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## INSTRUCTIONS FOR CONTRIBUTORS

*Russian Journal of Plant Physiology (Fiziologiya rastenii)* is a bimonthly journal published by the Russian Academy of Sciences (RAS) simultaneously in Russian and English. It was founded by the RAS and the Timiryazev Institute of Plant Physiology of the RAS (Moscow). The manuscripts which are sent for publication in the Journal should be submitted on the adequate English or Russian languages. An author's translation of the manuscript is permitted.

**Postal address** of The Editorial Office of *Russ. J. Plant Physiol.*: Timiryazev Institute of Plant Physiology, RAS, Botanicheskaya ul. 35, Moscow, 127276 Russia. Phone: 7 (499) 977-9300; fax: 7 (499) 977-8018; **e-mail address**: [fizrast@mail.ru](mailto:fizrast@mail.ru)

Tables of contents and other useful information, including these instructions for contributors, are available at the websites of the publisher – <http://www.maik.ru>, <http://pleiades.online>, and of the Journal – <http://www.rusplant.ru>

**1. The Journal Profile.** *Russian Journal of Plant Physiology* publishes the new results of completed original studies on any aspect of plant physiology based also on approaches and methods of biochemistry, biophysics, genetics, molecular biology, genetic engineering, applied plant physiology, and other related fields. Priority is given to original research that contains new ideas, clearly formulated hypotheses and answers to questions relevant to a wide range of readers. Papers covering special cases of the well-studied problems in the general case will not be considered and rejected before peer review. We also accept descriptions of original methods and instruments opening novel possibilities for obtaining and analyzing experimental results. Papers outlining trends and hypotheses are accepted as well. Review articles, chronicles of congresses and conferences, and book reviews are published at the invitation of Editor-in-Chief. For serial publication, not less than two manuscripts should be submitted simultaneously. Brief communications are not accepted. However, in some cases, the editors may suggest that authors shorten a manuscript to the size of a brief communication (no more than 10 pages of text and 4 figures and/or tables in all). Manuscript submission implies that the material has not been published before and is not under consideration for publication anywhere else.

### **2. General guidelines for the preparation of the manuscript.**

2.1. The manuscript should be prepared in accordance with a Standard Form. The Editorial Office will send the **Form (Style file)** and the **Copyright Transfer Agreement** by email at the request of the authors.

2.2. Manuscript length should not exceed 20 printed pages (30 printed pages for review) including references, tables, figure captions and illustrations; it should contain no more than 7 figures.

2.3. The manuscript must be typed (Times New Roman font, 12 pt, 1.5 spacing throughout) in a single column with left and top margins of 2.5 cm and a right margin of 1.5 cm.

2.4. There must be *one space* between each word in the text.

2.5. All pages including references, tables and figure captions should be numbered consecutively in the top right-hand corner. *Pages with figures are not numbered.*

2.6. All lines should be enumerated throughout the entire text by the left.

2.7. Please, arrange your manuscript as follows: **title, author(s), affiliation(s), abstract, keywords, abbreviations, INTRODUCTION, MATERIALS AND METHODS, RESULTS, DISCUSSION (or RESULTS and DISCUSSION), ACKNOWLEDGMENTS, REFERENCES, TABLES, FIGURE CAPTIONS, FIGURES.**

2.8. All **figures** (including photographs) should be submitted on the separate pages at the end of the manuscript (after **Figure captions**) in **MS Word** format. Moreover, **each figure should be provided as a separate file** (1 file = 1 figure) in TIFF, JPG or Word format.

Figures and photographs are printed in black-and-white (**colored photos may be printed only for the additional payment**). The publication of color figures in online version of the Journal is free of charge.

Please, load your figures at 600 dpi (dots per inch) for lineart and not less than 300 dpi for halftones and photos. Use EPS format for figures and diagrams prepared in vector graphic. Try to keep files under 5 MB.

2.9. The manuscript should **be signed by all authors** on the last page as so as the **Copyright Transfer Agreement** should **be signed** by ALL authors in the ORDER they appear in the article first page and the Agreement should be sent to the Editorial Office by e-mail as scan copy with the manuscript.

2.10. On a separate page of the manuscript, it should be provided the **full names of all authors** to help translators correctly transliterate initials in Russian, their postal addresses and telephone and fax numbers, as well as e-mail addresses, and indicate the corresponding author.

2.11. **Manuscript submission.** The *electronic version* is formed as a complete manuscript file with figures. Text files (text + references + tables + figure captions + figures) should be submitted in **Microsoft Word** 6.0 or a later version, using Times New Roman font of 12 point size.

The electronic version of the manuscript (text and figures) and the Copyright Transfer Agreement should be sent as the attachments to the following e-mail address: [fizrast@mail.ru](mailto:fizrast@mail.ru)

**Manuscripts prepared incorrectly or in poor English are not considered.**

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## THE MANUSCRIPT PREPARATION

*There should be 5 empty lines before Title of the manuscript (in first page only)*

**The Title of the manuscript must be concise (no more than 10 words) but informative. Capitalize the First Letters in All Nouns, Pronouns, Adjectives, Verbs, Adverbs, and Subordinate Conjunctions. Avoid nonstandard abbreviations**

**Principal Author <sup>a</sup>, Corresponding author <sup>b 1</sup>, Co-author <sup>c</sup>, Co-author <sup>c</sup>,**

(Authors' initials and surnames should be written with one space between the initials and between the initials and an author's surname. Authors' affiliations should be marked as <sup>a,b,c</sup> etc. Corresponding author should be marked as <sup>1</sup>)

<sup>a</sup> *Full name of Institution (Department Name, Faculty Name, University Name), City, Country*

<sup>b</sup> *Full name of Institution (Department Name, Faculty Name, University Name), City, Country*

<sup>c</sup> *Full name of Institution (Department Name, Faculty Name, University Name), City, Country*

### Received

**Abstract** – The abstract should not exceed 250 words for review papers summarizing the essential features of the article. All papers should be preceded by a concise and informative abstract in which the plant material (binomial, including authority) is given. The abstract should explain the major contributions of the article for the general reader. The abstract is typed as a single paragraph. Citation and discussion of literature are not recommended.

**Keywords:** (no more than 10 items) are listed after the Abstract beginning with the Latin name(s) of the studied organism(s) without author's name. Keywords should be typed by roman font (except the *Latin name(s)*), separated by commas with an interval and arranged as follows:

**Keywords:** *Lycopersicon esculentum*, transgenic tomato plant, ethylene

**Abbreviations:** List of non-standard abbreviations of words or phrases is given at the bottom of the first page. Abbreviations are listed in alphabetical order and arranged as follows: BA–benzyladenine; PSI–photosystem I; WT–wild type.

Please, define non-standard abbreviations when they are first mentioned in the text and in the abstract.

*Corresponding authors:* full name and surname of author responsible for correspondence with the editors and readers, Department of xxxy, Faculty of xxx, xxx University, P.O. Box: 0000-000, City, Country; Tel/Fax: +0-000-000-0000, +0-000-000-0000; E-mails: [author@institute.xxx](mailto:author@institute.xxx)

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## INTRODUCTION

The section on Introduction should include the background (citation of relevant articles published previously) and aims of the research in a comprehensive manner.

**Section headings.** The section headings within the text (INTRODUCTION, MATERIALS AND METHODS, RESULTS, DISCUSSION, REFERENCES) should be placed in the middle of separate lines and written in all capitals without underlining. First-level subheadings (in RESULTS) should follow title capitalization (example: *Cytokinin-Dependent Signal Transduction*) and be placed on separate lines. Second-level subheadings (in MATERIALS AND METHODS) and headings run into a paragraph should follow sentence capitalization (example: **Plant material.**).

## MATERIALS AND METHODS

**Plant material paragraph** should include complete botanical names (genus, species, authority for the binomial, and, when appropriate, cultivar) for all plants studied. Following first mentions, generic names should be abbreviated to the initial except when confusion could arise by reference to genera with the same initial.

**Growth conditions** must be described specifically and clearly.

**New procedures** should be described in sufficient detail to be repeated. A short description of other procedures should also be given. Avoid references like "... as described in [2]" or "... according to [5]." This section should also contain the names of the manufacturers (including country name) of materials and reagents.

*Chemical formulas, mathematical equations and scientific names* should be written with a clear indication of uppercase and lowercase letters (**C** or **c**) or the upper and lower indexes (<sup>32</sup>**P** or **A**<sub>280</sub>). The lower and upper indexes are always typed directly.

*The equations of chemical reactions and mathematical equations* should be typed on a new line, and if there are several equations in the text each of them should be numbered in parentheses in the end of the line.

It is imperative that before submission, authors should carefully proofread the files for special characters, mathematical symbols, Greek letters, equations, tables, references and images, to ensure that they appear in proper format.

**Statistical analysis** of the results should be described. Identify the number of replications and the number of times individual experiments were duplicated. It should be clearly stated whether the standard deviation or the standard error is used.

Second-level subheadings and headings run into a paragraph should follow sentence capitalization (example: **Plant material.**).

## RESULTS

Results should be presented mainly in figures and tables without their detailed discussion.

Double documentation of the same points in figures and tables is not acceptable.

All fractional numbers must be written with dot, but not with comma (for example, **0.1** not **0,1**). **2,4-D** is exception.

First-level subheadings should follow title capitalization (example: *Cytokinin-Dependent Signal Transduction*) and be placed in the middle of separate lines.

## DISCUSSION

The Discussion section should contain an interpretation but not a recapitulation of the results. The Results and Discussion sections may be combined if a description of experimental results is brief or when the interpretation of the previous experiment is required for the logical substantiation of the next one.

**ACKNOWLEDGMENTS.** List of dedications, acknowledgments and funding sources are presented in the end of Discussion section.

**SUPPLEMENTARY MATERIAL.** Supportive/Supplementary material intended for publication in the electronic version of Journal must be numbered and referred to in the manuscript but should not be a part of the submitted paper. List all Supportive/Supplementary Material and include a brief caption line for each file describing its contents. The Supplementary Materials and additional files should be done in Word and PDF formats and prepared according to the specifications (information can get at the Journal editorial office by e-mail).

## REFERENCES

(The list of references should be written on the separate page of the manuscript)

**References** to published papers and books (**no more than 30 – for research papers, no more than 100 – for reviews**); citation of the abstracts of meetings is not recommended.

References should be cited in the same numerical order as they appear in the text in square brackets (for example, **[1]** or **[2–5]**, etc). The references in the text should be on the line.

The list of references must be done **not alphabetically**, but as they appear in the text with its numbers.

In the reference list, all authors should be named unless there are 10 or more. Authors' names should be typed by *italic*. Authors' initials should be written without space between them, and with one space between the initials and an author's surname.

It is necessary to strictly comply with the requirements for the preparation of bibliographic references by analogy with the following examples:

**Book Reference:**

1. Halliwell, B., Gutteridge, J.M.C., *Free Radicals in Biology and Medicine*, Oxford: Oxford University Press, 2007.
2. Vandermeer, J.H., *The Ecology of Intercropping*, Cambridge: Cambridge University Press, 1989.

**Journal Reference:**

1. Brévault, T., Heuberger, S., Zhang, M., Ellers-Kirk, C., Masson, X., Ni, L., Li, X., Tabashnik, B.E., Carriere, Y., Potential shortfall of pyramided Bt cotton for resistance management, *Proc. Natl. Acad. Sci. USA.*, 2013, vol. 110, pp. 5806–5811.
2. Murata, N., Takahashi, S., Nishiyama, Y., Allakhverdiev, S.I., Photoinhibition of photosystem II under environmental stress, *Biochim. Biophys. Acta*, 2007, vol. 1767, pp. 414–421.

For correct abbreviations of journal titles, refer to *Chemical Abstracts Service Source Index* (CASSI).

**Collections of scientific works:**

1. Cuttriss, A.J., Pogson, B.J., Carotenoids, *Plant Pigments and Their Manipulation*, Davies, K.M., Ed., Boca Raton: CRC Press, 2004, pp. 57–91.
2. Fry, W.E., Grünwald, N.J., Cooke, D.E.L., McLeod, A., Forbes, G.A., Cao, K., Population genetics and population diversity of *Phytophthora infestans*, *Oomycete Genetics and Genomics: Diversity, Interactions, and Research Tools*, Lamour, K., Kamoun, S., Eds., Hoboken, New Jersey: Wiley-Blackwell, 2009, pp. 139–164.

**Conference Proceedings:**

1. Mariette, N., Montarry, J., Boulard, F., Mabon, R., Corbière, R., Andrivon, D., Aggressiveness and genetic structure of French populations of *Phytophthora infestans* from 2001 to 2008, Proc. 19th Triennial Conference EAPR2014 (6–11 July, 2014, Brussels), <http://www.eapr.net/eapr-19th-triennial-conference-brussels-belgium-july-2014>

**Articles or chapters in books:**

1. Lichtenthaler, H., Vegetation stress: an introduction to the stress concept in plants, *Vegetation Stress*, Lichtenthaler, H., Ed., Stuttgart: Gustav Fisher, 1996, pp. 4–14.

**Dissertations and Thesis:**

1. Bauer, S., Modeling competition with the field of neighbourhood approach – from individual interactions to population dynamics of plants, *PhD Thesis*, Marburg: Philipps Universität Marburg, 2002.

2. Nesterova, A.N., Effects of lead, cadmium, and zinc ions on the meristem cell arrangement and growth of maize seedling roots, *Cand. Sci. (Biol.) Dissertation*, Moscow: Mosk. Gos. Univ., 1989.

**Patent:**

1. Hoch, J.A., Huang, S., Screening methods for the identification of novel antibiotics, U.S. Patent 6,043,045, March 28, 2000.

**TABLES (no more than 7).** Each table should be provided on a separate page of the manuscript, has a brief title and 1.5 line spacing.

Each column of table should have a heading; units should appear under the column heading(s). Some remarks may be written below the table, but they should not repeat details given in the Materials and Methods section.

If the table is one in the article, then don't write word “**table**” or “**table 1**” in the title above it – just a title. If there is a lot of tables in the article, then write **Table 1.** in bold and further write the title of table in normal type in one line

All tables should be cited in parenthesis with lower case letters in the text, for example – (table 1). If the table is one in the article, then word “**table**” should be typed without numbers in parenthesis

Location of each **table** when it is first mentioned in the text should be noted in the margins of the manuscript **in the square.**

Table 1

**FIGURE CAPTIONS** should be a brief self-sufficient explanation of the illustrations.

Captions should be provided separately from figures on separate page at the end of the text (after **References** and **Tables**).

**FIGURES / Illustrations (no more than 7).**

All figures (including photographs) should be submitted on separate pages at the end of the manuscript (after Figure captions) in **MS Word** format. In addition, each figure should be provided as a separate file (1 file = 1 figure) in TIFF, JPG or MS Word format.

All figures (photographs, graphs, and diagrams) should be cited in the text in parenthesis with lower case letters and numbered consecutively throughout, for example – (**fig. 1**).

Location of each **figure** when it is first mentioned in the text should be noted in the margins of the manuscript **in the square.**

Fig. 1

**Figure number and author's name** should be written in the bottom left-hand corner under the figure (for example, **Fig. 1. Guo**).

Figures should provide enough information to easily understand them. Figure parts should be identified by lowercase roman letters ((a), (b), (c), etc.) in parentheses. The axes of each graph should have numerical scale and measured quantity with units (for example, **CO<sub>2</sub> absorbance,  $\mu\text{mol}/(\text{m}^2 \text{ s})$** , but not **Photosynthesis,  $\mu\text{mol}/(\text{m}^2 \text{ s})$** ). The curves should be defined by *italic Arabic numbers*, and their explanation should be provided in the caption. Supply figures at final size widths: 80 mm (single column) or 160 mm (double column). Maximum depth is 230 mm

**Figures and photographs are printed in black-and-white (colored photos may be printed only for the additional payment). The publication of color figures in online version of the Journal is free of charge.**

#### **Editorial processing (reviewing, editing, and proofs).**

Simultaneously with the submission of the manuscript to the Editorial Office the author should sign Copyright Transfer Agreement. This Agreement should **be signed by hand** by ALL authors in the ORDER they appear in the article first page and the Agreement should be sent to the Editorial Office by e-mail as scan copy.

The Editorial Office informs authors by e-mail that a manuscript is received.

**Manuscripts prepared incorrectly or in poor English are not considered.**

All manuscripts submitted will be reviewed (in case the authors complied with the rules of the manuscript preparation). The reviewer evaluates the manuscript, suggests improvements and recommends accepting or declining the paper. Manuscripts and reviewer's comments are emailed to the authors. Revised manuscripts with point-by-point responses to the referee should be returned within 30 days; otherwise, they will be treated as new submissions. If the revised manuscript is not received within two months, it is rejected. The manuscript is then subjected to scientific editing. Accepted manuscripts are published in correspondence with the date of their receiving. Papers containing new information of exceptional significance may be, on the proposal of the Editor-in-Chief, published first in the shortest possible time.

By submitting an article to the Journal, the author ensures that the corresponding material (original or translated into other languages) have never been published and is not under consideration for publication in other publishing houses.

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*Units of Measure, Symbols, and Abbreviations*

*Basic SI units:*

A – ampere; Bq – becquerel; D – dalton; E – einstein; F – farad; G – gauss; g – gram; h – hour; Hz – hertz; J – joule; l – liter; m – meter; min – minute; N – newton; Pa – pascal; R – roentgen; Gr – gray; s – second; V – volt; W – watt;  $\Omega$  – ohm.

*Use the following multiplying prefixes for the appropriate units:*

P – peta  $10^{15}$ ; T – tera  $10^{12}$ ; G – giga  $10^9$ ; M – mega  $10^6$ ; k – kilo  $10^3$ ; d – deci  $10^{-1}$ ; c – centi  $10^{-2}$ ; m – milli  $10^{-3}$ ;  $\mu$  – micro  $10^{-6}$ ; n – nano  $10^{-9}$ ; p – pico  $10^{-12}$ ; f – femto  $10^{-15}$ .

Do not use negative exponents to indicate units, e.g., use  $\mu\text{mol}/(\text{m}^2 \text{ s})$  rather than  $\mu\text{mol m}^{-2} \text{ s}^{-1}$ .

*Use without definition the following abbreviations:*

atm – atmosphere

bp – base pair

cpm – counts per min

cv. – cultivar

dpm – disintegrations per min

dry wt – dry weight

equiv – equivalent

fr wt – fresh weight

*g* – gravity

ha – hectare

K – degrees Kelvin

kb – kilobase

$K_M$  – Michaelis constant

mol – mole

mol wt – molecular weight

osmol – osmole

pI – isoelectric point

ppm – parts per million

rpm – revolutions per minute

$R_f$  – retardation factor

SD – standard deviation

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SE – standard error

sp. – species

UV – ultraviolet

var. – variety

vol. – volume (but v/v, not vol/vol)

wt – weight (as a measure of material) (but w/v, not wt/vol)

*Methods:*

ANOVA – analysis of variance

ELISA – enzyme-linked immunosorbent assay

ESR – electron spin resonance

FPLC – fast protein liquid chromatography

GC – gas chromatography

IEF – isoelectric focusing

HPLC – high performance liquid chromatography

RP-HPLC – reverse-phase HPLC

MS – mass spectrometry

NMR – nuclear magnetic resonance

PAGE – polyacrylamide gel electrophoresis

PCR – polymerase chain reaction

RACE – rapid amplification of cDNA ends

RFLP – restriction fragment length polymorphism

RT-PCR – reverse transcription PCR

SDS-PAGE – denaturing PAGE

TLC – thin-layer chromatography

*Chemicals:*

ABA – abscisic acid

AMP, ADP, ATP – adenosine mono-, di-, triphosphate

ATPase – adenosine triphosphatase

BSA – bovine serum albumin

buffers: Tris, Mes, Hepes, Pipes

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cAMP, cGMP – cyclic monophosphates  
CMP, CDP, CTP – cytidine mono-, di-, triphosphate  
CoA, AcetylCoA – coenzyme A, acetylcoenzyme A  
2,4-D – 2,4-dichlorophenoxyacetic acid  
DNA – deoxyribonucleic acid  
cDNA – complementary DNA  
ctDNA – chloroplast DNA  
mtDNA – mitochondrial DNA  
nDNA – nuclear DNA  
snDNA – small nuclear DNA  
ssDNA, dsDNA – single-stranded DNA, double-stranded DNA  
DNase – deoxyribonuclease  
EDTA – ethylenediaminetetraacetate  
EGTA – ethyleneglycol-*bis* (*b*-aminoethylether)  
N,N,N',N'-tetraacetic acid  
FAD – flavine adenine dinucleotide  
FADH<sub>2</sub> – its reduced form  
GA – gibberellin  
GA<sub>3</sub> – gibberellic acid  
GMP, GDP, GTP – guanosine mono-, di-, triphosphate  
IgG, IgM, etc – immunoglobulin G, M, etc.  
IAA – indoleacetic acid  
MDA – malondialdehyde  
MS medium – Murashige and Skoog nutrient medium  
NAA – naphthalene acetic acid  
NAD – nicotinamide adenine dinucleotide  
NADH – its reduced form  
NADP – nicotinamide adenine dinucleotide phosphate  
NADPH – its reduced form  
PAAG – polyacrylamide gel  
PEG – polyethylene glycol  
poly(A) – polyadenylate  
RNA – ribonucleic acid

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cRNA – complementary RNA

hnRNA – heterogenous nuclear RNA

mRNA – messenger RNA

rRNA – ribosomal RNA

snRNA – small nuclear RNA

tRNA – transfer RNA

se – ribonuclease

RNP – ribonucleoprotein

ROS – reactive oxygen species

Rubisco – ribulose-1,5-bisphosphate carboxylase/oxygenase

SDS – sodium dodecyl sulfate

TCA – trichloroacetic acid

UMP, UDP, UTP – uridine mono-, di-, triphosphate

*Amino Acids:*

Use the three-letter symbols (or the one-letter symbols in the case of protein sequences):

Ala(A) – alanine

Arg(R) – arginine

Asn(N) – asparagine

Asp(D) – aspartic acid

Cys(C) – cysteine

Gln(Q) – glutamine

Glu(E) – glutamic acid

Gly(G) – glycine

His(H) – histidine

Hyp(O) – hydroxyproline

Ile(I) – isoleucine

Leu(L) – leucine

Lys(K) – lysine

Met(M) – methionine

Orn – ornithine

Phe(F) – phenylalanine

Pro(P) – proline

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Ser(S) – serine

Thr(T) – threonine

Trp(W) – tryptophan

Tyr(Y) – tyrosine

Val(V) – valine

*Sugars:*

Ara – arabinose

dRib – deoxyribose

Fru – fructose

Fuc – fucose

Gal – galactose

Glu – glucose

Man – mannose

Raf – raffinose

Rib – ribose

Suc – sucrose

UDP-Gal – uridine diphosphate galactose

Xyl – xylose

*The following need to be defined if used:*

*Chemicals:*

Ab – antibody

mAb – monoclonal antibody

AD – actinomycin D

AP – action potential

BA – benzyladenine

BEP – bioelectric potential

CH – cycloheximide

CCC – chlorocholine chloride

Chlide – chlorophyllide

CM-cellulose – carboxymethylcellulose

ConA – concanavalin A

Cyt – cytochrome

DTT – dithiothreitol

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DCMU – dichlorophenyldimethylurea, diuron  
DMSO – dimethyl sulfoxide  
DNP – 2,4-dinitrophenol  
FA – fatty acids  
Fd – ferredoxin  
GABA –  $\gamma$ -aminobutyric acid  
GSH, GSSG – glutathione, reduced and oxidized  
IMP, IDP, ITP – inosine mono-, di-, triphosphate  
IPA – isopentenyladenine  
PAL – phenylalanine ammonia-lyase  
PBS – phosphate-buffered saline  
PC – phosphatidylcholine  
Pchl – protochlorophyll  
Pchl<sub>ide</sub> – protochlorophyllide  
PE – phosphatidylethanolamine  
PEP – phosphoenolpyruvate  
PEPC – phosphoenolpyruvate carboxylase  
P<sub>fr</sub> – phytochrome, far-red absorbing  
P<sub>r</sub> – phytochrome, red absorbing  
P<sub>i</sub> – phosphate (inorganic)  
PK/PKC – protein kinase/protein kinase C  
PP<sub>i</sub> – pyrophosphate  
PMSF – phenylmethylsulfonyl fluoride  
SHAM – salicylhydroxamic acid  
SSC – standard saline citrate  
UTR – untranslated region  
Z – zeatin  
ZR – zeatin riboside

*Other abbreviations:*

C<sub>3</sub> plant (not C<sub>3</sub>-plant)  
C<sub>4</sub> plant (not C<sub>4</sub>-plant)  
CAM – crassulacean acid metabolism

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2D/3D – two-dimensional/three-dimensional  
DAF – days after flowering  
DAP – days after pollination  
ER – endoplasmic reticulum  
ETC – electron transport chain  
EU – enzyme unit  
FR – far-red light  
IC<sub>50</sub> – inhibitory concentration (50% inhibition)  
IR – infrared  
IRGA – infrared gas analyzer  
isotopes – <sup>14</sup>C, <sup>3</sup>H, etc.  
LD – long day  
LD<sub>50</sub> – lethal dose (50% survival)  
LHC – light-harvesting complex  
lx – lux  
MF – microfilaments  
MT – microtubules  
ORF – open reading frame  
PAR – photosynthetically active radiation  
PPFD – photosynthetic photon flux density, mmol/(m<sup>2</sup> s)  
PFD – photon flux density, mmol/(m<sup>2</sup> s)  
POL – peroxidation of lipids  
PSI – photosystem I  
PSII – photosystem II  
R – red light  
RC – respiratory control  
RNA polymerase (not RNA-polymerase)  
RH – relative humidity  
SD – short day  
X-rays – Roentgen rays

*Abbreviations used in tables:*

A – absorbance ( $A_{320}$ )

chl – chlorophyll

conc – concentration

const – constant

exp – experiment

$F$  – fluorescence ( $F_{720}$ )

LSD – least significant difference

nd – not determined, no data

ns – not significant

temp – temperature