

POLISH

*JOURNAL OF ENVIRONMENTAL
STUDIES*



HARD OLSZTYN

Vol. 29, No. 4, 2020

POLISH JOURNAL OF ENVIRONMENTAL STUDIES

EDITOR

JERZY RADECKI

EXECUTIVE EDITORS:

HANNA RADECKA

DOROTA RADECKA

ASSOCIATE EDITOR

DAVID GONNERMAN

EDITORIAL BOARD:

IMRAN ALI

Southwest University of Science and
Technology, Mianyang, China

IRENA BARANOWSKA

Polytechnic of Silesia, Gliwice, Poland

LIGITA BALEŽENTIENĖ

Vytautas Magnus University, Kaunas
district, Lithuania

JAN BOGACKI

Warsaw University of Technology, Poland

BOGUSŁAW BUSZEWSKI

Nicolaus Copernicus University, Toruń,
Poland

MEHMET CETIN

Kastamonu University, Kastamonu,
TURKEY

LUKASZ CHRZANOWSKI

Poznań University of Technology, Poland

JAN DERCO

Slovak University of Technology,
Bratislava, Slovakia

JAN DOBROWOLSKI

AGH University of Science and
Technology, Kraków, Poland

HÉCTOR FERNÁNDEZ

Universidad Nacional De Rio Cuarto,
Departamento de Quimica, Rio Cuarto,
Argentina

S. J. S. FLORA

National Institute of Pharmaceutical
Education and Research (NIPER),
INDIA

EWA FLOREK

University of Medical Sciences, Poznań,
Poland

MAGDALENA GANTNER

Warsaw University of Life Sciences, Poland

JANINA GOSPODAREK

University of Agriculture, Cracow, Poland

MARIA HEPEL

Potsdam College, The State University
of New York, USA

PIOTR HERBUT

University of Agriculture, Cracow, Poland

YUH-SHAN HO

College of Environmental Sciences, Peking
University, Beijing, People's Republic
of China

MIROSLAV HUTNAN

Slovak University of Technology, Slovakia

DANA - ADRIANA ILUTIU - VARVARA

Technical University of Cluj – Napoca,
Romania

MUNAWAR IQBAL

University of Lahore, Lahore, Pakistan

HARRY D. KAMBEZIDIS

National Observatory of Athens, Greece

HANNA KLIKOCA

University of Life Sciences in Lublin,
Poland

MONIKA KOWALSKA-GÓRALSKA

Institute of Biology, Wrocław, Poland

ANNA KOZAK

Adam Mickiewicz University in Poznań,
Poland

MALGORZATA KRZYWONOS

Wrocław University of Economics, Poland

JAN KUCHARSKI

University of Warmia and Mazury
in Olsztyn, Poland

E. KUDJO DZANTOR

Tennessee State University, USA

ROBERTO LAI

University of Sassari, Italy

ULRICH LÜTTGE

Institute of Botany, TH Darmstadt,
Germany

GRZEGORZ MAJ

University of Life Sciences in Lublin,
Poland

SHELLEY MINTER

University of Utah, Department of
Chemistry, Salt Lake City, USA

JACEK NAMIESNIK

Chemical Faculty, Gdansk University
of Technology, Poland

CEMILE OZCAN

Kirklareli University, TURKEY

DAINIUS PALIULIS

Vilnius Gediminas Technical University,
Lithuania

MARIUSZ PELECHATY

University of Adam Mickiewicz, Poznań,
Poland

FÁBIO PORTELLA

Federal University of Pernambuco, Recife,
Brazil

FERNANDO PORTO

Federal Rural University of Pernambuco,
Recife, Brazil

BALTRENAS PRANAS

Vilnius Gediminas Technical University
(VGTU), Lithuania

STANISŁAW PRZESTALSKI

University of Agriculture, Wrocław, Poland

MAHMOOD QAISAR

COMSATS University Abbottabad,
Pakistan

GUNNO RENMAN

Royal Institute of Technology, Stockholm,
Sweden

ROBERTO RICO-MARTÍNEZ

Autonomous University of Aguascalientes,
Aguascalientes, Mexico

JERZY SIEPAK

University of Adam Mickiewicz, Poznań,
Poland

PEDRO SIMÕES

CERIS-IST, University of Lisbon, Portugal

MITSUYUKI SOMA

University of Shizuoka, Shizuoka 422,
Japan

AGATA SZYMAŃSKA-PULIKOWSKA

University of Life Sciences in Wrocław,
Poland

YUKINORI TANI

University of Shizuoka, Japan

CEM TOKATLI

Trakya University, Ipsala Vocational
School, Edirne – Turkey

ASHOK VASEASHTA

U.S. Department of State, Washington,
USA

**CARLOS EDUARDO FRONTANA
VÁZQUEZ**

Centra de Investigacion y Desarrollo
Tecnologico en Electroquimica, Cideteq,
SC, Queretaro, Mexico

HEINZ-RUDOLF VOIGT

University of Helsinki, Finland

JAN VYMAZAL

Czech University of Life Sciences Prague,
Czech Republic

AMIR WASEEM

Quaid-i-Azam University, Islamabad-
45320, Pakistan

AGNIESZKA WOLIŃSKA

The John Paul II (The Second) Catholic
University of Lublin, Poland

NOTES TO AUTHORS

The following types of articles will be published:

- Full length research paper – describing original research;
- Short Communication – short research articles intended to present exciting findings that will have a major impact in environmental science;
- Reviews – should be a critical evaluation of the current stage of research on a particular environmental problem;
- Invited accelerated articles – stimulating the up-to-date research;

The submitted manuscripts, which must not have been published elsewhere, will be reviewed by The Editorial Board Members of the “Polish Journal of Environmental Studies,” assisted by Referees.

Authors of papers involving experiments with animals are requested to include the opinion and approval of Local Committee of Ethics.

The recommended order of presentation

- **Title.**
- **Author's name and affiliations, e-mail address.**
- **Abstract.** An abstract stating the results and the novel aspects of the work and findings.
- **Keywords.** Up to 5 keywords or key phrases, indicating the topic of importance in the work.
- **Introduction.** An introductory statement of the subject under investigation with any essential historical background.
- **Experimental Procedures.** Working details must be given concisely; well-known operations should not be described in detail.
- **Results.** These could be presented in tabular or graph form, with appropriate statistical evaluation.
- **Discussion of Results.** The consolidation of the study and general implications should be presented and discussed with up-to-date scientific literature.
- **Conclusions.** Should include significance of the findings and recommendations for future work.
- **Acknowledgements.**
- **Units and Nomenclature.** The SI system of units and current internationally recognized (IUPAC) chemical nomenclature should be used. Common trivial names may be used, but should first be defined in terms of IUPAC nomenclature.
- **References** should be indicated in the text by consecutive numbers and the full references should be listed in the same order at the end of the article in the following form:

References

1. KŁOS-WITKOWSKA A. Enzyme-based fluorescent biosensors and their environmental, clinical and industrial applications. *Pol. J. Environ. Stud.* **24**(1), 19, **2015**.
2. CHEN T. Y., LAI P. Y. A comparative study of energy utilization efficiency between Taiwan and China. *Energ. Policy.* **38** (5), 2386, **2010**.
3. HEPPEL M., ZHONG C. J. Functional nanoparticles for bioanalysis, nanomedicine and bioelectronics devices. ACS symposium series; 1112, USA, **2012**.

The following parameters should be used for manuscript preparation:

- Spacing 1.5, font size 12, and a margin of 2.5 cm on all four sides of the paper
- Tables and figures should be included after references
- The most popular word processor file formats are recommended

Proofs

Proofs should be carefully checked by corresponding Author and returned on time to Editors.

On-line manuscript submission

Please create an account and log in at:

www.editorialsystem.com/pjoes

In the case of any problem, please do not hesitate to contact with us via e-mail:

office@pjoes.com

After submission, each manuscript will be assigned an editorial number that authors should use in all correspondence with journal staff.

Payment

The price of publishing in “Polish Journal of Environmental Studies” is **33 EURO +0% VAT** and **132 PLN +8% VAT** per one page of manuscript for foreign and Polish Authors, respectively. Each Figure and each Table is considered as one page of manuscript. The price includes high quality PDF of article, which will be send to corresponding Author.

***In the 2018 Journal Citation Reports:
– Impact Factor: 1.186***

ISO Abbrev. Title: Pol. J. Environ. Stud.

The “Polish Journal of Environmental Studies” is indexed and abstracted in: Chemical Abstracts; Ulrich's International Periodicals Directory; R.R., Bowker; USA; CAB International, Oxon, U.K.; Environmental Abstracts, Congressional Information Service, Maryland, USA; Zoological Record-BIOSIS, U.K.; International Soil Reference and Information Centre, the Netherlands; AGRIS FAO – Central Agricultural Library, Warsaw, Poland; Current Contents/Agriculture; Biology and Environmental Sciences; Sciences Citation Index Expanded; EBSCO Information Services; ELSEVIER Bibliographic Databases; AGRO Data Bases.

**Visit us at: <http://www.pjoes.com>
Our e-mail: officehard@pjoes.com**

SUBSCRIPTION INFORMATION

"Polish Journal of Environmental Studies"
(ISSN 1230-1485)
is published bimonthly since 1996.
Subscription rates for Volume 29 (2020) are:
Institutions: 144 EURO + 0% VAT
(six issues per year)
Individuals: 48 EURO + 0% VAT
(six issues per year)

ORDER FORM of "Polish Journal of Environmental Studies"

Volume:
Year:
Number of issues:
Institution:
- name
- address
- VAT number

Please send the order to:
"Polish Journal of Environmental Studies"
"HARD" Publishing Company
Post-Office Box 6
10-718 OLSZTYN 5, POLAND
tel. (48-89) 523-46-36
fax: (48-89) 524-01-24
e-mail: officehard@pjoes.com

Method of payment:
Please send payments to the account of
Polska Kasa Opieki S.A., Oddział Olsztyn, Poland
number: **PL 19124015901111000014317981**
SWIFT: PKOPPLPW

ISSN 1230-1485

INFORMACJE O PRENUMERACIE

„Polish Journal of Environmental Studies”
(ISSN 1230-1485)
jest dwumiesięcznikiem od 1996 roku.
Roczna prenumerata tomu 29 (2020) wynosi dla:
Instytucji: 180 PLN + 8% VAT (6 numerów w roku)
Indywidualnych odbiorców: 72 PLN + 8% VAT
(6 numerów w roku)

FORMA ZAMÓWIENIA PRENUMERATY „Polish Journal of Environmental Studies”

Numer tomu:
Rok:
Ilość egzemplarzy:
Instytucja zamawiająca:
- Nazwa
- Adres
- Nr NIP

Zamówienie należy przesłać na adres:
„Polish Journal of Environmental Studies”
Redakcja HARD Publishing Company
Przegródka pocztowa 6
10-718 OLSZTYN 5
tel. (48-89) 523-46-36
fax: (48-89) 524-01-24
e-mail: officehard@pjoes.com

Sposób opłacenia:
Proszę przekazać opłatę na rachunek
Polska Kasa Opieki S.A., Oddział Olsztyn
numer: **19124015901111000014317981**