

The Ohio Journal of

# SCIENCE

*AN INTERNATIONAL MULTIDISCIPLINARY JOURNAL*

Volume 107

April 2007

Number 2



# THE OHIO JOURNAL OF SCIENCE

ISSN 0030-0950

## Editorial Policy

### General

*THE OHIO JOURNAL OF SCIENCE* considers original contributions from members and non-members of the Academy in all fields of science. While special consideration will be given to manuscripts concerned with Ohio subject matter, other reports with scientific merit will be reviewed for publication. Submission of a manuscript is understood to mean that the work is original and unpublished, and is not being considered for publication elsewhere. All manuscripts considered for publication will be peer-reviewed. The opinions expressed by reviewers are their own, and do not represent the views of the Ohio Academy of Science or *THE OHIO JOURNAL OF SCIENCE*.

### Page Charges

Publication in *The Ohio Journal of Science* requires authors to assist in meeting publication expenses. These costs will be assessed at \$85 per page for members of the Academy and \$120 per page for nonmembers. In multi-authored papers, each author must be a member of the Academy at the time of publication to be eligible for the reduced member rate. Papers that exceed 12 printed pages may be charged full production costs.

### Submission

Please submit two copies of manuscripts and illustrations accompanied by a CD-ROM with a text file in MSWord and separate files of each illustration in tiff format in accord with current guidelines posted at <http://www.ohiosci.org/ojsinstr.htm>. Original photographs or transparencies and high resolution line art prints of maps or graphs are also acceptable. Additionally, as accessible from the guidelines web page, the following forms must be submitted with the manuscript: (1) affirmation of originality, (2) copyright transfer and (3) page charge acceptance.

Please submit all materials to:

#### Manuscript Processing

*The Ohio Journal of Science*  
1500 W Third Ave Ste 228  
Columbus OH 43212-2817

For technical questions about  
electronic formats or other  
details for submission, contact:

Phone: 614-488-2228

Fax: 614-488-7629

Email: [oasresponse@iwaynet.net](mailto:oasresponse@iwaynet.net)

Please contact the Editor directly for general questions regarding content or appropriateness of submission:

DR. KERRY L. CHEESMAN, Editor  
Biological Sciences Department  
Battelle Hall, Capital University  
1 College and Main  
Columbus, OH 43209-2394 USA

Phone: 614-236-6951 (office) or 614-236-6520 (secretary)

Fax: 614-236-6518 Email: [OJSeditor@capital.edu](mailto:OJSeditor@capital.edu)

### Failure to Receive *THE JOURNAL*

Any claim of failure to receive subscription issues of *THE JOURNAL* must be submitted to the Ohio Academy of Science within six months of date of issue of the missing number, to be recognized.

### Listing Services

*THE OHIO JOURNAL OF SCIENCE* is listed or abstracted in several sources including:

AcadSci Abstracts  
Bibliography of Agriculture  
Biological Abstracts  
Chemical Abstracts  
Current Advances in Ecological Sciences  
Current Contents (Agriculture, Biology &  
Environmental Sciences)  
Deep Sea Research and Oceanography Abstracts  
Environment Abstracts  
Environmental Information Center  
Forest Products Abstracts  
Forestry Abstracts  
Geo Abstracts  
GEOBASE  
Geology Abstracts  
GeoRef  
Helminthological Abstracts  
Horticulture Abstracts  
Nuclear Science Abstracts  
Review of Plant Pathology  
Selected Water Resources Abstracts  
World Agricultural Economics and Rural  
Sociology Abstracts

### FUTURE ACADEMY MEETINGS

2008 The University of Toledo

TYPESETTING, PAGE LAYOUT, AND EDITORIAL  
PROOFREADING — ARDELLA PIERCE

Date of Issue — April 2007

Copyright © 2007 by The Ohio Academy of Science  
Printing — Russett Printing, Zanesville, OH USA

The Ohio Journal of **\* Digital**  
**SCIENCE Archives**

**Knowledge**  
**Bank** \*SINCE 1900

OHIO STATE UNIVERSITY

UNIVERSITY LIBRARIES AND OFFICE OF THE CHIEF INFORMATION OFFICER  
[WWW.OHIOSCI.ORG/OJS.HTM](http://WWW.OHIOSCI.ORG/OJS.HTM)

# The Ohio Journal of Science

AN INTERNATIONAL MULTIDISCIPLINARY JOURNAL

Volume 107

April 2007

No. 2



## *The Ohio Journal of Science*

Manuscript submission guidelines  
<http://www.ohiosci.org/ojsinstr.htm>

Submit all manuscripts to:  
**Manuscript Processing**  
*The Ohio Journal of Science*  
1500 W Third Ave Ste 228  
Columbus OH 43212-2817

For technical questions about electronic  
formats or other submission details:  
Phone: 614-488-2228 • Fax: 614-488-7629  
Email: [oasresponse@iwaynet.net](mailto:oasresponse@iwaynet.net)

Please direct editorial questions to:

DR. KERRY L. CHEESMAN, Editor  
*The Ohio Journal of Science*  
Biological Sciences Department  
Battelle Hall, Capital University  
1 College and Main  
Columbus, OH 43209-2394  
Phone: 614-236-6951 (office) or  
614-236-6520 (secretary)  
Fax: 614-236-6518  
Email: [OJSeditor@capital.edu](mailto:OJSeditor@capital.edu)

**The Ohio Academy of Science**  
1500 W Third Ave Ste 228  
Columbus OH 43212-2817  
Phone: 614-488-2228  
Fax: 614-488-7629  
Email: [oas@iwaynet.net](mailto:oas@iwaynet.net)  
Website: <http://www.ohiosci.org>

### OFFICERS

President – JAMES Y. TONG  
Chief Exec. Officer – LYNN E. ELFNER  
President-Elect – pending election  
Past President – MARK J. CAMP  
Secretary – DON GRUBBS  
Treasurer – MICHAEL HERSCHLER  
Development Council Director – RICHARD W.  
JANSON  
Jr Academy Council Dir. – DAVID M. WEANER  
Parent Advisory Council Dir. – KATHERINE  
WATKINS  
Student Advisory Council Dir. – YOONHEE HA

*The Ohio Journal of Science* (ISSN 0030-0950) is published in March, April, June, September, and December by The Ohio Academy of Science, 1500 W Third Avenue Suite 228, Columbus OH 43212-2817. Individual membership and subscription: \$75. Domestic institutional subscription: \$75; Foreign institutional subscription: \$90. Single issues for Academy members: \$10; others \$15. © 2007 by The Ohio Academy of Science. ALL RIGHTS RESERVED. Printed in The United States of America.

POSTMASTER:  
Send address changes to:  
*The Ohio Journal of Science*  
1500 W Third Ave Ste 228  
Columbus OH 43212-2817 USA

## ARTICLES

- 2 The Culture of Economic Development in Ohio: A Case Study in Defiance County by K. D. Johnson-Webb and M. C. Zeller
- 10 The Effectiveness of a Local Public Health Program to Influence Fitness and Nutrition Goals in Children by D. E. Brannen, J. Rickels, R. Hill, and M. McDonnell
- 16 Efficacy of a Multiple-Capture Live Trap for Small Mammals by J. L. Belant and S. K. Windels
- 19 The Effects of Polychlorinated Biphenyl on Circulating Leptin and Thyroid Hormone Status in Sprague-Dawley Rats, *Rattus norvegicus* by T. Provost, M. Kennedy, V. D. Castracane, and L. A. Meserve

## ANNOUNCEMENT

- 23 Environmental Science and Engineering Scholarship Application

INSTRUCTIONS TO AUTHORS — inside back cover

COVER PHOTO: Bloodroot (*Sanguinaria canadensis*) is one of Ohio's earliest native spring wildflowers, seen March through May throughout the state in rich woodland habitats. The flower stalk grows 6-10" tall from the center of a single, deeply lobed leaf; the flower is 1-2" wide, white with yellow stamens. The genus name comes from the Latin meaning "blood," and refers to the bright red juice of the rootstock and stem. Various cultures have used these fluids for dyes and insect repellent. (Photo taken April 2004 in Delaware County by Kerry Cheesman.)