individual illustrations or photographs in a plate; line weight is ca. 0.7 mm at final print size.

#### *Scale bars:*

- 1) Place scale bars and values directly on the figure rather than in the figure caption.
- 2) Orient scale bar labels parallel (above or below, be consistent within manuscript) or perpendicular (to the left or right, be consistent within manuscript) to their scale bars. When possible, orient scale bars parallel or perpendicular to the plate edge and at the lower right-hand edge of each figure.
- 3) Separate figures in a plate may not share a single scale bar, except in the special circumstance in which **all** figures in the plate are illustrated at the same scale.
- 4) At final print size, scale bars are ca. 0.5–0.7 mm thick and at least 10 mm long but no longer than one-half the width of the figure being scaled.

#### *Line art:*

- 1) Several related line drawings or charts may be combined into 1 plate. Place scale bars and figure numbers internally relative to the plate rather than marginally to increase the size of individual figures and reduce white space.
- 2) Bars, wedges, and data objects in line art are separated using the following obligate fill sequence: open (0% fill), closed (100% fill), left hatch, right hatch, crosshatch, 20% fill, and 60% fill. Please do not depend on color alone to communicate graphic information.
- 3) If various degrees of fill are used, use 0%, 20%, 60%, and 100% fill to ensure sufficient visual separation.

#### *Charts:*

- 1) Charts must be understandable without reference to the text. Each axis should be labeled directly on the figure rather than in the figure legend.
- 2) Charts should include abscissa and ordinate axis labels and titles.

- 3) Axis titles read as the scale of the accompanying axis increases (i.e., abscissa title read right to left, ordinate title read bottom to top).
- 4) Axis tick marks should be used sparingly.
- 5) Do not include orientation lines in the field of the chart itself.
- 6) Do not use a 3-dimensional marker unless a z-axis is present and labeled (i.e., do not use 3-dimensional effects in a 2-dimensional chart).
- 7) Most charts that are square in outline can be designed for 1-column reproduction. Multiple related or comparison charts are individually numbered and arranged to form a single plate.
- 8) Do not enclose charts in a box outline.
- 9) Font size and line width varies depending upon the nature and size of the chart, but the following suggestions are satisfactory for most charts at 1,200 dpi:
  - i) Use the following sequence of data markers: open and closed circle, open and closed square, open and closed triangle, open and closed diamond, open and closed inverted triangle.
  - ii) Differentiate data series in bar charts using the following fills: open (0% fill), closed (100% fill), left hatch, right hatch, crosshatch, 20% fill, and 60% fill.
  - iii) Trend or “fever” lines should be ca. twice the width or weight of axis lines.
  - iv) Minimum font height for axis titles is 3.17 mm (9 pt); axis labels, 2.5 mm (7 pt).

#### Maps:

- 1) Component figures must be combined into 1 plate.
- 2) Proper attribution must be given to the source of map data. Permission requirements can generally be found on the website of the map source, and attribution information generally appears on the bottom corner of the map. (e.g., see [www.google.com/intl/ALL/permissions/geoguidelines.html](http://www.google.com/intl/ALL/permissions/geoguidelines.html) for attribution guidelines for Google Maps). Provide the attribution information in the figure caption if it is not clearly visible on the map.
- 3) Color-based computer maps do not always reproduce well. Please use clear, bold patterns, symbols, line weights, and fills to communicate information rather than or in addition to color.
- 4) Include a map scale and clearly label significant features to ensure proper identification of study locations.
- 5) Do not enclose maps in a box outline.

#### Photographs and illustrations:

- 1) Component figures must be combined into one plate.
- 2) Photographs should be continuous tone, of high quality, and with strong contrast.
- 3) Electron micrographs or photomicrographs must include a scale bar directly on the illustration. Please do not use magnification.

### Special instructions for taxonomic descriptions and systematic articles

A taxonomic paper should follow the general instructions given for a regular article, but the Results section is replaced by a section headed “Description” (or “Redescription” as appropriate), for-

matted as a first-level heading. Taxonomic descriptions include 5 subsections: the taxon name, synonymy, figure callout, diagnosis, description, taxonomic summary, and remarks. Taxonomic descriptions should conform to the following format and order:

The taxon name appears on a new line and is formatted as a taxon-level heading. The intention to establish new nominal taxa must be explicitly indicated by using appropriate abbreviations of anglicized terms for “new family” (“n. fam.”), “new genus” (“n. gen.”), or new species (“n. sp.”), following the taxon name on the same line. The abbreviation “nom. nov.” (“nomen novum”) is used only to indicate a new replacement name.

Synonyms and reference to figures follow, each appearing parenthetically on a separate line formatted as a taxon-level heading but in roman rather than bold font.

The Diagnosis and Description sections follow and are written using a telegraphic style (i.e., do not employ prepositions, start sentences with the subject, and refrain from using verbs except as absolutely necessary). Each section begins under a new heading (“Diagnosis” or “Description”) formatted as a second-level leading. The Diagnosis should not be subdivided but the Description section may be logically subdivided using third-level heading as needed.

The Description is followed by a “Taxonomic summary,” formatted as a second-level leading. The Taxonomic summary section comprises a listing of the type host, site, locality, specimens deposited, etc., each topic beginning a new paragraph. Each topic is self-referentially headed as a third-level heading but not indented. A partial list of common topics follows.

*Hosts:* Use full species binomen. Taxonomic authorities and dates are not required unless authors wish to express explicit intentions regarding host taxonomy.

*Locality/collection date:* Include geographical or political location and geographic coordinates (e.g., 95°5'11"N, 48°3'15"W). Collection dates and collectors may be included in this section.

*Site(s) of infection:* Please be as specific as possible.

*Prevalence and intensity:* Report mean, standard error or standard deviation, and range when known.

*Specimens deposited:* Museum accession numbers for appropriate type material (new taxa) and for voucher specimens (surveys) are required; the accession number of the museum must be preceded by the acronym of the appropriate museum. It is highly recommended that authors deposit 1, or more, type or voucher specimens in the U.S. National Parasite Collection, National Museum of Natural History, Smithsonian Institution, Washington, D.C. Appropriate photographic material should be deposited for descriptions of coccidia. Frozen tissues must also include accession numbers if deposited in a museum. In the case of phylogenetic studies involving, or based upon, sequence data, novel nucleotide, or protein sequence data must be deposited an appropriate public database (e.g., NCBI Nucleotide or Protein database), and accession numbers must be obtained and added to the manuscript no later than the proof stage.

*Records:* For redescriptions, list other geographic and host associations and cite previous reports.

*Specimens examined:* Identify by loaning museum and accession (catalog) numbers, other specimens examined.

*ZooBank registration:* The general form of this section is a list of taxonomic acts each followed by a Life Science Identifier (LSID) corresponding to a registration in ZooBank (e.g., “Anthocephaliidae

Ruhnke, Caira & Cox, 2015, n. fam., urn:lsid:zoobank.org:act:CE9134A1-52F3-4980-BDEE-B326CCFB87BD; *Anthocephalum jensenae* Ruhnke, Caira & Cox, 2015, n. sp., urn:lsid:zoobank.org:act:14A0537E-B932-421E-A928-4DA0848BA42D.”).

ZooBank is the Official Register of Zoological Nomenclature established by the International Commission on Zoological Nomenclature. The Editor will register your article in ZooBank on your behalf and insert a Life Science Identifier (LSID), into this section of your article. Your article will also include the online publication date, and the statement “Version of Record, first published online [online publication date] with fixed content and layout, in compliance with ICZN Arts. 8.1.3.2, 8.5, and 21.8.2 as amended, 2012.” After publication, the Editor will update your ZooBank entry with DOI and volume/issue information.

*Etymology:* Describe the origin and meaning of the proposed new name. Authors should expressly state the gender and derivation of a new genus-group name when establishing it.

The Remarks subsection follows at the discretion of the author, beginning with “Remarks” as a second-level heading. This section presents comparisons to all similar taxa to definitively distinguish new taxa from existing taxa. In single-description papers, such comparisons may be incorporated into the Discussion.

The final section of a taxonomic paper should be the Discussion, which may address phylogenetic position, molecular survey information, or ecological implications. The discussion should be a synthesis that places the new taxa in a phylogenetic and/or ecological context when possible.

### Short Communications

Short communications are organized as regular articles with the following exceptions:

- 1) “Short Communications” is the running head, i.e., “RH: SHORT COMMUNICATIONS.”
- 2) The title is in title case, bold type, 12 pt font size, and follows the running head on a new line.
- 3) The text of a short communication is written without sections and without extra spacing between paragraphs. Acknowledgments may be given, without heading, as the last paragraph.

### Review articles

Review articles are organized as regular articles with the following exceptions.

- 1) The title of a review begins “**REVIEW OF**” followed by the remaining title in bold type and capitalized.

- 2) Other section names may be used in place of the materials and methods, results, and discussion sections. Headings should be restricted to major headings and no more than 2 sublevels.
- 3) Use of tabular data or figures from the work of others must be consistent with copyright law, and it is the responsibility of the author to supply appropriate permissions when the manuscript is submitted.

### Critical comments

Critical comments are organized as regular articles with the following exceptions.

- 1) The title of a critical comment begins “**CRITICAL COMMENT:**” followed by the title of the article in bold type and capitalized.
- 2) The text is written without subdivision. Literature citations are made as for articles. Acknowledgments may be included as an un-headed final paragraph.

### Book reviews

Manuscripts are organized in the following format and 3-part sequence.

- 1) *Title:* Give the title of the book being reviewed, and other critical information, in the following style:

**Toxoplasmosis of Animals and Man**, by J. P. Dubey and C. P. Beattie. CRC Press, Boca Raton, Florida. 1988. 220 p. ISBN Number. Hardcover \$124.95.

The words “edited by” are substituted for “by” when appropriate. The book title, etc., should begin at the left-hand margin.

- 2) *Text:* Begin as a new paragraph immediately following the book title. The text usually is not subdivided. If literature must be cited, a headed Literature cited section follows the text in the style described for articles. Figures and tables should not be used.
- 3) *Name and address of author:* This information follows the text or, if present, the Literature cited section. The reviewer’s name should be in bold type; the address should follow, but not in bold type.

### Acknowledgments

These instructions are a revision of policies and practices formulated by previous editors. These instructions were markedly improved by the thoughtful comments and suggestions of the Editorial Assistant and Consulting and Associate Editors.