

---

# Revue Nature et Technologie

---

Revue académique à diffusion internationale

---



**Volume 14**

**Numéro 02 – Juin 2022**





## Presentation

“Nature and Technology Review” (NATEC) is a multidisciplinary scientific journal published by Hassiba Benbouali University of Chlef (Algeria) since June 2009. NATEC publishes, in English and French, original research articles and review articles, which cover a wide spectrum of theoretical and experimental work at universities and other national, regional and international research organizations.

The fields covered by NATEC are divided into 3 categories:

- Category A: Fundamental Sciences and Engineering
- Category B: Agronomic and Biological Sciences
- Category C: Environmental Sciences.

NATEC adheres to the ethical guidelines for research and publication of [COPE](#) as described in [Guidelines on Good Publication](#).

NATEC has an international reviewing committee and senior researchers with established competence in their fields.

The submission is exclusively via electronic way through the Algerian Scientific Journal Platform (ASJP): <https://www.asjp.cerist.dz/en/PresentationRevue/47>

All articles submitted to NATEC are subject to a rigorous double-blind peer-to-peer review by at least two referees in the field of the submitted work.

What is considered in the evaluation are originality; accuracy; reproducibility; validity and language.

Possible decisions reserved for an article include acceptance, revision or rejection. If an author is encouraged to revise his or her article, there is no guarantee that the revised version will be published. The decision to reject an article is final.

During the entire evaluation process, the Editorial Board guarantees the anonymity of the referees and authors. Articles are submitted to the experts anonymously. The evaluation sheets sent to the authors are also anonymous.

All members of the Reviewing Committee and Editorial Board are under the obligation of confidentiality of the articles. They are strictly forbidden to divulge the content, in whole or in part, even the abstract, of articles under review by the journal. This prohibition remains valid even for articles that have been definitively rejected.

The submission, evaluation and publication of accepted articles are totally free. The publication is in Open Access under the terms of the BY license of [Creative Commons Attributions 4.0 International](#) which allows to share, copy, reproduce, distribute, communicate, reuse or adapt the published work with the obligation to credit its author.

Acceptance of the manuscript is limited by the legal requirements that will be in effect at the time regarding law, copyright infringement and plagiarism.

"Nature and Technology Journal" is indexed in the following databases: [ASJP](#) ; [ProQuest](#) ; [EBSCO](#) ; [Worlcat](#) ; [Index Copnicus](#) ; [ResearchBib](#) ; [DRJI](#) ; [SJIF](#) ; [MIAR](#) ; [WebReview](#) ; [GIF](#) ; [CiteFactor](#) ; [DFAJ](#) ; [ACNP](#) et [Mirabel](#).

## Committees

**Honorary Director:**

**Pr. GUERINE Lakhdar**

**Publication Director:**

**Pr. HASSANI Hocine**

**Editor-in-Chief:**

**Dr. HDR. ZIDANE Azdinia** Laboratory of Natural Bio-Resources, Department of Biology, Faculty of Nature and Life Sciences, University Hassiba Benbouali of Chlef (Algeria)

### Editorial Committee

**Dr. TAHRAOUI Mohamed Amine**

*Department of Computer sciences, University Hassiba Benbouali of Chlef, Algeria*

**Dr. TAHRAOUI-DOUMA Naima**

*Process engineering sciences, University Hassiba Benbouali of Chlef, Algeria*

**Dr. GADOUCHE Leila**

*Department of Biology & Physiology of Organisms, Faculty of Biological Sciences, USTHB, Algiers, Algeria.*

**Dr. METLEF Sara**

*Laboratory of Local Natural Bioresources. Faculty of Agronomic and Biological Sciences, University Hassiba Benbouali of Chlef, Algeria*

### Associated Editors:

**Dr. ALLIOUCHE Faiza**

*Laboratory of Formulation and Manufacture of Artificial Foods for Farmed Fish, CNRDPA, Bou Ismaïl, Tipaza, Algeria*

**ARAB Karim**

*Department of Biology University M'Hamed Bougara of Boumerdes, Algeria*

**Pr. BAKOUR Rabah**

*University of Science and Technology Houari Boumediene, Algeria*

**Pr. BEKRO Yves-Alain**

*University of Abobo-Adjamé, Abidjan, Ivory Coast*

**Pr. BELAKEHAL Azeddine**

*Mohamed Khider University of Biskra, Algeria*

**Pr. BEREZOWSKA-AZZAG Ewa**

*Polytechnic School of Architecture and Urbanism EPAU Algiers, Algeria*

**Pr. BOUKALA IOUALALEN Malika**

*University of Science and Technology Houari Boumediene, Algiers, Algeria*

**Pr. GHOUL Said**

*Philadelphia University, Aman, Jordan*

**Pr. HACENE Hocine**

*University of Science and Technology Houari Boumediene, Algiers, Algeria*

**Pr. HAMRAT Mostefa**

*Hassiba Benbouali University of Chlef, Algeria*

**Pr. HARTANI Tarik**

*Morsli Abdellah University Center of Tipaza, Algeria*

**Pr. KHELIDJ Abdelhafid**

*University of Nantes, Nantes, France*

**Pr. LACHI Mohammed**

*GRESPI, Reims, France*

**Pr. MERAGHNI Fodil**

*Ecole Nationale Supérieure d'Arts et Métiers, Paris, France*

**Pr. M'SADAK Youcef**

*ISA, Chot Meriem, Sousse Tunisia*

**Pr. OUALIDA Rached**

*National School of Biotechnology, Constantine, Algeria*

**Pr. OULD CHIKH El bahri**

*Mustapha Stambouli University of Mascara, Algeria*

**Pr. Paola Ferrazzi**

*Department of Agricultural, Forestry and Food Sciences, University of Torino, Italy*

**Pr. RAHAL Farid**

*Department of Civil Engineering, Mohamed Boudiaf University of Oran, Algeria*

**Pr. SRAIRI Mohamed Taher**

*Hassan II Agronomic and Veterinary Institute, Morocco*

**Pr. TAKY Mohamed**

*Department of Chemistry, Faculty of Science, Ibn Tofail University, Kenitra, Morocco*

**Pr. YAHIAOUI Karima**

*Department of Nature and Life Sciences – Univ. M. Bouguerra of Boumerdes, Algeria*

**Pr. YAOVI Ameyapoh**

*Higher School of Biological and Food Techniques, University of Lomé, Togo*

**Pr. ZEMMOURI Noureddine**

*Mohamed Khider University of Biskra, Algeria*

### Secretary:

Mr. MAHMOUD Benaouda; [b.mahmoud@univ-chlef.dz](mailto:b.mahmoud@univ-chlef.dz); Mobil: +(213) 671862766

Ms. RIATI Sabrina; [s.riati@univ-chlef.dz](mailto:s.riati@univ-chlef.dz)

### Address:

Revue Nature et Technologie, Direction des publications, Pôle universitaire Ouled-Fares, 4<sup>e</sup> étage (Rectorat) 02180, Chlef – Algeria.

# Summary

Vol. 14 - Issue n° 2 - June 2022  
Nature & Technology Journal



Revue  
Nature et Technologie

<http://www.univ-chlef.dz/revuenatec>  
ISSN: 1112-9778 – E-ISSN: 2437-0312

## Class A: Fundamental & Engineering Sciences

### *Production de bioéthanol à partir de jus d'orange de Rouïba* ..... 01

Samira ELBEY, Abderrahmane OUAKIL et Fatma Zohra ZOUBIRI, Rachida RIHANI, Fatiha BENTAHAR  
Laboratoire Phénomènes de transfert, Faculté de Génie Mécanique et Génie des Procédés. Université des Sciences et de la Technologie Houari Boumediene (USTHB). Bab-Ezzouar, BP 32 El Alia 16111 Alger, Algérie

## Class B: Agronomic & Biological Sciences

### *Évaluation des caractéristiques physico-chimiques, Microbiologiques et sensorielles du concentré de tomate enrichi par l'huile d'olive vierge* ..... 08

Djilali BOUHADI<sup>a</sup>, Ahmed HARIRI<sup>a</sup>, Zouaoui BENATTOUCHE<sup>a</sup>, Fatima SAHNOUNI<sup>b</sup>, Nebia BOUZIDI<sup>c</sup>, Hamza BELKHODJA<sup>a</sup>  
<sup>a</sup> Laboratoire de Bioconversion, Génie Microbiologie et Sécurité Sanitaire, Université de Mascara, BP. 763, Sidi Saïd, 29000, Algérie.  
<sup>b</sup> Université de Mascara- BP. 763, Sidi Saïd, 29000, Algérie.  
<sup>c</sup> Laboratoire de recherche sur le Géo-environnement et le développement. Université de Mascara- BP. 763, Sidi Saïd, 29000, Algérie.

### *Mise à jour des connaissances sur la traite robotisée des vaches laitières (Review)* ..... 18

Maha YOUSFI<sup>a,b</sup> et Youssef M'SADAK<sup>a</sup>  
<sup>a</sup> Université de Sousse, Institut Supérieur Agronomique de Chott Mariem, B.P. N°47, Sousse 4042, Tunisie  
<sup>b</sup> Université Hongroise d'Agriculture et des Sciences de la Vie, Campus de Kaposvár, Guba Sándor u.40, Kaposvár 7400, Hongrie

### *Évaluation de la qualité physico chimique d'un jus de fruit soumis à quelques traitements thermiques durant sa conservation* ..... 33

Sara METLEF<sup>a</sup>, Azdinia ZIDANE<sup>b</sup> et Leila GADOUCHE  
<sup>a</sup> Laboratoire Bioressources Naturelles, Département des Sciences Alimentaires et Nutrition Humaine, Faculté des Sciences de la Nature et de la Vie, Université Hassiba Benbouali, Chlef 02000, Algérie.  
<sup>b</sup> Laboratoire Bioressources Naturelles, Département de Biologie, Faculté des Sciences de la Nature et de la Vie, Université Hassiba Benbouali, Chlef 02000, Algérie.  
<sup>c</sup> Laboratoire Bio-Ressources Naturelles, Université des Sciences et Technologie Houari Boumediene (USTHB), Faculté des Sciences Biologiques, département de Biologie et physiologie des organismes, Bab Ezzouar Alger, Algérie.

## Class C: Environmental Sciences

### *Caractérisation d'un périmètre de reboisement de pinède en vue de proposition des essences les plus appropriées, cas du Jbel Zemzem (Nord-ouest, Maroc)* ..... 42

Mariam BEN-SAÏD<sup>a</sup>, Abdelilah GHALLAB<sup>b</sup>, Farida BERRAD<sup>b</sup>, Abdallah AOUADI<sup>c</sup>, Fadoua ASRAOUT<sup>a</sup>, Majida EL ALAMI EL MOUTAOUAKIL<sup>d</sup>  
<sup>a</sup> Laboratoire Biologie Appliquée et Pathologie, Département de Biologie, Faculté des Sciences, Université Abdelmalek Essaâdi, B.P 93002, Tétouan, Maroc.  
<sup>b</sup> Direction Régionale des Eaux et Forêts et de la Lutte Contre la Désertification du Rif, B.P 93000, Tétouan, Maroc.  
<sup>c</sup> Département d'Écologie, Université 8 Mai 1945 Guelma, BP 4010, Guelma 24000, Algérie.  
<sup>d</sup> Département de Biologie, Faculté des Sciences, Université Abdelmalek Essaâdi, B.P 93002, Tétouan, Maroc

### *Diversité des services écosystémiques et utilisation des terres dans le paysage du socle Eburnéen au Togo* ..... 61

Fousseni FOLEGA, Komla Efiou DATCHE-DANHA, Abdel akim FOLEGA, Agbelessi Yao WOEGAN, Kperkouma WALA, Koffi AKPAGANA  
Géomatique et Modélisation des Ecosystèmes (GME), Laboratoire de botanique et écologie végétale (LBEV), Faculté des Sciences, Université de Lomé, TOGO