

AMERICAN JOURNAL *of* ENOLOGY AND VITICULTURE

2004 Revision

Guide to Authors

The *American Journal of Enology and Viticulture* (AJEV) publishes full-length research papers, literature reviews, technical briefs, and research notes on all subjects related to enology and viticulture.

Research papers are scientific communications that present a new principle, rigorously test an existing hypothesis, or otherwise provide important novel information to the scientific community. Descriptive studies that are hypothesis generating also fit into this category.

Literature reviews synthesize the hypotheses and results within the research area under review and critically compare the published literature.

Technical briefs provide important new information to technical members of the industry, but might not advance the forefront of science in viticulture or enology. Appropriate manuscripts may describe a new assay method, validate or improve upon an existing method, or provide a comparative analysis of the impact of use of different processing methods.

Research notes present data of value to the scientific community. One example would be an extensive compositional study or survey from a single region that would be valuable in a larger analysis of variation of composition in different wine-growing areas. Research notes are generally no longer than two to four pages. Important but negative results may also be presented in this format.

Sequential papers submitted together will most often be returned to the authors to be revised either as a single work or as separate papers, each of which can stand on its own.

The AJEV does not accept articles published in or submitted to other publications. Authorship of papers in the Journal is not limited to members of the American Society for Enology and Viticulture (ASEV); however, non-ASEV members are charged \$40.00 per final printed page.

Review Process

The science editor assigns each manuscript received to an associate editor. Manuscripts then undergo a two-step review process. Associate editors and the managing editor screen the manuscript to determine whether it meets standards of scientific rigor and language. (Manuscripts that are largely descriptive, confirmatory, or only of regional significance that otherwise do not present any new information or novel insights will not be accepted.) If a manuscript passes this initial screening review, it is sent to two peer reviewers. (Research notes may

receive one review.) Additional reviewers are consulted as necessary. Reviewers' comments and the associate editor's decision regarding acceptability of the manuscript will be forwarded to the corresponding author by the managing editor. This entire review process may take up to twelve weeks. Authors may be required to revise their manuscript before formal acceptance of the paper for publication.

Authors of submitted manuscripts may recommend three qualified reviewers who are not members of their institutions and who are not collaborators. Provide the name, institution, email and mailing addresses, fax and phone numbers, and area of expertise for each suggested reviewer. Such reviewers are contacted at the discretion of the associate editor.

The science editor, associate editors, and managing editor are responsible for judging the suitability of each manuscript for publication. The editors reserve the right to edit manuscripts to make them conform with the adopted style and/or to return them to the authors for revision.

Content of Manuscripts

All manuscripts submitted must be in English, following American-English standards of spelling and scientific notation (see the list of abbreviations at the end of this guide and consult *The ACS Style Guide: A Manual for Authors and Editors* [American Chemical Society, 1997] as a reference). Authors whose primary language is not English must have manuscripts proofread by an English-speaking expert before submittal. Prepare the content of manuscripts in the following order:

Title. The title must reflect the important aspects of the article as concisely as possible, in no more than 100 characters and spaces. Do not use both common and scientific names in the title. Titles may not be in the form of questions.

Authorship and byline. List the first and last names of all authors beneath the title. Authorship should be based only on substantial contributions to (1) the conception and design or analysis and interpretation of data and (2) the drafting of the paper or major revision for important intellectual content. The corresponding author must obtain final approval of the manuscript from all authors. All authors must have agreed to submission of the paper and take public responsibility for defending its content, including acknowledgments and citations, and have agreed that the corresponding author act on their behalf on all matters pertaining to publication.

List the following after the authors' names: authors' professional titles and current addresses, corresponding author's email and/or fax number, acknowledgments (see below), and manuscript submission date.

Acknowledgments. In a separate paragraph, note the source(s) of funds and materials used to conduct the research and where research was conducted, if applicable. Give personal acknowledgments of assistance in a second paragraph.

Abstract. For full research articles, include a one-paragraph abstract from 80 to no more than 250 words that clearly states the hypothesis, intent, or purpose of the research, the theoretical or experimental plan used, key findings (without experimental details or data), and major conclusions. Do not cite references, figures, or tables. Limit abstracts for research notes to no more than 100 words.

Key words. Include a list of four key words for indexing.

Introduction. Include a background review of the experimental design of your study and the measurement techniques employed, citing salient literature. Conclude with the hypothesis involved and/or the purpose of the investigation and how it will address deficiencies in existing knowledge.

Materials and methods. Enough detail must be given so that others may repeat your work. Identify the number of replications of experimental treatments and the number of times individual experiments were duplicated. For standard methods, cite the corresponding literature; describe in adequate detail those procedures that have not been fully described in cited publications. List model number and sources (vendor, city, state, country) of equipment and media used. When appropriate, include statistical analysis. Specify conditions or variables whose control influences the experimental results (use of colored lights or glasses in sensory evaluation, for example). See also the sections *Reporting Information* and *Reporting Sensory Evaluation* in the following pages.

Results. Report the results of your study here; reserve your interpretation of the results for the discussion section. Present results concisely in the text and any accompanying tables (and figures, if necessary). Avoid extensive use of graphs; tables are often more effective. In short papers, the Results and Discussion sections may be combined.

Discussion. The purpose of this section is to interpret the results in relation to previous literature, to propose explanations for the results observed, and to discuss possible applications. Avoid speculation unsupported by the data obtained.

Conclusion. This final section should draw conclusions concerning the original problem/hypothesis and the information given in the study. Base conclusions on the information given in the paper. Do not summarize the paper, repeat information given in the results and discussions sections, introduce new information, or cite additional sources.

Literature cited. AJEV uses the author and date, rather than the numbered, system, for citations; samples are given below. Authors are responsible for the accuracy of all citations, which will be copyedited for format only.

The Literature Cited section should contain only published, relevant sources that are accessible through an information system. These sources include journal articles, books (and chapters in books), proceedings, bulletins, reports, *published* abstracts of papers presented at meetings, patents, theses, dissertations, and in-press (accepted) articles. Published sources are preferred over on-line sources, which may become unavailable. Do not include the following in the Literature Cited section: unpublished abstracts, unpublished data, personal communications, manuscripts in preparation or submitted for publication, letters, company publications, databases, and software used for analysis; these should be referred to in parentheses in the text (see examples below). All sources in the Literature Cited section must be cited in the text.

Arrange citations alphabetically by author(s) (letter by letter) and chronologically when there are multiple citations for the same first author. List authors by senior author (last name first, then initials) followed by additional authors (initials first) (e.g., McKibben, J.M., J. Sams, and D. Howard.) and ending with a period. All authors of an article must be listed in the Literature Cited section. If a source has no author, list the sponsoring organization or publisher, such as "OIV" or "ASEV." Do not use "Anonymous."

The year of publication follows the author(s). Place a period after this date. If more than one work by the same author is cited, list the publications in chronological order; if the year is identical, insert lowercase letters (i.e., a, b, c) after the date according to the order each source is cited in the text. In the text of the paper, reference citations by author and date in parentheses.

The title follows the date. For journal article titles, lowercase all words except for the first word and proper nouns, and do not place quotation marks around the title. (For books, capitalize titles according to the published title.) Do not abbreviate any part of the title. Retain italicized words (e.g., *Vitis vinifera*). Journal name follows the title. Spell out all journals with one-word names (such as *Phytopathology*); abbreviate multiword journals using standard abbreviation. (Consult a previous issue of the AJEV.) Next give the volume, followed by a colon and the page numbers of the article. (Issue numbers are only necessary when each issue within a volume begins with page 1; include the issue number in parentheses after the volume number.) Give full pagination, with no spaces (e.g., 53:2096-2103). The correct order of elements in sources other than journals is noted in the examples.

Journal article (for online journals, place "[online]" after the journal title abbreviation):

Spayd, S.E., J.M. Tarara, D.L. Mee, and J.C. Ferguson. 2002. Separation of sunlight and temperature effects on the composition of *Vitis vinifera* cv. Merlot berries. *Am. J. Enol. Vitic.* 53:171-182.

In-text citation: (Spayd et al. 2002) [for three or more authors, use "et al." following the senior author's name in the text citation]

In-press article:

Frivik, S.K., and S.E. Ebeler. 2003, in press. Influence of sulfur dioxide on the formation of aldehydes in white wine. *Am. J. Enol. Vitic.* [include volume and page numbers, if known]

In-text citation: (Frivik and Ebeler 2003)

Book:

Boulton, R., V. Singleton, L. Bisson, and R. Kunkee. 1996. Principles and Practices of Winemaking. Chapman & Hall, New York.

In-text citation: (Boulton et al. 1996)

Chapter in book:

Sponholz, W.R. 1993. Wine spoilage by microorganisms. *In* Wine Microbiology and Biotechnology. G.H. Fleet (Ed.), pp. 395-420. Harwood Academic Publishers, Chur, Switzerland.

In-text citation: (Sponholz 1993)

Symposium/meeting proceedings:

Wample, R.L., and T.K. Wolf. 1996. Practical considerations that impact vine cold hardiness. *In* Proceedings for the Fourth International Symposium on Cool Climate Enology and Viticulture. T. Henick-Kling et al. (Eds.), pp. 23-38. N.Y. State Agricultural Experiment Station, Geneva, NY.

In-text citation: (Wample and Wolf 1996)

Symposium series:

Butzke, C.E., T.J. Evans, and S.E. Ebeler. 1998. Detection of cork taint in wine using automated solid-phase microextraction in combination with GC/MS-SIM. *In* Chemistry of Wine Flavor. A.L. Waterhouse and S.E. Ebeler (Eds.), pp. 208-216. ACS Symp. Ser. 714. American Chemical Society, Washington, DC.

In-text citation: (Butzke et al. 1998)

Thesis:

Wolpert, J.A. 1983. Cold acclimation of Concord grapevines. Thesis, Michigan State University.

In-text citation: (Wolpert 1983)

Patent:

Garner, I. December 2002. Process for unbalanced wine. U.S. patent 123,456,789.

In-text citation: (Garner 2002)

Abstract:

Turbow, S., and D. Block. 2002. Effects of viticultural practices on the aroma of 2000 Napa Valley Cabernet Sauvignon wines. *Abstr. ASEV 53rd Ann. Meet. Am. J. Enol. Vitic.* 53:249A.

In-text citation: (Turbow and Block 2002)

References listed in text. References to unpublished data, personal communication, articles submitted for publication, software, web sites, databases, company publications, and unpublished abstracts should be listed in the text in parentheses, as follow:

Unpublished data and communications: (Andrew Reynolds 2002, unpublished data); (Glen Creasy 2001, personal communication); (Barry Gump 2004, submitted for publication)

Software: “. . . data was analyzed with SAS statistical software (version 8.1; SAS Institute, Cary, NC).”

Web site: “. . . information found on the ASEV web site (<http://www.asev.org>).”

Database: “. . . vector sequences were removed by cross-match (<http://www.genome.washington.edu>).”

Company catalog: “. . . odors are described as bacon and smoky (Aldrich catalog, Sigma-Aldrich, Milwaukee, WI).”

Tables and Figures

Tables. Information presented in a table must be self-explanatory and agree with the text. The table caption should summarize the information in the table without repeating the col-

umn headings. Each column must have a heading that names the variable being measured and indicates the unit of measure within parentheses [e.g., (mg/L) (%)]. Keep column headings brief. (Follow the list of abbreviations at the end of this Guide to Authors.) Explain nonstandard abbreviations in footnotes. Designate footnotes with superscript lowercase letters beginning with ^a (a, b, c). Use the same style for all tables.

If only a few values are presented, then place the information in the text rather than in a table. Data presented in tables should not be repeated in figures.

Cite tables in numeric order in the manuscript. In electronic files: Place tables in the same rtf file as the manuscript and literature citations. Do not submit tables in Excel format; use the standard table format in your word-processing program.

Figures. Submitted figures must be high quality and ready to be published. AJEV does not create or revise figures. Place each figure on a separate page and label each one with the appropriate figure number. Cite all figures in numeric order in the manuscript. Legends (captions) should describe the contents so that each illustration is understandable when considered apart from the text. All symbols and abbreviations must conform to AJEV standards.

For callouts (labels) within figures: the typeface (or “font”) must be consistent for all figures and artwork within a paper. Use a sans serif typeface such as Helvetica or Arial; do not use bold type. Use upper- and lowercase lettering that is no less than 8 point type (“font size”) at final reduced size. Figures should be either single or double column (3½ or 7¼ inches in width, respectively).

For line graphs, frame graphs and affix index marks to the vertical axis (y axis, or ordinate) and to the horizontal axis (x axis, or abscissa). Symbols are used to indicate data points. Use open circles for the first set of data and filled circles for the second; triangles, open and filled, are next; then squares, open and filled (○●△▲□■). If a graph requires more than six symbols, consider presenting the data in two graphs. (Diamonds are the fourth set of symbols.) Keys to symbols should be set in a small, inset box in the line graph (or next to it); do not place them in the text of the legend/caption.

Special effects, such as 3-dimensional bar charts or graphs, are unacceptable as they are difficult to read. Report such information in a table, if necessary. Use solid shades of gray in bar charts (not patterns); differentiate among the gray levels by at least 20%. Include error bars, if appropriate. Line weight in figures should be no less than .30 points. For prominent lines, such as graph plot lines, the weight should be approximately 1 point.

Black and white illustrations are standard, but color may be considered by the managing editor. Color costs are paid by the author and run approximately \$900.00. A cost quotation may be provided, and the author or an institutional officer must indicate acceptance of responsibility for the quoted rate in writing before processing of that figure will be started.

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Photographs should be high-quality glossy prints cropped at right angles to show only essential details. Overlays may be used to indicate cropping. Insert a scale bar when necessary to indicate magnification.

To avoid damage in transit, do not paperclip figures together or to the manuscript. Place small figures in an envelope.

Submitting electronic figure files. We encourage authors to submit figures digitally. Provide figures on a PC-formatted disk. We accept the following media:

- 3.5-inch floppy disk
- Zip disk
- CD-ROM

Include high-quality printed copies that are identical to the artwork in the files. Discrepancies between printed copies and electronic files will delay publication.

Accepted file formats. The Journal supports the following applications and formats for Windows and will accept only TIFF or EPS files as listed.

For pictures/halftones:

- Adobe Photoshop, TIFF files
- CorelPhoto-Paint, TIFF files

For line art:

- Adobe Illustrator, EPS or TIFF files
- CorelDRAW, EPS or TIFF files

Do not send figures in PowerPoint.

Images should be saved and submitted in the size at which they will be printed. Crop, scale, rotate, and manipulate images during the scanning or imaging stage (i.e., in Adobe Photoshop) before submitting them to the Journal.

Assemble multipanel figures (figures with parts labeled A, B, C, D, etc.) into one piece and supply as one file.

Internet graphics downloaded or saved from web pages are not acceptable. These graphics have very low-resolution images (usually 72 dpi) that are intended for screen display, not for higher-resolution print.

Scanning figures. When scanning images and placing them in programs like Adobe Illustrator to be manipulated, it is important to use the correct resolution or dpi (dots per inch, also referred to as pixels per inch or ppi). Use the following guide to set the proper resolution for the type of image you are scanning.

- **Lineart** (graphs, charts, diagrams): scan at 900 to 1200 dpi and save in bitmap/monochrome mode.
- **Halftones** (black and white pictures): scan at 300 dpi and save in grayscale mode.
- **Combination halftones** (black and white pictures with text and/or graphics added): scan at 600 dpi and save in grayscale mode.

If you have questions about preparing files, please email the publications coordinator at judysams@asev.org.

Reporting Information

Trade names. The names of manufacturers or suppliers of special (not reagent grade) materials should be given (includ-

ing city, state, and country). Trade names must be capitalized and followed by ® or ™. In experimentation, a chemical compound should be identified by its common name (if such name exists) or by the chemical name and structural formula.

Nomenclature. The binomial or trinomial (in italics) must be shown for plant, insects, and pathogens when first used in the abstract and in the text (for example, *Vitis vinifera*). Following citation in Materials and Methods, the generic name may be abbreviated to the initial, except when confusion could arise by reference to other genera with the same initial. A collection number or that of a comparable listing should identify algae and microorganisms referred to in the manuscript.

For varietal names, the AJEV conforms to spellings listed in the BATF *Working List of US Wine Grape Varieties*.

Chemical identification. Papers reporting on flavor constituents should conform to the recommendations made by the International Organization of the Flavor Industry [see J. Agric. Food Chem. 44:10 (1996)]. Any flavoring substance must have its identity confirmed by at least two methods. Otherwise, the identification should be labeled “tentative.” Authors should include at least semiquantitative data on the concentration of an identified component in the original source. Ranges such as <1 µg/L, 1 to 10 µg/L, 10 to 100 µg/L, rather than absolute amounts, are acceptable.

Numerals. Spell out all numbers or fractions that begin a sentence. Do not use a dash or hyphen to replace the preposition “to” between numerals (13 to 22 min, 3 to 10°C) within the text; however, a dash or hyphen may be used in tables and figures.

Write out numerals one through nine, except with units of measure. Write out and hyphenate simple fractions (for example, two-thirds). It is best to use decimals instead of fractions.

Time and dates. When reporting time, use the 24-hour time system with four digits; the first two for hours and the last two for minutes (for example, 0400 hr for 4:00 a.m., 1630 hr for 4:30 p.m.). Dates are reported as day of month, month, and year (9 April 2002).

Units. Units of measure are treated as collective nouns and take singular verbs (for example, “2.5 mL of bentonite was added to the sample”). Also observe the following:

Wine volume: report as liter (L) or milliliter (mL). Hectoliters are not recommended. Abbreviate liter as a capital L, not lowercase, to avoid confusion with the number 1.

Grape weights: report as grams (g), kilograms (kg), and metric tons (t).

Temperature: report as degrees Celsius (°C) only.

Parts per million (ppm) and parts per billion (ppb) are not recommended. Use the equivalent milligrams per L (mg/L) and micrograms per liter (µg/L).

Wine or juice yield: report as liters per 1000 kg (L/1000 kg) or milliliters per kilogram (mL/kg) (equivalent).

Land area: report as hectares (Ha) (1 Ha = 2.47 acres).

Statistical methods. Authors must report enough details of their experimental design so that the results can be judged for

validity and so that previous experiments may serve as a basis for the design of future experiments.

Multiple comparison procedures such as Duncan's multiple range test are frequently misused. Such misuse may result in incorrect scientific conclusions. Multiple range tests should be used only when the treatment structure is not well understood (for example, studies to compare cultivars). When treatments have a logical structure, significant differences among treatments should be shown using *t* or *F* tests.

Field experiments, such as studies on crop yield and yield components, that are sensitive to environmental interactions and in which the crop environment is not rigidly controlled or monitored, should be repeated (over time and/or space) to demonstrate that similar results can (or cannot) be obtained in another environmental regime. Perform replicate chemical or sensory evaluations to show reproducibility and consistency, respectively.

Abbreviations and symbols. See the accompanying list of abbreviations. Replacement of certain unwieldy chemical names by well-known abbreviations is acceptable (for example, ATP, DNA). Standard chemical symbols may be used without definition (Ca, NaOH). If the paper uses numerous abbreviations, define all in a single paragraph after the key words; use such abbreviations only if a term is used at least five times.

With the exception of those standard for international usage (for example, HPLC, ATP), do not use abbreviations in the title or abstract. The metric system is standard, and SI units should be used (other units may be placed in parenthesis after the SI). Symbols and abbreviations in figures and tables must also conform to guidelines.

Reporting Sensory Evaluation

As with other disciplines, manuscripts reporting sensory information should present some new principle, rigorously test an existing hypothesis, or otherwise provide important new information to the scientific community. In all cases, authors must clearly indicate exactly how the test was conducted, at what temperature the wines were stored, for how long the wines were stored, at what temperature the wines were served to the panelists, what type of glassware was used, how much wine was poured in each glass, how many tests the panelists performed, and how many samples were served per session.

Panelists. Trained panelists or "expert" panelists may not be asked to indicate their liking or the acceptability of the sample(s). Only true consumer panelists can give this type of information. Consumer panelists usually should not be asked to score the intensities of specified sensory attributes. However, there may be isolated situations where this would be acceptable.

Discrimination testing. With discrimination testing (such as paired difference, duo-trio, triangle, two-out-of-five) the objective is to determine whether two samples are perceptibly different. In all cases, except the directional paired difference test, that is the only information the test provides.

The major issue with discrimination tests is ensuring that the test had enough power. (Power is defined as the probability of finding a difference that actually exists). Power is affected by

several factors, but the one that the experimenter usually has control over is the number of panelists evaluating the samples.

If a discrimination test shows that two samples are perceived to be significantly different, then the test had enough power (regardless of the number of panelists).

If a discrimination test shows that two samples are not perceived to be significantly different, then the power issue becomes crucially important and the authors must then indicate the power associated with their test. (This is usually the issue when authors want to show that a new method or variation does not affect the sensory properties of the product—the power of such tests is low when the number of panelists is small.¹)

Using the directional paired difference test with wines can be problematic. The requirement for this test is that the two samples may only differ in a single sensory attribute: for example, a 1% salt-water solution is less salty than a 2% salt-water solution, but it does not differ in any other sensory modality. However, when real products are used this is often not true; for example, a wine with 2% residual sugar is perceived to be less sweet than one with 4% residual sugar, but the first wine may also be perceived to be sourer than the second. In such cases, the paired directional test should not be used.

Description analysis. When authors use the descriptive analysis techniques to evaluate their samples, there are three major issues:

First, unless the panel was trained by or in direct consultation with the Tragon Corp. (Palo Alto, CA), the technique used was not QDA (Quantitative Descriptive Analysis). QDA is a registered trademark of Tragon. The same is true for the FPA (Flavor Profile Analysis), which is trademarked by A.D. Little Company (Boston, MA) and the SDA (Spectrum Descriptive Analysis) of Sensory Spectrum (East Hanover, NJ).

Second, usually authors use variations of the above techniques. They could refer to a variation of the QDA technique as the consensus training method and to variations of the FPA and SDA as ballot training methods. It is also possible to amalgamate the two methodologies as a combination training method.

Third, authors must give explicit information on the following: number of panelists; source of panelists; method of training; length of training; assessment of training; attributes used;

¹Example: Authors want to indicate that using a new fining agent produces a wine that is not perceptibly different from a wine fined with a more traditional agent.

Before starting the study, the authors determine that they want a power of 90% (a 90% chance of detecting a difference if it exists). This is analogous to a Type II error (beta) of 10%. In addition, the authors use the usual Type I error (alpha) of 5%; they want less than 10% of the population to discriminate between the samples. Given these assumptions, the authors determine that to perform a triangle test they would need at least 342 panelists. Using the same assumptions but a duo-trio test, authors would need 853 panelists.

After completing the study, the authors write a paper stating that they used alpha at 5%, a duo-trio test, and 50 panelists and found that the two fining agents did not significantly differ in how they affected the sensory quality of the wine. The reviewer determines that assuming that less than 25% of the population can detect a difference; the power of this test is about 55%. If the authors had performed a triangle test, then the power would have been 78%.

references standards/verbal descriptors used for attributes; number of times each panelist evaluated each sample; number of samples per session; number of sessions; duration of sessions; time between sessions.

Submission of Manuscripts

Mail three printed copies of your manuscript and a 3.5" high-density PC-formatted disk, CD, or zip disk to:

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Cover letter. Include a cover letter that contains the telephone and fax numbers and an email address of the corresponding author and that states the manuscript is not being submitted, in review, or otherwise considered for publication elsewhere.

Format of printed manuscripts. Organize printed manuscripts as stated above in the *Content of Manuscripts* section and as follows:

- Printed, double-spaced, on 8.5 x 11 inch (21.5 x 28 cm) paper (or on A4 paper with the margins set for US letter size paper).
- Number each page beginning with the title page, and number the lines on each page for ease of reference by reviewers.
- The text of the paper must be followed in order by literature cited, tables (one per page), figure legends/captions (grouped together), and figures (one per page). (See below for electronic format.)
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Format of electronic files. The electronic file must match the printed manuscript exactly. Use a PC-formatted, high-density disk, Zip disk, or CD. We cannot accept files on Mac-formatted disks.

- Include the text of the paper, literature citations, tables, and figure legends in one (1) rich text format (.rtf) file. (Make sure tables are included in this file; do not submit tables as Excel files.)
- Place each figure in a separate TIFF or EPS file. See the section on *Tables and Figures* for guidelines on formatting graphics files.
- Include all linked files.

- Do not use the "compare" or "insert" feature in your word-processing program to highlight changes in the original or revised file.
- Do not create symbols or equations as graphics. Use the "insert symbol" function in your word-processing program.
- Label the disk with the title of the paper and the name of the corresponding author.

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AJEV ABBREVIATIONS AND SYMBOLS

Term	Abbreviation or Symbol
absorbance (in tables and figures)	abs
acetoxyl	AcO
acetyl	Ac
active ingredient	a.i.
adenosine 5' diphosphate (adenosine diphosphate)	ADP
adenosine 5' monophosphate (adenosine monophosphate)	AMP
adenosine 5' triphosphate (adenosine triphosphate)	ATP
alternating current	AC
ampere	A
et alia (Latin: and others)	et al.
ante meridiem	AM
atmosphere (see also standard atmosphere)	Atm
average (abbreviate in tables and equations only)	avg
°Balling	Brix
boiling point	bp
British thermal unit	Btu
Brix (no degree sign)	Brix
capillary electrophoresis-mass spectrometry	CE-MS
°Celsius	°C
°centigrade	°C
chemically pure	CP
coefficient	coeff.
coenzyme A	CoA
colony forming unit(s)	cfu
concentrate	conc.
concentration (in tables and figures)	concn
constant	const.
cosecant	csc
cosine	cos
cotangent	cot
counts per second	counts/sec
cubic centimeter	cm ³
cultivar (only after specific epithet)	cv.

day, days	day
decibel	dB
degree (angular)	°
deoxyribonucleic acid	DNA
dextro (preceding chemical name)	(small cap) D
dextrorotatory (preceding chemical name)	(italic) <i>d</i> (+)
diameter	diam
direct current	DC
dissociation constant, negative logarithm of	pK
effective dose, 50%	ED ₅₀
electromotive force	emf
electron volt	eV
equation (reference in text)	(eq)
equivalent	equiv
exponential	exp
for example (in tables and figure captions only)	e.g.
freezing point	fp
frequency modulation	FM
gas chromatography	GC
gram	g
gravity (gravitation constant)	(italic) <i>g</i>
hectare	Ha
hertz	Hz
high-performance liquid chromatography	HPLC
hour	hr
hydrogen ion concentration, negative logarithm of	pH
inch	in
infrared	IR
inhibitor constant	K _i
inside diameter	i.d.
joule	J
kelvin	°K
kilo (x 10 ³)	k
kilodalton	kDa
kilogram	kg
kilometer	km
kilovolt	kV
kilowatt	kW
lethal dose, 50%	LD ₅₀
levo- (preceding chemical name)	(small cap) L
liter	L
logarithm (to base 10; common logarithm)	log
logarithm, natural	ln
lumen	lm
lux	lx
mass	(italic) <i>m</i>
mass-to-charge ratio	(italic) <i>m/z</i>
mass charge on electron	(italic) <i>m/e</i>
maximum	max.
mega (x 10 ⁶)	M
megapascal	MPa
melting point	mp
meta- (preceding chemical name)	(italic) <i>m</i>
meter	m
Michaelis constant	k _m
micro (x 10 ⁻⁶)	μ
microequivalent	μeq

microgram	µg	rate change of a process with 10° increase	Q ₁₀
microliter	µL	retardation factor (distance unknown factor has traveled relative to a solvent front in chromatography)	R ₁
micrometer (micron)	µm	revolutions per minute	rpm
micromole	µmol	ribonucleic acid	RNA
milli (x 10 ⁻³)	m	roentgen equivalent man	rem
milliampere	mA	second (angular)	"
milliequivalent	meq	second (time)	sec
milligram	mg	secondary (preceding chemical name; s subscript (e.g., BA _s))	(italic) <i>sec-</i>
milliliter	mL	significant at 0.05 level	*
millimeter	mm	significant at 0.01 level	**
millimole	mmol	significant at 0.001 level	***
millivolt	mV	sine	sin
minimum	min.	species (only after generic name)	sp., spp.
minute (angular)	'	specivies nova (only after specific epithet)	sp. nov.
minute (time)	min	specific gravity	sp gr
mitochondrial deoxyribonucleic acid	mtDNA	specific heat	sp ht
molar (concentration)	(italic) <i>M</i>	specific volume	sp vol
mole	mol	square	sq
month	mo	standard atmosphere	atm
nano (x 10 ⁻⁹)	n	standard deviation	SD
nanometer	nm	standard error	SE
Nephelos turbidity unit	NTU	standard temperature and pressure	STP
newton	N	substrate constant (see Michaelis)	(italic) <i>K_m</i>
nicotinamide adenine dinucleotide	NAD	surface tension	N/m
nicotinamide adenine dinucleotide, reduced	NADH	tangent	tan
nicotinamide adenine dinucleotide phosphate (reduced)	NADP	temperature	temp
normal (concentration)	<i>N</i>	tera (x 10 ¹²)	T
normal (preceding chemical name)	<i>n</i>	tertiary (preceding chemical name)	(italic) <i>tert-</i>
not significant	ns	that is (in tables and figure captions only)	i.e.
nuclear magnetic resonance	NMR	thin layer chromatography	TLC
number (in table headings)	no.	tonne (metric ton)	t
ohm	Ω	transfer ribonucleic acid	tRNA
ortho- (position; preceding chemical name)	(italic) <i>o</i>	ultrahigh frequency	UHF
ounce (avoirdupois)	oz	ultraviolet	UV
outside diameter	o.d.	varietas (variety; only after specific epithet)	var.
para- (preceding chemical name)	(italic) <i>p</i>	versus (only in tables and figures; spell out in text)	vs
parts per billion	µg/L	volt	V
parts per million	mg/L	volume	vol
pascal	Pa	volume ratio (volume per volume)	v/v
per	/	watt	W
percent	%	week	wk
peta (x 10 ¹⁵)	P	weight	wt
pico (x 10 ⁻¹²)	p	weight per volume	w/v
polymerase chain reaction	PCR	weight ratio (weight per weight)	w/w
post meridiem	PM	year	yr
pound (avoirdupois)	lb		
pounds per square inch	lb/in ²		
probability (lowercase italic)	<i>p</i>		
racemic (optical configuration, a mixture of dextro- and levo-) (preceding chemical name)	(small caps) DL		