Current Journal of Applied Science and Technology

Editorial Policy

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Current Journal of Applied Science and Technology is a peer reviewed international scientific journal dedicated to publish research papers, reviews, case studies and short communications from all disciplines of science and technology. By not excluding papers on the basis of subject area, CJAST facilitates the research and wishes to publish papers as long as they are technically correct and scientifically motivated. Subject areas cover, but not limited to, medicine, physics, chemistry, biology, environmental sciences, geology, engineering, agriculture, biotechnology, nanotechnology, arts, education, sociology and psychology, business and economics, finance, mathematics and statistics, computer science, social sciences, linguistics, architecture, industrial and all other science and engineering disciplines.

Current Journal of Applied Science and Technology will have 36 issues per year. Each issue will be running issue and all officially accepted manuscripts will be immediately published online. State-of-the-art running issue concept gives authors the benefit of 'Zero Waiting Time' for the officially accepted manuscripts to be published. This journal is an international journal and scope is not confined by boundary of any country or region.

Disclaimer: As per the recommendation of different reputed indexing organizations and following the requests of researchers and editors, title of this journal has been changed. ‘British Journal of Applied Science & Technology’ continued as ‘Current Journal of Applied Science and Technology'. This international journal has no connection with any scholarly society or association or any specific geographic location or any country (like USA, UK, Germany, etc). This is an independent journal run by SCIENCEDOMAIN international. Legal contact address of editorial office and other offices are available in this link (http://www.journalcjast.com/index.php/CJAST/about/contact).

GENERAL EDITORIAL POLICY

Publication Criteria

1. The study has not been published (partly or as a whole) before or is not under consideration for publication elsewhere (except as an abstract or as part of a published lecture or academic thesis); We will consider manuscripts that have been deposited in preprint servers such as arXiv or published in institutional repositories. We will also consider work that has been presented at conferences (Significant amount of changes should be made before submission to the journal and proper citation of the conference paper is required). Submission of a manuscript clearly indicates that authors grant a license to publish the article and identify itself as the original publisher. The submitting author (corresponding author) is responsible for ensuring that the article's publication has been approved by all the other coauthors and after the publication of the paper author-dispute related issues will not be entertained. It is also the corresponding authors' responsibility to ensure that the articles emanating from a particular institution are submitted with the approval of the necessary institution.

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5. If a submitted study replicates or is very similar to previous work, authors must provide a sound scientific rationale for the submitted work and clearly reference and discuss the existing literature. Submissions that replicate or are derivative of existing work will likely be rejected if authors do not provide adequate justification.

6. English quality: The language in submitted articles must be clear, correct, and unambiguous. It is author's responsibility to a improve the English quality (if required) by any other third party service.

7. The research must meet all applicable standards for the ethics of experimentation and research integrity.

8. This publisher believes that no manuscript should be rejected only on the basis of ‘lack of Novelty’, provided the manuscript is sufficiently robust and technically sound. Too often a journal's decision to publish a paper is dominated by what the Editor/reviewer think is interesting and will gain greater readership — both of which are subjective judgments and lead to decisions which are frustrating and delay the publication. The journals will rigorously peer-review your submissions and publish all papers that are judged to be technically sound. Judgments about the importance of any particular paper are then made after publication by the readership (who are the most qualified to determine what is of interest to them).

ONLINE publication model and Reprints

We strongly encourage "ONLINE" publication model. But we also understand that "Reprints" are required by some authors. Reprints may be used to display the potential of the article at interviews, conferences, distribution to colleagues, seminars, other promotional activities, etc. Therefore, if required, reprints can

be ordered here (Link). 'Reprint Charge' (RC) is separate from Article Processing Charge (APC) or Publication Charge.

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Peer Review Mechanism

(Up to 6th August 2012, all journals followed strict double blindfold review policy to ensure neutral evaluation. During this review process identity of both the authors and reviewers are kept hidden to ensure an unbiased evaluation.)

Advanced OPEN peer review:

We have migrated to transparent and toughest ‘Advanced OPEN peer review’ system (Detailed general information is available in this link). High-quality manuscripts are peer-reviewed by minimum two peers in the same field. OPEN peer review system provides the provision to reveal the identities of the authors and reviewers to each other during the review process. In order to add transparency further, details of all reviewers and academic editors are published in the first page of every published paper (in the Article Information section: see example). As a final step to provide highest level transparency in the process, all review comments, authors' feedbacks, all versions of the manuscript and editorial comments are published (along with date) with the paper in 'Review History' link (See example 1, example 2, example 3, etc). This transparent process will help to eradicate any possible malicious/purposeful interference by any person (publishing staff, reviewer, editor, author, etc) during peer review. As a result of this unique system, all reviewers will get their due recognition and respect, once their names are published in the papers (Example Link). If reviewers do not want to reveal their identities, we will honour that request. In that case, only the review reports will be published as ‘anonymous reviewer report’.

Additionally ‘Advanced OPEN peer review’ greatly helps in ‘continuity and advancement of science’. We strongly believe that all the files related to peer review of a manuscript are valuable and hold an important place in the continuity and advancement of science. If publishers publish the peer review reports along with published papers, this process can result in savings of thousands of hours of future authors during experiments, manuscript preparation, etc. by minimizing the common errors after reading these previously published peer review reports. Therefore, as per our new official policy update, if the manuscript is published, all peer review reports will be available to the readers. All files (like the original manuscript, comments of the reviewers, revised manuscript, and editorial comment (if any)) related to the peer review, will be available in “Review history” link along with the published paper (Example Link).

Additionally, we believe that one of the main objectives of peer review system is ‘to improve the quality of a candidate manuscript’. Normally we try to publish the ‘average marks (out of 10)’ a manuscript received at initial peer review stage and at final publication stage to record its history of improvement during peer

review. This process further increases the transparency. It is more important to record honestly the ‘strength and weakness of a manuscript’ than claiming that 'our peer review system is perfect’. Therefore, these transparent processes (i.e. publication of review history files and scores of a particular manuscript) additionally give a clear idea of the strength and weakness of a published paper to the readers, which enhances the chances of proper use of the result of a research (and or reduces the chances of misuse of the weakness of the findings of the paper). Thus this transparent process may prove to be highly beneficial for the society in long run.

We strongly discourage any attempt by the authors to contact the reviewer directly to influence the review process. We also strongly discourage any attempt by the reviewers to contact the authors directly. General guidelines for Peer-review Process are available below.

Reviewer suggestion

It is a prerequisite to submit, with the manuscript, the names, addresses and e-mail addresses of 4 potential reviewers (When suggesting peer reviewers, please follow these guidelines to avoid any probable conflict of interest. Suggested reviewers should not: i) be from the same department or division as one of the authors (the same university, state, country should also be avoided); ii) have been a research guide or student of one of the authors within the past 10 years; iii) have collaborated with one of the authors within the past 10 years; iv) be employees of non-academic organizations with which one of the authors has collaborated within the past 10 years). It is the sole right of the editorial team to decide whether suggested reviewers to be used or not.

Reviewer selection

Reviewer selection is a critical parameter to maintain the high peer review standard of any journal. Many factors are considered during peer reviewer selection like: proof of expertise in terms of published papers in the same area in reputed journals, affiliation, and reputation, specific suggestion, etc. We try to avoid reviewers who are slow, careless or do not provide sufficient justification for their decision (positive or negative). Authors can also identify peers that they want not to review their paper. As far as possible, the editorial team respects requests by authors to exclude reviewers whom they consider to be unsuitable. We also, as much as possible, try to rule out those reviewers who may have an obvious competing interest.

The main force behind our fast, efficient and quality Peer review system is the tremendous hard work of our Peer Reviewers & Editors. We are extremely grateful to the peer reviewers and editors for their great service.A combined list of contributing Peer Reviewers for all journals is published on our official website. From 2012 we have migrated to OPEN peer review system and after the migration, we have stopped updating this list.

Review process flow

The reviewers’ comments are generally sent to authors within 3 weeks after submission. With the help of the reviewers’ comments, FINAL decision (accepted or accepted with minor revision or accepted with major revision or rejected) will be sent to the corresponding author. Reviewers are asked if they would like to review a revised version of the manuscript. The editorial office may request a re-review regardless of a reviewer's response in order to ensure a thorough and fair evaluation. Reviewers who may have offered an opinion not in accordance with the FINAL decision should not feel that their recommendation was not duly considered and their service not properly appreciated. Experts often disagree, and it is the job of the editorial team to make a FINAL decision.

Authors are encouraged to submit the revised manuscript within 7-15 days of receipt of reviewer's comment (in case of minor corrections). But at any case, the revised manuscript submission should not go beyond 8 weeks (only for the cases of major revision which involves additional experiment, analysis etc.), in order to maintain this journal's mission of the fast publication. Along with corrected manuscript authors need to submit filled 'review comment form', any rebuttal to any point raised by reviewers. The Editor of the journal will have exclusive power to take the final decision regarding acceptance or rejection of a manuscript during peer review process.

One of the main policies of this journal is 'fast spreading of scientific findings' by publishing suitable manuscripts within 6 weeks after submission (except some abnormal cases). Under special circumstance, if the review process takes more time, author(s) will be informed accordingly. The editorial board or referees may re-review manuscripts that are accepted pending revision. Manuscripts with latest and significant findings will be handled with the highest priority so that it could be published within a very short time. The journal is determined to promote integrity in research publication. In case of any suspected misconduct, journal management will reserve the right to re-review any manuscript at any stages before final publication.

General guidelines for Peer Review Process

• This journal strongly opposes the practice of duplicate publication or any type of plagiarism. If you suspect any unethical practice in this manuscript, kindly write it in the report with some proof/web links.
• Studies which are carried out to reconfirm / replicate the results of any previously published paper with new data-set, may be considered for publication. But these types of studies should have a 'clear declaration' of this matter.
• This publisher believes that no manuscript should be rejected only on the basis of 'lack of Novelty', provided the manuscript is sufficiently robust and technically sound. Too often a journal's decision to publish a paper is dominated by what the Editor/reviewer think is interesting and will gain greater readership — both of which are subjective judgments and lead to decisions which are frustrating and delay the publication. The journals will rigorously peer-review your submissions and publish all papers that are judged to be technically sound. Judgments about the importance of any particular paper are then made after publication by the readership (who are the most qualified to determine what is of interest to them).
• Materials & methods (Kindly comment on the suitability and technical standards of the methods. Sufficient details of the methods/process should be provided so that another researcher is able to reproduce the experiments described)
• Results & discussion (Kindly comment on: 1. Are the data well controlled and robust? 2. Authors should provide relevant and current references during discussion. 3. Discussion and conclusions should be based on actual facts and figures. Biased claims should be pointed out. 4. Are statistical analyses must for this paper? If yes, have sufficient and appropriate statistical analyses been carried out?)
• Conclusion (Is the conclusion supported by the data, discussed inside the manuscript? Conclusions should not be biased and should be based on the data, presented inside the manuscript only. Authors should provide adequate proof for their claims without overselling them)
• Are all the references cited relevant and adequate? Are there any other suitable current references authors need to cite?
• This publisher believes in constructive criticism. Reviewers are encouraged to be honest but not offensive in their language (Unnecessarily harsh words may be modified or removed at the editors' discretion). It is expected that the reviewers should suggest the authors on how they can strengthen their paper to make it acceptable. Comments of the reviewers should be sufficiently informative and helpful to reach a Editorial Decision. We strongly advise that a negative review should also explain the weaknesses of any manuscript, so that the concerned authors can understand the basis of rejection and he/she can improve the manuscript based on those comments. Authors also should not confuse straightforward and

true comments with unfair criticism.
• We are very much reluctant to go against suggestions (particularly on technical areas) of the reviewers. Therefore, authors are requested to treat the suggestions of reviewers with utmost importance.

• Appeal: Rejected papers are given the opportunity for a formal appeal. Appeal requests should be made in writing, not by telephone, and should be addressed to contact@sciencedomain.org with the word "appeal" in the subject line. If an author remains unsatisfied, he or she can write to the Editorial Office, citing the manuscript reference number. In all these cases, it is likely that some time will elapse before journal can respond, and the paper must not be submitted for publication elsewhere during this time. Authors should provide detailed reasons for the appeal and point-by-point responses to the reviewers' and/or Academic Editor's comments. Authors should also be aware that priority is given to new submissions to the journal and so the processing of the appeal may well take longer than the processing of the original submission. If an appeal is rejected, further appeals of the decision will not be considered and the paper may not be resubmitted.

Post-publication peer review:

1. Journal Web sites provide the ability for users to comment on articles to facilitate community evaluation and discourse around published articles. The comment section is mainly dedicated to promote "Post-publication peer review". Therefore, all journals strictly follow 'pre-publication OPEN peer review' and strongly encourage "Post-publication peer review". As a result of this "Post-publication peer review", if authors agree and or journal Editors agree (and or journal agrees) that any correction is necessary, then it will be published FREE of cost by following Correction and retraction policy (http://www.journalcjast.com/index.php/CJAST/correction-and-retraction-policy).

2. Users, who want to comment, are encouraged to register on website. But if anybody doesn’t want to register, we'll respect the decision. In order to honour 'free flow of thoughts' unregistered user are also welcome to comment. Social login is also encouraged.

3. At the end of every comment, the user must identify himself/herself by providing the following information 1. Full Name 2. Name of the Department, University, institute, etc. (This two information will be displayed publicly). We don't like 'anonymous' comments. Comments with 'forged identity' will be deleted.

Note: Users must see and agree to our complete Comment Policy

Plagiarism Policy

This journal strongly opposes the practice of duplicate publication or any type of plagiarism.

This journal aims to publish original high-quality research work. Submission of a manuscript to this journal indicates that the study has not been published anywhere or not been submitted elsewhere for publication. If author(s) are using any part of a published paper (in English or any other language), they should give a proper reference or in any case, if required they should get permission from the previous publisher or copyright holder (whichever is suitable).

Plagiarized manuscripts would not be considered for publication. If plagiarism is found in any published paper after an internal investigation, a letter would be immediately sent to all the authors, their affiliated institutes and funding agency, if applied and subsequently the paper will be retracted.

Plagiarism policy of this journal is mainly inspired by the plagiarism policy of The Nature. Plagiarism policy of this journal is described below:

1. Plagiarism is when an author attempts to pass off someone else's work as his or her own. This journal also adopted IEEE definition of plagiarism to deal such cases. It defines plagiarism as "the reuse of someone else's prior ideas, processes, results, or words without explicitly acknowledging the original author and source."

2. Plagiarism can be said to have clearly occurred when large chunks of text have been cut-and-pasted. Such manuscripts would not be considered for publication in this journal. Papers with confirmed plagiarisms are rejected immediately.

3. But minor plagiarism without dishonest intent is relatively frequent, for example, when an author reuses parts of an introduction from an earlier paper.

4. Duplicate publication, sometimes called self-plagiarism, occurs when an author reuses substantial parts of his or her own published work without providing the appropriate references. This can range from getting an identical paper published in multiple journals, to 'salami-slicing', where authors add small amounts of new data to a previous paper. Self-plagiarism, also referred to as 'text recycling', is a topical issue and is currently generating much discussion among editors. Opinions are divided as to how much text overlap with an author's own previous publications is acceptable. We normally follow the guidelines given in COPE website. Editors, reviewers, and authors are also requested to strictly follow this excellent guideline (Reference: Text Recycling Guidelines: http://publicationethics.org/text-recycling-guidelines).

5. In case of 'suspected minor plagiarism', authors are contacted for clarification. Depending on all these reports, reviewers and editors decide final fate of the manuscript. If the manuscript is finally accepted and published, then to maintain transparency, all these reports are published in 'publication history' of the paper by following Advanced OPEN peer review system. The journal editors judge any case of which they become aware (either by their own knowledge of and reading about the literature, or when alerted by referees) on its own merits.

6. Use of the automated software is helpful to detect the 'copy-paste' problem. All submitted manuscripts are checked by the help of different databases, eTBLAST, Plagiarism Detection tools, etc. At the same time scientific implication of the case ('suspected minor plagiarism'), also judged by reviewers and editors. Plagiarism Detection tools are useful, but they should be used in tandem with human judgment and discretion for the final conclusion. Therefore, suspected cases of plagiarisms are judged by editors on 'case-to-case basis'.

7. Editors have the final decision power for these cases.

Some useful information is available at the following links:

1. http://www3.imperial.ac.uk/library/researchers/plagiarismdetection

2. http://www.nature.com/authors/policies/plagiarism.html

3. http://www.artjohnson.umd.edu/bioe/Threshold-for-Plagiarism.pdf

4. http://www.zju.edu.cn/jzus/download/editorpapers/SCIMsurvey.pdf

5. http://en.wikipedia.org/wiki/Plagiarism_detection

6. The Complete Guide to Referencing & Avoiding Plagiarism

7. CrossCheck Plagiarism Screening: What's the Magic Number?

Correction and retraction policy

To know about this journal correction and retraction policy, click here (http://www.journalcjast.com/index.php/CJAST/correction-and-retraction-policy).

To know about this journal representative guideline for authorship dispute, kindly click here (https://drive.google.com/file/d/1zLRYoSPmm4OrVFvSBkF99oqMV1NEx_Xr/view?usp=sharing).

This journal is determined to promote integrity in research publication. We have great respect and we generally follow the guidelines, given by COMMITTEE ON PUBLICATION ETHICS (COPE) for any publication disputes, authorship disputes, etc. For these kinds of disputes, we generally visit and follow the COPE website and author(s) are also requested to do so. Excellent guidelines, related to COPE's Code of Conduct and its advice to tackle cases of suspected misconduct, are available in this link (http://publicationethics.org/resources/flowcharts). All the materials available in COPE website are the copyright of COPE.

Portability of Peer-review

In order to support efficient and thorough peer review, this journal aims to reduce the number of times a manuscript is reviewed after rejection from any journal, thereby speeding up the publication process and reducing the burden on peer reviewers. Request from the author for 'transfer of manuscript' from one journal to another journal, also may be accommodated under this policy. Under the above-mentioned cases, by following 'portability of peer-review' policy, publisher will pass the review comments of a particular manuscript to the editor of another journal at the authors' request. We will reveal the reviewers' names to the handling editor for editorial purposes unless reviewers let us know when they return their report that they do not wish us to share their report with another published journal and/or that they do not wish to participate further in the peer review of this manuscript.

Special note for authors:

As a part of restructuring all journals, we are closing all the manuscripts, where manuscripts are pending dormant for more than 4 weeks after the final acceptance mail. Due to the restructuring of our editorial policy and regulations, we have closed all the files of these types of manuscripts. Files of these types of manuscripts can be kept alive if authors agree for a fresh round of peer review by at least two peer reviewers or re-approved by the present editorial board.

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India
Guest House Road, Street no - 1/6,
Hooghly, West Bengal, India
Corp. Firm Registration Number: L77527
Email: contact@journalcjast.com
Tele: +91 8617752708
WhatsApp: +91 8617752708
(Headquarters)

UK
Third Floor, 207 Regent Street
London, W1B 3HH, UK
Email: contact@journalcjast.com
Fax: +44 20-3031-1429
(Branch office)

Publisher
Ms. M. B. Mondal, Ph.D.
Email: director@sciencedomain.org

Principal Contact

Current Journal of Applied Science and Technology
contact@journalcjast.com (mailto:contact@journalcjast.com)

Support Contact

Current Journal of Applied Science and Technology
contact@journalcjast.com (mailto:contact@journalcjast.com)

Editorial Team

Chief Editors

Academic Editors

Dr. Nan Wu

Associate Professor,

Department of Mechanical Engineering,
University of Manitoba, Winnipeg, Canada
Email: nan.wu@umanitoba.ca
Profile link: https://goo.gl/QgaaPD (https://goo.gl/QgaaPD)

Dr. Rodolfo Dufo Lopez

Professor,

Department of Electrical Engineering, University of Zaragoza, Spain

Email: rdufo@unizar.es

Profile link: NA

Dr. Diyuan Li

Professor,

School of Resources and Safety Engineering, Central South University, China

Email: diyuan.li@csu.edu.cn

Profile link: NA

Dr. Chien-Jen Wang

Professor,

Department of Electrical Engineering, National University of Tainan, Taiwan

Email: cjwang@mail.nutn.edu.tw

Profile link: NA

Dr. Teresa De Pilli

Assistant Professor,

Department of Science of Agriculture of Food of Environment (SAFE),

University of Foggia, Via Napoli, Italy

Email: t.depilli@unifg.it, teresadepilli@tiscali.it

Profile link: NA

Dr. Jerzy Nowacki

Professor,

Faculty of Mechanical Engineering And Mechatronics

Professor,

China University of Petroleum, China

Email: cysun@cup.edu.cn

Profile link: NA

Dr. Ahmed Mohamed El-Waziry

Professor,

King Saud University, College of Food and Agriculture Sciences, Kingdom of Saudi Arabia

Email: aelwaziry@yahoo.com

Profile link: http://faculty.ksu.edu.sa/75830/default.aspx (http://faculty.ksu.edu.sa/75830/default.aspx)

Dr. Manoj Gupta

Associate Professor,

Department of Mechanical Engineering, NUS, 9 Engineering Drive 1, Singapore

Email: mpegm@nus.edu.sg

Profile link: http://me.nus.edu.sg/about-us/people/academic-staff/materials/ (http://me.nus.edu.sg/about-us/people/academic-staff/materials/)

Dr. Rui Xiao

Professor,

School of Energy and Environment, Southeast University, China

Email: ruixiao@seu.edu.cn

Profile link: http://power.seu.edu.cn/ny_en/ad/de/c11777a110046/page.htm (http://power.seu.edu.cn/ny_en/ad/de/c11777a110046/page.htm)

Dr. Ming-Chih Shih

Professor,

Department of Health and Nutrition Science,

Chinese Culture University, Taiwan

Email: smz2@faculty.pccu.edu.tw

Profile link: NA

Dr. Giovanni Bucci

Professor,

Department of Industrial Engineering and Information and economy,

University of L’Aquila, Italy

Email: giovanni.bucci@univaq.it, bucci@ieee.org

Profile link: https://goo.gl/f6hbDM (https://goo.gl/f6hbDM)

Dr. Grzegorz Golanski

Professor,

Institute of Materials Engineering,

Czestochowa University of Technology, Poland

Email: grzegorz.golanski@pcz.pl

Profile link: NA

Dr. Essam E Khalil

Professor of Energy,

Cairo University, Cairo, Egypt

Email: khalile1@asme.org

Profile link: NA

Dr. Santiago Silvestre

Associate Professor,

Telecommunications Engineering, Universitat Politècnica de Cataluny, Spain

Email: santiago.silvestre@upc.edu

Profile link: https://goo.gl/9XaZLz (https://goo.gl/9XaZLz)

Dr. Aleksey Aleksandrovich Hlopitskiy

Professor,

Department of Technology inorganic substances,

Ukrainian State University of Chemical Technology, Ukraine

Email: ahlopitskiy@gmail.com

Profile link: NA

Dr. João Miguel Dias

Associate Professor,

Habilitation in Department of Physics, CESAM,

University of Aveiro, Portugal

Email: joao.dias@ua.pt

Profile link: https://goo.gl/pzxoEw (https://goo.gl/pzxoEw)

Centre for Development Research,

University of Natural Resources and Life Sciences (BOKU), Vienna, Austria

Email: hamid.elbilali@boku.ac.at, elbilali@iamb.it

Profile Link: NA

Dr. Qing-Wen Wang

Professor,

Department of Mathematics, Shanghai University, P.R. China

Email: wqw@shu.edu.cn

Profile link: http://math.shu.edu.cn/teacher/wangqingwen/ (http://math.shu.edu.cn/teacher/wangqingwen/)

Dr. Yu Hai-Liang

Professor,

College of Mechanical, and Electrical Engineering,

Central South University, China

Email: hailiang@uow.edu.au

Profile link: https://goo.gl/aRyT2x (https://goo.gl/aRyT2x)

Dr. Fernando Reboredo

Professor,

Department of Earth Sciences, New University of Lisbon, Portugal

Email: fhr@fct.unl.pt

Profile link: http://www.dct.fct.unl.pt/pessoas/docentes/fernando-reboredo
(http://www.dct.fct.unl.pt/pessoas/docentes/fernando-reboredo)

Dr. David Coman

Professor,

Medical Director of Paediatrics, The Wesley Hospital, Brisbane, Australia
And
The Lady Cilento Children's Hospital, Brisbane, Australia

Email: David_Coman@health.qld.gov.au, david.coman@hotmail.com

Profile link: NA

Dr. Sylwia Myszograj

Professor,

Department of Water Technology, Sewage and Wastes,

Email: pavel_k7@yahoo.com

Profile Link: NA

Dr. Umar Nirmal

Senior Lecturer,

Centre of Advanced Mechanical and Green Technology,

Faculty of Engineering and Technology,

Multimedia University, Malaysia

Email: nirmal@mmu.edu.my, nirmal288@zoho.com

Profile Link: https://mmuexpert.mmu.edu.my/nirmal (https://mmuexpert.mmu.edu.my/nirmal)

Dr. Nagesh Peddada

Department of Biophysics,

University of Texas Southwestern Medical Center, USA

Email: nagesh.peddada@utsouthwestern.edu, nagesh.mku@gmail.com

Profile Link: NA

Dr. Ana Pedro

Professor,

Department of Education,

University of Aveiro, Aveiro, Portugal

Email: ana.pedro@ua.pt

Profile Link: NA

Dr. Md. Hossain Ali

Chief Scientific Officer, and Head,

Agril. Engg. Division,

Bangladesh Institute of Nuclear Agriculture (BINA)

Bangladesh Agricultural University Campus,

Bangladesh

Email: mh_ali@bina.gov.bd (mailto:mh_ali@bina.gov.bd), hossain.ali.bina@gmail.com (mailto:hossain.ali.bina@gmail.com),

mha_bina@yahoo.com (mailto:mha_bina@yahoo.com)

Profile Link: http://www.mhali.com/CV.html (http://www.mhali.com)http://www.mhali.com/CV.html (http://www.mhali.com)

Dr. Tushar Ranjan

Assistant Professor,

Department of Molecular Biology & Genetic Engineering,

Bihar Agricultural University, Sabour, India

Email: mail2tusharranjan@gmail.com

Profile Link: NA

Dr. Bishun Deo Prasad

Assistant Professor,

Department of Molecular Biology & Genetic Engineering,

Bihar Agricultural College, Bihar Agricultural University, India

Email: bdprasadbau@gmail.com

Profile Link: NA

Dr. Sangita Sahni

Assistant Professor,

Department of Plant Pathology, Tirhut College of Agriculture,

Dr. Rajendra Prasad Central Agricultural University, India

Email: sangitampp@gmail.com

Profile Link: NA

Dr. Awadhesh Kumar Pal

Assistant Professor,

Department of Biochemistry and Crop Physiology,

Bihar Agricultural University, India

Email: awapal@gmail.com

Profile Link: NA

Dr. Aydin Unay

Professor,

Department of Field Crops, Faculty of Agriculture,

University of Aydin Adnan Menderes, Turkey

Email: aunay@adu.edu.tr

Profile Link: NA

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Rahim Husain
Faculty of Fisheries and Marine Science, Gorontalo State University, Jend. Sudirman, No. 6, Gorontalo City, Indonesia.

Rieny Sulistijowati
Faculty of Fisheries and Marine Science, Gorontalo State University, Jend. Sudirman, No. 6, Gorontalo City, Indonesia.

Abstract

This research was conducted at the Fisheries Technology Laboratorium Department of Fisheries and Marine Sciences, Gorontalo State University, at the Mey 2018 for three months in a month. Fish has a high nutritional value and is a major food source in many countries. Lipid fish has a high content of polyunsaturated acids (PUFA), especially eicosapentaenoic acid (EPA;20:5n-3) and docosahexenoate acid (DHA; 22: 6n-3). This study aims to the impact effect of temperature and storage time of the fatty acid snapper fillet (*Lutjanus sp*) and damage caused by the storage process. The sample selection stage is Snapper (*Lutjanus* sp) fresh weeds, and the meat is released by gills, bones, then washed and rinsed with ice water to remove blood and other debris. Contineus does the cleavage from head to tail without causing his back to be disturbed. Filleting is done by slicing the meat ribs longitudinally to produce boneless meat. Stored at temperatures of 0, 10, 20, 30 and 40°C for 45 days. The results of fatty acid analysis snapper fillet (*Lutjanus* sp) has a saturated fatty acid lauric acid, acid tridecanoic, myristate acid, pentadecanoic acid, palmitic acid, stearic acid, heneicosanoic acid, behenic acid, lignoceric acid, acid and acid heptadecanoate arachidic. Monounsaturated fatty acids oleic acid, nervonic acid, palmitoleic acid, acid and acid erucat eicosanoic, while polyunsaturated fatty acids eicosatetraenoate acid, dokosadinoat

acid, eicosapentaenoic acid, eikosatrioanat acid, arachidonic acid and linolenic acid are susceptible to oxidative damage. Increased primary peroxide snapper fillet (*Lutjanus sp*) the higher the storage temperature increases from 0°C to 40°C. TBA value increases from 0° to 40°C with increased storage time of one day to 45 days storage time. From the results of this study found a way for Snapper fish fillets *(Lutjanus sp*) to have a longer expiration in storage, from 1 day to 45 days without reducing the Omega and DHA content.

Keywords:

Fillet snapper (Lutjanus sp), fatty acids, peroxide value and TBA value.

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Effect of Temperature and Long Storage of Fatty Acid Profile, Value Peroxide and Value TBA Fillet of Snapper (*Lutjanus sp*)

Rahim Husain[1*] and Rieny Sulistijowati[1]

[1]Faculty of Fisheries and Marine Science, Gorontalo State University, Jend. Sudirman, No. 6, Gorontalo City, Indonesia.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

This research was conducted at the Fisheries Technology Laboratorium Department of Fisheries and Marine Sciences, Gorontalo State University, at the Mey 2018 for three months in a month. Fish has a high nutritional value and is a major food source in many countries. Lipid fish has a high content of polyunsaturated acids (PUFA), especially eicosapentaenoic acid (EPA;20:5n-3) and docosahexenoate acid (DHA; 22: 6n-3). This study aims to the impact effect of temperature and storage time of the fatty acid snapper fillet (*Lutjanus sp*) and damage caused by the storage process. The sample selection stage is Snapper (*Lutjanus* sp) fresh weeds, and the meat is released by gills, bones, then washed and rinsed with ice water to remove blood and other debris. Contineus does the cleavage from head to tail without causing his back to be disturbed. Filleting is done by slicing the meat ribs longitudinally to produce boneless meat. Stored at temperatures of 0, 10, 20, 30 and 40°C for 45 days. The results of fatty acid analysis snapper fillet (*Lutjanus* sp) has a saturated fatty acid lauric acid, acid tridecanoic, myristate acid, pentadecanoic acid, palmitic acid, stearic acid, heneicosanoic acid, behenic acid, lignoceric acid, acid and acid heptadecanoate

**Corresponding author: E-mail: imrahim76@yahoo.co.id;*

arachidic. Monounsaturated fatty acids oleic acid, nervonic acid, palmitoleic acid, acid and acid erucat eicosanoic, while polyunsaturated fatty acids eicosatetraenoate acid, dokosadinoat acid, eicosapentaenoic acid, eikosatrioanat acid, arachidonic acid and linolenic acid are susceptible to oxidative damage. Increased primary peroxide snapper fillet (*Lutjanus sp*) the higher the storage temperature increases from 0°C to 40°C. TBA value increases from 0° to 40°C with increased storage time of one day to 45 days storage time. From the results of this study found a way for Snapper fish fillets *(Lutjanus sp*) to have a longer expiration in storage, from 1 day to 45 days without reducing the Omega and DHA content.

Keywords: Fillet snapper (Lutjanus sp); fatty acids; peroxide value and TBA value.

1. INTRODUCTION

In general, the fish has no nutritional value and is a major food source in many countries. Lipid fish has a high content of polyunsaturated acids (PUFA), especially eicosapentaenoic acid {EPA; 20: 5n-3} and docosahexenoate acid (DHA; 22: 6n-3) [1,2]. Processing by freezing the fish has been used for thousands of years because of the quality and high product [3]. The concept of storage by freezing depends on the product temperature decrease to slow decay so that when the fish melted freshness can be maintained [4].

However, fish and fishery products may undergo undesirable changes during storage and can damage the storage time limit. Unwanted changes resulting from the oxidation of proteins [5,6] and lipid oxidation [7,8]. Fish protein experienced a number of changes (cause cannot form aggregates) that modify the structural and functional properties of fish muscle [9].

Degradation of polyunsaturated fatty acids (PUFA) by lipid oxidation during storage led to the formation of volatiles associated with rancidity [1]. The high level of unsaturated fats makes the fish tissue is very susceptible to peroxidation and easily damaged. Oxidative changes primarily related to the taste and texture of the fish. In later stages of the process of lipid peroxidation, changes in color and nutritional value will be observed or secondary products of lipid [10]. This study aims to determine the effect of temperature and storage time of the fatty acid snapper fillet (*Lutjanus sp*) and damages resulting from the storage process.

2. MATERIALS AND METHODS

2.1 Raw Material

Raw materials snapper (*Lutjanus sp*) obtained from the fish auction place (TPI) kobong, Village Kaligawe, Semarang, Central Java.

2.2 Sample Preparation Fish Fillets

The sample selection stage is Snapper (*Lutjanus* sp) fresh weeds, and the meat is released by gills, bones, then washed and rinsed with ice water to remove blood and other debris. Contineus does the cleavage from head to tail without causing his back to be disturbed. Filleting is done by slicing the meat ribs longitudinally to produce boneless meat. Stored at temperatures of 0, 10, 20, 30 and 40°C for 45 days.

2.3 Proximate Analysis

Chemical analysis: Proximate moisture content, ash content, protein and fat by AOAC [11].

Fatty Acid Analysis Procedure

a. Hydrolysis

After selecting the sample, then the sample is cleaned with water, then mashed and weighed ± 10 g of the sample. Hydrolysis with 10 ml HCl. then the water is heated at a temperature of 70°C, boiling. Cold. Extract with 15 ml of diethyl ether and 15 ml of oil, take the top layer. Extract again with 15 ml of diethyl ether and 15 ml of oil, take the top layer, make one with the previous results. Steamed in a water bath with the help of N2.

b. Analysis of saturated fatty acids and unsaturated

Taken 0.5 ml sample, add 1.5 ml of sodium methanolic solution, cover and heat at 70°C for 5-10 minutes while being shaken. Chill. Add 2 ml Boron trifluoride ethanoic, heat at 70°C for 5-10 minutes. Chill. Extract with 1 ml of heptane and 1 ml saturated NaCl. Take the top layer and put in Eppendorf. Injected into the GC. Injected as much 1µ samples on GC - 2010 SHIMADZU.

2.4 Analysis Value Peroxide

Samples (0.5 g) put in a test tube, then added 0.1 ml of a solution of ammonium thiocyanate and 0.1 ml of solution feroklorida. The test tube is shaken for 5 seconds and heated at 50°C for 2 minutes, then cooled to a temperature of 25°C. Use absorbance using a spectrophotometer at a wavelength of 510 nm. A blank solution prepared using all solvent without the sample (Hills and Thiel, 1946 modified Adnan [12]).

2.5 Analysis Value TBA (Expand)

Analysis of figures TBA performed according to the method Tokur and Korkmaz [13]. Oil added 0.5 g in 50 ml of distilled water, then add another 2.5 mL N HCl then distilled. Absorb distilled to 50 ml, 5 ml of distilled download then added with 5 ml TBA. Thereafter, heated for 30 minutes and cooled. Absorbance at a wavelength of 528 nm. Value TBA = mg malonaldehyde / kg of oil.

3. RESULTS AND DISCUSSION

3.1 Proximate Fish Snapper (*Lutjanus sp*)

Based on Table 1 fat content snapper (*Lutjanus sp*) in the study was 1.96% compared to that reported by de Castro et al. [14] on tilapia (*Oreochromis niloticus*), i.e 0.79% and tambagui (*Colossoma macropomum*) i.e 1.30%. The fat content rough on snapper (1.96%) is still higher, it indicates that the snapper (*Lutjanus sp*) belong to the fish that contains high fat enough.

Table 1. Proximate fish snapper (*Lutjanus sp*) and Fe content

No	Chemical composition	Amount (%)
1.	Moisture	78,39
2.	Ash	1,58
3.	Protein	18,77
4.	Fat	1,96
5.	Carbohydrate by difference	0,30
6.	Fe (ppm)	121,7

Description: Data is derived from repeat 3x

Differences in fish fat content are strongly influenced by the type of fish, fish size, fishing season and the environment in which the fish live. According to Shaviklo [15] demersal fish higher in fat than pelagic fish that lives in surface waters. Demersal fish usually live in the bottom waters and rarely engage in the activity. In Table 2 also shows the snapper (*Lutjanus sp*) containing Fe total was 121.47 ppm. Okada report [16] describes the color of the flesh of fish due to the Fe content in the meat is very high because it is rich hemoprotein (80%) mainly myoglobin and hemoglobin. Based Okada [16], the content of white meat hemoprotein red snapper low so the meat is white.

3.2 Composition Fatty Acid

Based on the analysis of fatty acids snapper fillet (*Lutjanus sp*) are listed in Table 4, snapper fillet (*Lutjanus sp*) has saturated fatty acids (Saturated Fatty Acid, SFAs), which consists of lauric acid, acid tridecanoic, acid myristate, acid pentadecanoic, palmitic acid, stearic acid, heneicosanoic acid, behenic acid, lignoceric acid, acid and acid heptadecanoatearachidic. Acids monounsaturated fats (MUFA) consisting of: oleic acid, acid nervonat, palmitoleic acid, acid erucat and sour eicosanoic, while the unsaturated fatty acid compound (Poly Unsaturated Fatty Acids, PUFAs) consisting of acid eicosatetraenoate, dokosadinoat acid, eicosapentaenoic acid, eikosatrioanat acid, arachidonic acid and linolenic acid are susceptible to oxidative damage.

According Nazemroaya et al. [17]; Karami et al. [18] that when the fish are kept in a long time then, the amount of saturated fatty acids (Saturated Fatty Acid, SFA) will increase as well as fatty acids monounsaturated (Mono Unsaturated Fatty Acid, MUFA) will be slightly experience improved although not too significant. While polyunsaturated fatty acids (Poly Unsaturated Fatty Acids, PUFAs) experienced a reduction process. This is similar to the research conducted at the snapper fillet (*Lutjanus sp*) during storage.

Aranda et al. [19] states that the oxidation of PUFAs begins with the production of hydrogen peroxide with three different ways: (1) autooksidasi, (2) enzymatic oxidation, and (3) photooxidation, which can also occur simultaneously. Product peroxide decomposes by different mechanisms, forming a secondary oxidation products; both the primary and secondary oxidation products can react with

amino groups of proteins, producing compounds that modify the interaction of taste, smell and functional properties of proteins.

Furthermore, the fraction of volatile compounds is indicated as the cause of rancidity in fatty fish [19]. Secbecic and Beutelspecher [20] states that the oxidation is the process of fat breakdown and lead to the formation of off-flavor compounds and condition is called rancid (rancid). Processed food products were rancid, may experience discoloration and loss of nutritional value for the oxidation of unsaturated fatty acids (PUFA) that impact on the quality. The compound oxide such as peroxides, aldehydes, and ketones harmful to human health. While McClement and Decker [21] states the factors that affect the speed of oxidation include the number and type of oxygen, the chemical structure of lipids, antioxidant and prooxidant form: ferrous metals, sensitiser, storage temperature and properties of packaging materials.

3.3 Effect of Temperature and Time against Value Peroxide

Value peroxide as primary products of oxidation snapper fillet (*Lutjanus sp*) during storage at different temperatures and times can be seen in Table 3.

In the treatment of frozen storage temperature (0°C) shows the formation of peroxides to 45 days of storage. Speed peroxide formation increased 9.6 times at a temperature of 0°C with a storage temperature increases, while at a temperature of 10, 20, 30, and 40°C peroxide value increased respectively 14.33, 16.12, 19.19, and 23.05 times meq/kg sample with increased storage temperature. The peroxide values increased from 0° to 40°C with increased storage time of one day to 45 days storage time. Increased primary peroxide snapper fillet (*Lutjanus sp*) the higher the storage temperature increases from 0°C to 40°C.

Table 2. Composition fatty acids of snapper fillet (*Lutjanus sp*) during storage

No	Storage temperature (°C)					
	Profil asam lemak (%)	**0°C**	**10°C**	**20°C**	**30°C**	**40°C**
1	Lauric acid	0,703	-	-	0,99	-
2	Tridecanoac acid	0,001	-	-	0,86	-
3	Myristic acid	4,687	0,74	4,44	2,69	0,51
4	Pentadecanoac acid	0,001	0,90	1,03	2,46	0,38
5	Palmetic acid	2,283	1,67	4,39	3,58	12,94
6	Stearic acid	0,708	-	9,19	15,46	12,14
7	Heneicosanoac acid	13,462	-	0,78	2,03	-
8	Behenac acid	-	1,04	0,65	0,68	1,54
9	Lignoserat acid	0,762	-	0,74	-	0,55
10	Heptadecanoac acid	17,811	-	1,96	-	-
11	Arachidac acid	2,945	-	-	-	-
I	Saturated Fatty Acid (SFA)	25,552	4,35	32,73	31,75	28,06
1	Oleic acid	8,807	12,63	16,37	22,70	10,82
2	Nervonac acid	1,64	1,34	1,03	1,27	-
3	Palmitoleic acid	13,239	2,59	-	-	-
4	Erucat acid	-	5,43	5,26	5,43	3,58
5	Eicosanoac acid	0,001	8,34	-	-	-
II	Mono Unsaturated Fatty Acid(MUFA)	23.687	23,72	22,66	29,4	14,4
1	Eicosatetraenoic acid	-		-	5,60	1,05
2	Docosadinoac acid	0,827	-	0,43	-	0,70
3	Eicosapentanoac acid	6,055	3,52	2,29	0,43	-
4	Eicosatrienoac acid	1,557	2,6,23	9,82	-	-
5	Arachidonac acid	0,692	-	-	-	-
6	Docosaheksanoac acid	5,31	-	0,17	0,25	-
7	Linoleict acid	10, 612	1,52	3,27	2,56	3,57
III	Poly Unsaturated Fatty Acid (PUFA)	25,055	14,99	15,98	8,84	10,32
Total		74,294	103.07	101.37	99,99	82,78

Description: Data is derived from repeat 2x

Table 3. Date analysis peroxide value snapper fillet (*Lutjanus sp*)

Temperature 0°C		
N0	**Storage temperature (day)**	**Peroxide Value (meq/kg)**
1	0	1.7411
2	5	2.9437
3	10	4.06055
4	15	5.296
5	20	6.7797
6	25	6.29125
7	30	10.905
8	35	11.4923
9	40	12.98225
10	45	13.21835
Temperature 10°C		
N0	**Storage temperature (day)**	**Peroxide Value (meq/kg)**
1	0	1.7411
2	3	3.26525
3	6	5.63635
4	9	6.90375
5	12	6.3911
6	15	9.60175
7	18	10.78685
8	21	10.4857
9	24	14.5174
10	27	15.9977
Temperature 20°C		
N0	**Storage temperature (day)**	**Peroxide Value (meq/kg)**
1	0	1.7411
2	1	4.21665
3	2	6.96335
4	3	8.3699
5	4	8.5134
6	5	11.22005
7	6	11.963
8	7	15.59645
9	8	15.9638
10	9	18.0701
Temperature 30°C		
N0	**Storage temperature (day)**	**Peroxide Value (meq/kg)**
1	0	1.7411
2	0.5	4.5663
3	1	7.06935
4	1.5	9.2808
5	2	10.422
6	2.5	12.1345
7	3	11.83165
8	3.5	16.974
9	4	18.703
10	4.5	20.4086

Temperature 40°C		
N0	**Storage temperature (day)**	**Peroxide Value (meq/kg)**
1	0	1.7411
2	0.25	4.67575
3	0.5	7.7808
4	0.75	10.7164
5	1	12.06535
6	1.25	12.6637
7	1.5	18.4146
8	1.75	18.42355
9	2	22.9266
10	2.25	24.62795

Description: Data is derived from repeat 3x

Table 4. Data analysis value TBA snapper fillet (*Lutjanus sp*)

Temperature 0°C		
No	**Storage temperature (day)**	**Value TBA (mg MDA/kg)**
1	0	2.307378
2	5	3.504316
3	10	5.277034
4	15	6.573477
5	20	6.315832
6	25	9.565049
7	30	11.91097
8	35	11.75207
9	40	13.71696
10	45	14.62961
Temperature 10°C		
No	**Storage temperature (day)**	**Value TBA (mg MDA/kg)**
1	0	2.307378
2	3	4.299369
3	6	6.748229
4	9	6.105547
5	12	10.76352
6	15	13.41159
7	18	13.2912
8	21	15.61061
9	24	16.80039
10	27	17.21704
Temperature 20°C		
No	**Storage temperature (day)**	**Value TBA (mg MDA/kg)**
1	0	2.307378
2	1	4.424119
3	2	6.195105
4	3	6.932098
5	4	10.79865
6	5	13.33775
7	6	13.45672
8	7	17.74074
9	8	18.62311
10	9	20.31495

Temperature 30°C		
No	**Storage temperature (day)**	**Value TBA (mg MDA/kg)**
1	0	2.307378
2	0.5	5.887911
3	1	7.589422
4	1.5	8.931236
5	2	8.773049
6	2.5	13.85214
7	3	14.5131
8	3.5	14.5922
9	4	20.7325
10	4.5	22.03099
Temperature 40°C		
No	**Storage temperature (day)**	**Value TBA (mg MDA/kg)**
1	0	2.307378
2	0.25	5.975746
3	0.5	7.946435
4	0.75	8.185896
5	1	8.54802
6	1.25	10.79128
7	1.5	15.43709
8	1.75	15.59018
9	2	20.52694
10	2.25	23.57116

Description: Data is derived from repeat 3x

According to Pak et al. [22], peroxide value is an indicator of the stability of the oil against oxidation, the oxidation products of primary lipid parameters, namely hydroperoxide. Oxidation of lipids/oils naturally easily occurs, because tuna fish oil rich in PUFAs (6 double bonds), while oil containing many double bonds susceptible to lipid oxidation reactions. Thus, the oxygen molecules that are attached to the double bond susceptible to oxidation.

3.4 Effect of Temperature to Value TBA

Value TBA is used to measure the secondary products of lipid oxidation, especially coming from PUFA (hide no, 2012) and indicates the level of rancidity, especially in the high PUFA-containing oil [23]. TBA formation as a secondary oxidation products snapper fillet (*Lutjanus sp*) during storage can be seen in Table 4.

Value TBA increased 7.21 times at a temperature of 0°C with an increase in storage temperature, whereas at a temperature of 10, 20, 30, and 40°C peroxide value increased respectively to 9.19, 9.89, 10.63, and 12.59 times the MDA mg/kg of the sample with increased storage temperature. Value TBA increases from 0° to 40° with increased storage time of one day to 45 days storage time. In the treatment of storage temperature of 0°C-40°C showed the formation of value TBA during storage [23].

4. CONCLUSION

Differences in fat content of the fish are strongly influenced by the freshness of the fish is used as a critical factor in resulted isolates, methods of isolation/extraction is used, homogenization of meat processing, the ratio of fish and solvents (viscosity) used, length of extraction, time and temperature processing and dissolution protein. Snapper fillet (*Lutjanus sp*) has a saturated fatty acid comprising: lauric acid, acid tridecanoic, myristate acid, pentadecanoic acid, palmitic acid, stearic acid, heneicosanoic acid, behenic acid, lignoceric acid, acid and acid heptadecanoatearachidic. Fatty acids are monounsaturated consisting of: oleic acid, acid nervonat, palmitoleic acid, acid erucat and sour eikosanoat, while the unsaturated fatty acid compound consisting of: acid eicosatetraenoate, acid dokosadinoat acid, eicosapentaenoic acid eikosatrioanat, arachidonic acid and linolenic acid susceptible to oxidative damage.

Speed formation of peroxide value increased 9.6 times at a temperature of 0°C with a storage temperature increases, while at a temperature of 10, 20, 30, and 40°C peroxide value increased

respectively 14.33, 16.12, 19.19 and 23.05 times meq/kg sample with increased storage temperature. Value TBA increased 7.21 times at a temperature of 0°C with an increase in storage temperature, whereas at a temperature of 10, 20, 30, and [10] 40°C peroxide value increased respectively to 9.19, 9.89, 10.63, and 12.59 times the MDA mg/kg of the sample with increased storage temperature.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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