

2025 Volume 17 Issue 3



# NOTULÆ SCIENTIÆ BIOLOGICÆ





# NOTULAE SCIENTIA BIOLOGICAE

2025 Volume 17, Issue 3

***Publisher:***

*Society of Land Measurements and Cadastre from Transylvania (SMTCT)*

**Abstracted and/or indexed:**

- [Scopus](#) ([CiteScore](#); [CiteScore rank & trend](#); [Scopus content coverage](#)). Subject area:
  - Agricultural and Biological Sciences: Agricultural and Biological Sciences (miscellaneous)
  - Agricultural and Biological Sciences: Agronomy and Crop Science
  - Agricultural and Biological Sciences: Forestry
  - Agricultural and Biological Sciences: Horticulture
  - Agricultural and Biological Sciences: Plant Science
  - Biochemistry, Genetics and Molecular Biology: Biochemistry, Genetics and Molecular Biology (miscellaneous)
  - Medicine: Medicine (miscellaneous)
- [Directory of Open Access Journals](#)
- [Elton B Stephens Company \(EBSCO\)](#)
- [ProQuest](#)
- [Centre for Agriculture and Biosciences International \(CABI\)](#)
- [Chemical Abstracts Service \(CAS\)](#)
- [Ulrich's Periodicals Directory](#)
- [Bielefeld Academic Search Engine \(BASE\)](#)
- [British Library Direct \(BLD\)](#)
- [OCLC WorldCat](#)
- [Harvard Library](#)
- [CrossRef](#)
- [Information Matrix for the Analysis of Journals \(MIAR\)](#)
- [Google Scholar](#)
- [Scilit](#)
- [Research Commons - Web of Science Platform](#) (Clarivate)

ISSN 2067-3264

[www.notulaebiologicae.ro](http://www.notulaebiologicae.ro)

## Editorial Board

### Editors-in-Chief

- [Radu E. SESTRAS](#), University of Agricultural Sciences and Veterinary Medicine (UASVM) Cluj-Napoca, Romania
- [Sorana D. BOLBOACĂ](#), University of Medicine and Pharmacy, Cluj-Napoca, Romania
- [Oscar VICENTE](#), COMAV, Universitat Politècnica de València, Valencia, Spain

### Advisory Editors

- [Cornel CĂTOI](#), University of Agricultural Sciences and Veterinary Medicine (UASVM) Cluj-Napoca, Romania
- [Doru C. PAMFIL](#), Romanian Academy, Cluj-Napoca Branch, Romania
- [Paul SESTRAS](#), Society of Land Measurements and Cadastre from Transylvania, Romania

### Associate Editors

- [Monica BOSCAIU](#), Polytechnic University of Valencia, Spain
- [Milić ČUROVIĆ](#), Montenegro University, Podgorica, Montenegro
- [Hossam S. EL-BELTAGI](#), Cairo University, Egypt; King Faisal University, Al-Ahsa, Saudi Arabia
- [Lorentz JÄNTSCHI](#), Polytechnic University of Cluj-Napoca, Romania
- [Ioanna KAKABOUKI](#), Agricultural University of Athens, Iera Odos, 75, 11855, Athens, Greece
- [Kamil KUČA](#), University of Hradec Králové, Hradec Králové, Czech Republic
- [Leonardo LEONARDI](#), University of Perugia, Italy
- [Allan Klynger Da Silva LOBATO](#), Universidade Federal Rural da Amazõnia, Paragominas, Brazil
- [Felicia LOGHIN](#), University of Medicine and Pharmacy, Cluj-Napoca, Romania
- [Andrei Daniel MIHALCA](#), UASVM Cluj-Napoca, Romania
- [Andrei MOCAN](#), University of Medicine and Pharmacy, Cluj-Napoca, Romania
- [José Alberto PEREIRA](#), Instit. Politécnico de Bragança, Portugal
- [Ioana Delia POP](#), UASVM Cluj-Napoca, Romania
- [Mihai PUȘCAS](#), Babeș-Bolyai University, 400084 Cluj-Napoca, Romania
- [Agnieszka SEKARA](#), Agricultural University of Kraków, Kraków, Poland
- [Adriana F. SESTRAS](#), UASVM Cluj-Napoca, Romania
- [Lei SHI](#), Huazhong Agricultural University, Wuhan, China
- [Pilar S. TESTILLANO](#), Biological Research Centre, Madrid, Spain
- [Robert VEBERIČ](#), University of Ljubljana, Ljubljana, Slovenia
- [Dan VODNAR](#), UASVM Cluj-Napoca, Romania

## Editorial Board - Scientific Members & Section Editors

- [Anthony Jide AFOLAYAN](#), University of Fort Hare, Alice Campus, South Africa
- [Ioan Vasile ABRUDAN](#), Transilvania University, Braşov, Romania
- [Douglas D. ARCHBOLD](#), University of Kentucky, Lexington, USA
- [Grigore BĂCIUT](#), University of Medicine and Pharmacy, Cluj-Napoca, Romania
- [Umberto BERNABUCCI](#), University of Tuscia, Viterbo, Italy
- [Dimitrios BILALIS](#), Agricultural University of Athens, Athens, Greece
- [Anca Dana BUZOIANU](#), University of Medicine and Pharmacy, Cluj-Napoca, Romania
- [Suriyan CHA-UM](#), National Center for Genetic Engineering & Biotechnology - BIOTEC, Thailand
- [Ioan COMAN](#), University of Medicine and Pharmacy, Cluj-Napoca, Romania
- [Vasile CRISTEA](#), Babes-Bolyai University, Cluj-Napoca, Romania
- [Róbert FARKAS](#), Szent István University, Budapest, Hungary
- [Ana FITA](#), Polytechnic University of Valencia, Spain
- [László FODOR](#), Szent István University, Budapest, Hungary
- [Marek GAJEWSKI](#), Warsaw Agricultural University, Warsaw, Poland
- [Stefano GREGO](#), University of Tuscia, Viterbo, Italy
- [Florin IORAS](#), Buckinghamshire New University, High Wycombe, United Kingdom
- [Alexandru IRIMIE](#), 'Ion Chiricuta' Cancer Institute, Cluj-Napoca, Romania
- [Kaushalendra Kumar JHA](#), Indian Institute of Forest Management, Bhopal, India
- [Stefania MASCI](#), University of Tuscia, Viterbo, Italy
- [Dan MIHU](#), University of Medicine and Pharmacy, Cluj-Napoca, Romania
- [Meena MISRA](#), Institute of Frontier Sciences&Biotechnology, Baramunda, Bhubaneswar, India
- [Bernardo MURILLO-AMADOR](#), Centro de Investigaciones Biologicas del Noroeste, La Paz, Mexico
- [Vladimir PEŠIĆ](#), University of Montenegro, Podgorica, Montenegro
- [Neiva Izabel PIEROZZI](#), Instituto Agronômico de Campinas, CPDR Geneticos Vegetais, Brazil
- [Jaime PROHENS](#), Polytechnic University of Valencia, Valencia, Spain
- [Cosmin I. PUIA](#), University of Medicine and Pharmacy, Cluj-Napoca, Romania
- [Chen QIN](#), School of Life Science, Shanghai Univ., Shanghai, China
- [Adrián RODRÍGUEZ-BURRUEZO](#), Polytechnic University of Valencia, Valencia, Spain
- [Marco SARIGU](#), Università degli Studi di Cagliari, Cagliari, Italy
- [Klaus SCHALLER](#), Research Center Geisenheim, Geisenheim, Germany
- [Anoop Kumar SRIVASTAVA](#), ICAR – Central Citrus Research Institute, Nagpur, India
- [Franci STAMPAR](#), University of Ljubljana, Ljubljana, Slovenia
- [Feng XU](#), Yangtze University, Jingzhou 434025, Hubei Province, China

## Editorial and Administrative Support

- [Adriana D. BACIU](#), UASVM Cluj-Napoca, Romania
- [Cătălina DAN](#), UASVM Cluj-Napoca, Romania
- [Mihail KANTOR](#), Mycology and Nematology Genetic Diversity and Biology Laboratory USDA, ARS, Beltsville, MD 20705, USA
- [Laura Ioana MACAVEI](#), Università degli Studi di Modena e Reggio Emilia, Modena, Italy
- [Lucica MIHALTE](#), UASVM Cluj-Napoca, Romania
- [Diana-Maria MIRCEA](#), UASVM Cluj-Napoca, Romania
- [Irina M. MORAR](#), UASVM Cluj-Napoca, Romania
- [Andreea D. ONA](#), UASVM Cluj-Napoca, Romania
- [Corina F. SERBAN](#), Washington State University, Stone Fruit Breeding & Genetics, IAREC, Prosser, WA 99350-8694, USA
- [Alina M. TRUȚĂ](#), UASVM Cluj-Napoca, Romania

## Linguistic Editors

- [Mihaela RUSU](#), UASVM Cluj-Napoca, Romania
- [Rodica STAN](#), UASVM Cluj-Napoca, Romania

## Journal Office

- [Roxana L. STOIAN-DOD](#), UASVM Cluj-Napoca, Romania
- [Silviu L. MIC](#), UASVM Cluj-Napoca, Romania

## Technical Support

- [Carla APARASCHIVE](#), UASVM Cluj-Napoca, Romania
- [Mihaela DINU-ROMAN SZABO](#), UASVM Cluj-Napoca, Romania
- [Adrian I. GEORGIU](#), UASVM Cluj-Napoca, Romania
- [Ioana L. GHIURCO](#), UASVM Cluj-Napoca, Romania
- [Iulia E. MORA](#), UASVM Cluj-Napoca, Romania
- [Diana Alexandra POP](#), UASVM Cluj-Napoca, Romania

## Notice

To be cited **Notulae Scientia Biologicae** or abbreviated title **Not Sci Biol**.

The Editorial Board of Not Sci Biol is not responsible for statements and opinions published; they represent the views of the authors or persons to whom they are credited. Publication of research information does not constitute a recommendation or endorsement of products involved.

## Aims and scope

[Notulae Scientia Biologicae](#) is a quarterly peer-reviewed journal aimed at disseminating significant research and original papers, critical reviews and short reviews on life sciences and medicine, development of new methodologies that can be of interest to a wide audience of scientists in all areas of biology sciences. The journal encourages authors to frame their research questions and discuss their results in terms of the major questions of biology, agriculture, horticulture, forestry, biotechnology and medicine, thereby maximizing the impact, spreading and value of their research. The papers must be of potential interest to a significant number of scientists and, if specific to a local situation, must be relevant to a wide body of knowledge in life and medical sciences. Articles should make a significant contribution to the advancement of knowledge or toward a better understanding of existing biological, agricultural and medical concepts. An international Editorial Board advises the journal. The total content of the journal may be used for educational, non-profit purposes without regard to copyright. The distribution of the material is encouraged with the condition that the authors and the source (Notulae Scientia Biologicae or Not Sci Biol) are mentioned.

## Submission

The journal offers to authors a fully web-enabled online submission, instructions for authors and review system available at <https://www.notulaebiologicae.ro>

Papers are published in English (British spelling) and the authors are fully responsible for the originality of their papers and for the correctness of their subject-matter, language and formal attributes. Authors whose mother tongue is not English are strongly urged to have their reviewed linguistically before submission.

Manuscripts submitted must be edited, for clarity and conformity purposes according to Author's guidelines, and must not have been previously published or simultaneously submitted elsewhere.

The papers can be submitted online by the "corresponding author" (the main author, or the person who takes responsibility for the integrity of the work as a whole, from submission to the published article). The submission process is described on the web site.

An Author Statement, available on the website, should be enclosed by "senior author" declaring that the paper has not been published anywhere else, permission to reproduce the material, authorship credit, contributors and creditors for the integrity of the work as a whole, to avoid the conflicts of interest and scientist fraud, and respecting the ethical principles of publishing, research and scientific rights.

## Publication Frequency

Quarterly (four issues per volume/year):

Issue 1: January-March

Issue 2: April-June

Issue 3: July-September

Issue 4: October-December

## Publication Ethics and Publication Malpractice Policy

The journal respects the publication ethics norms, based on internationally accepted best practice guidelines for journal editors, notably the Committee on Publication Ethics ([COPE](#)), the World Association of Medical Editors Ethics ([WAME](#)), the International Committee of Medical Journal Editors ([ICMJE](#)) and Consolidated Standards of Reporting Trials ([Consort](#)).

Editor-in-Chief  
Prof. dr. h.c. Radu E. SESTRĂȘ

**Table of Contents - Vol 17, No 3 (2025)**

CONTENT	Article number
<b>Editorial</b> Introduction pages, Notulae Scientia Biologicae 17(3), 2025 Radu E. SESTRAS	12761 <a href="#">PDF</a>
<b>Review articles</b> Enhancing plant productivity and sustainability under diverse plant-environment interactions Mehrdad ALIZADEH, Mohsen ABBOD, Fatemeh GRAILY MORADI, Reza HASSANPOUR, Dedat PRISMANTORO, Febri DONI, Zahra RANJBAR, Mahyar MOBASSERI, Ayub AZARYAN	12468 <a href="#">PDF</a>
The effects of superoxide dismutase, benzyl adenine, and salicylic acid on plant growth and development – A comprehensive review Mohammad Reza ASKARNEJAD, Ali SOLEYMANI, Mohamad Hesam SHAHRAJABIAN, Mohammad Hashem AZIZI	12632 <a href="#">PDF</a>
Repurposing pomegranate fruit wastes for nanobiotechnological applications in emerging circular bioeconomy Agbaje LATEEF, Aminat O. FAJINGBESI, Musibau A. AZEEZ, Zainab O. HAMMED	12683 <a href="#">PDF</a>
Bee-pollinator-plant connections: A review of wild bee diversity and plant associations in West Bengal, India Md. Abu Imran MALLICK, Samprita MISHRA	12227 <a href="#">PDF</a>
<b>Research article</b> Turmeric's protective effect on rats' prostate damage caused by aluminum Farouk BOUDOU, Amal BELAKREDAR, Ahmed RASHID, Layth J. MOHAMMED, Mohammed RASHEED, Malika BENDAHMANE-SALMI, Raad RASHEED	12593 <a href="#">PDF</a>
Impact of dental deafferentation on ingestive, aversive and histomorphometric behaviour in Wistar rats Alejandro A. GUTIÉRREZ-PATIÑO PAÚL, Jhames I. ORÉ-DE LA CRUZ, Antony C. GONZALES-ALVARADO, Gilmer TORRES-RAMOS, Sara CASTAÑEDA-SARMIENTO, Jessica M. ARIETA-MIRANDA, Vladimir SÁNCHEZ-CHÁVEZ-ARROYO	12563 <a href="#">PDF</a>
Ethanol extract of <i>Argyrea acuta</i> leaves attenuates NSAID-induced gastric inflammation in mice via antioxidant and immunomodulatory mechanisms Tran Thi Phuong NHUNG, Le Pham Tan QUOC, Tran Thi HIEN	12687 <a href="#">PDF</a>
DFT and molecular modelling reveal the mechanism of action of selected alkaloids as anti-colorectal cancer agents targeting topoisomerase II Hung DUC NGUYEN	12642 <a href="#">PDF</a>
Harnessing aquatic weeds for SARS-CoV-2 antiviral activity: A combined molecular docking and vero cell line study Kuntal DAS, Paramita DAS	12571 <a href="#">PDF</a>

- Anti-inflammatory and antioxidant activity of *Rubus idaeus* shoot extract: An in silico molecular docking study  
Olexander MASLOV, Mykola KOMISARENKO, Daryna Horopashna, Lyudmyla DERYMEDVID, Sergii KOLISNYK, Svetlana KARPUSHINA 12463 [PDF](#)
- Chitosan microparticles with *Yucca baccata* Torr. extract: antibacterial and antibiofilm activity against *Salmonella Typhimurium*  
Ildefonso GUERRERO-ENCINAS, Javier N. GONZÁLEZ-GONZÁLEZ, Jesús F. AYALA-ZAVALA, Ana I. LEDESMA-OSUNA, Marco A. LÓPEZ-MATA, Gustavo A. GONZÁLEZ-AGUILAR, Rosalva PÉREZ-MORALES, Luis QUIHUI-COTA 12587 [PDF](#)
- Green synthesis of metal nanoparticles using leaf extracts of *Mammea americana* L. (Calophyllaceae) and its efficacy against vector mosquito larvae and non-target organisms  
Jayeeta KHANRAH, Anjali RAWANI 12621 [PDF](#)
- Phytochemical screening and evaluation of antioxidant and antibacterial activities of leaf extracts of the Moroccan medicinal plant *Warionia saharae*  
Mammass BOURASSEN, Rachid BOUHARROUD, Redouan QESSAOUI, Mouna BELMOUDEN, Fatima Zahra ABOULFARAH, M'barka ELQDHY, Mohammed HASSI, Mohamed ALOUANI 12472 [PDF](#)
- Bioactive potential of *Origanum elongatum* extracts: Focus on phytochemical composition and antioxidant properties of different fractions  
Oumaima HMIDOUICHE, Khadija BOUFTINI, Ibtissam SABIR, Mariama LASKY, Abderrahmane MRICHA, Halima RCHID, Rachid NMILA 12417 [PDF](#)
- Evaluation of chemical composition, antioxidant capacity, and antibacterial activity of essential oil from aerial parts of basil (*Ocimum basilicum* L.) in Yen Bai province, Vietnam  
Pham My HAO, Le Pham Tan QUOC 12456 [PDF](#)
- Chemical characterization and multifunctional bioactivities of red kidney bean (*Phaseolus vulgaris* L.)  
Thamer AL-KHUZAIM, Hossam S. EL-BELTAGI, Hend ABDELGALIL, Hefnawy TAHA, Wael SHEHATA, Mohamed F. ABO EL-MAATI, Adel A. REZK, Ali OSMAN 12697 [PDF](#)
- Effect of algae extracts of *Sargassum* genus on the germination and growth of lettuce (*Lactuca sativa* L.) and radish (*Raphanus sativus* L.)  
Bouchra AL AISSAOUI, Ibtissam SABIR, Oumaima HMIDOUICHE, Ismail ESSAAID, Mariama LASKY, Abderrahmane MRICHA, Halima RCHID, Rachid NMILA 12474 [PDF](#)
- Somatic embryogenesis from stem and leaf explants of Sanchi ginseng (*Panax notoginseng*) and genetic stability assessment of regenerated plantlets using SCoT markers  
Vy Thuy Huynh DANG, Yen Phi TRUONG, Huong Cam Thi CAO, Phong Vu NGUYEN 12439 [PDF](#)
- Constructing metabolic pathways for biogas production at low temperatures through metagenomic and metatranscriptomic analyses  
BUDIANTO, Diah KUSMARDINI, Krysna MURTY, NURFADHILAH, Gito Tri Putra ISWANDI 12374 [PDF](#)
- Integrating morpho-physiological and biochemical traits to assess drought stress and recovery tolerance in eggplant  
Abdelghani CHAKHCHAR, Meriem AITOUGUINANE, Kholoud AFALO, Ahmed BOUTABAA, Romaisaa EL BOUHI, Maria AIT ZIDAN, Amina CHABBAR, Cherkaoui EL MODAFAR 12427 [PDF](#)
- Euonymo nanae-Quercetum roboris* Pinzaru, Sfeclă & Cantemir – ass. nova in the Republic of Moldova  
Pavel PÎNZARU, Victor SFECLĂ, Valentina CANTEMIR 12631 [PDF](#)

**Note**

Stepwise studies in plant biotechnology

José Carlos LORENZO, Oscar VICENTE

12746

PDF

\*\*\*

## Journal Contact

Mailing Address

**[Notulae Scientia Biologicae](#)**

Radu E. SESTRAS, Editor-in-Chief

**Society of Land Measurements and Cadastre from Transylvania - SMTCT**

134 Donath Street, 400293

Cluj-Napoca, Romania

Email: [rsestras@notulaebiologicae.ro](mailto:rsestras@notulaebiologicae.ro)

## Technical Support Contact

Email: [editor1@notulaebiologicae.ro](mailto:editor1@notulaebiologicae.ro)

## Publisher

- [Society of Land Measurements and Cadastre from Transylvania \(SMTCT\)](#)

## Journal Sponsorship: Societies/Institutions

- [Society of Land Measurements and Cadastre from Transylvania \(SMTCT\)](#)
- [Horticulture and Forestry Society from Transylvania \(SHST\)](#)
- [University of Agricultural Sciences and Veterinary Medicine \(UASVM\)](#)

## Sources of Support

**Additional agencies or organizations that provide financial or in-kind support:**

SC TOPOCAD





Electronic ISSN 2067-3264  
[www.notulaebiologicae.ro](http://www.notulaebiologicae.ro)