



Speech of the Chairman of the Preparatory Committee for the Conference

Prof. Dr. Razzaq Shalan Augul

Department of Insects and Invertebrates/ Iraq Natural History Research Center and Museum-University of Baghdad

In the Name of Allah the Merciful Peace, mercy and blessings of God be upon you

The first international scientific conference for natural history and wildlife is held proceeding from the importance of studying natural history as it provides direct knowledge of living organisms, their diversity, their impact on human health and economics, their identity, their place, their food chain and behavior patterns, and the investigation of the natural relationships among them and their impact on non-living components, and to determine the state of biodiversity and identify endangered species and their conservation status as an important part of sustainable development programs and our belief in the importance of scientific research in addressing this and developing appropriate scientific solutions. The idea of this first international specialized scientific conference on natural history and wildlife has matured based on the principle of community service and the important role of the Natural History Research Center and Museum- University of Baghdad in the study of emergency environmental phenomena, and for being the contemplated benefit more serious, away from the generality common in previous conferences. This conference is the first of its kind in Iraq, it aims to share and exchange ideas, activities and global and local research conclusions and build capacity through the exchange of science and discussion of problems of common interest and competence that will advance scientific research and meet the requirements of society as well as the building research capabilities mixed with field experiences in the field of wildlife, which is one of the rare scientific disciplines in Iraq and the regional region. The preservation of biodiversity is of special importance from an academic, scientific and health point of view, as studies indicate that the decline in animal diversity increases the risks of human infection with many different diseases, as well as its importance from an economic point of view and the development of eco-tourism concepts until it has become an important economic resource in financial budgets to countries, that necessitates facing the risks that nature faces in light of the great urban sprawl towards the green areas surrounding cities, not to mention air pollution, groundwater depletion and desertification, all of which threaten all forms of life. Likewise, it is necessary to work on natural agricultural production without the use of toxic chemicals that harm humans and the environment, and to work on the use of natural materials in combating various pests and to activate laws that contribute and support environmental balance, prevent overfishing, establish reserves and protect natural sites. Accordingly, and through this conference, the efforts of all researchers and specialists must be united. To come up with a scientific vision that extends the hand of peace to nature and the world in which we live, which must be a sustainable vision for its resources. This conference has attracted researchers and experts from different Arab and foreign universities and countries, including: Egypt, Libya, Morocco, Yemen, Iran, USA, Scotland, Australia, Germany, Congo, Italy, Indonesia and South Korea. I would like to conclude by expressing appreciation and praising of all the sponsors and supporters of the conference, in particular: His Excellency the Minister of Higher Education and Scientific Research, President of the University of Baghdad.

Wishing everyone progress and prosperity.....and peace, mercy and blessings of God be upon



Speech of the Chairman of the Scientific Committee

Prof Dr. Moutaz A. M. Al-Dabbas
University of Baghdad

In the name of Allah the Merciful Peace, mercy and blessings of God be upon you

Praise is to God, who enabled us to organize this conference, which is (the first international scientific conference on natural history and wildlife for the period from 24-25/11/2021). Under the slogan "Protecting wildlife is the future of the national economy". Geoparks and geoheritage sites are of great cultural and scientific importance as geodiversity is in harmony with biodiversity and allows for the creation of sustainable economic activities through their organization and investment. UNESCO is interested in raising awareness and participation by integrating local geoparks into the global network of geoparks to exchange experiences at the international level so that the geopark is an important factor in economic development and provides infrastructure for tourism development and revitalization, which will open the way for the production of a new source of income for the population. This is why we celebrate our heritage while preserving cultural, biological and geological diversity and promoting sustainable economic development. Professors and researchers specialized in life sciences, environment, earth sciences and related sciences from all our dear governorates, as well as Arab brothers, researchers from Libya, Yemen and Egypt, and foreign researchers from Iran, Germany, Congo, Italy, Indonesia, South Korea, the United States of America, Australia and New Zealand participated in this conference. These participations were like bouquets of flowers that added splendor to the wedding of the Natural History Research Center and Museum, and reflected the unity of the Iraqis in its best forms, and embodied their love for their people and their country, and their progression on the path of science and progress. The number of participating research exceeded the 58 researches and study, all of which were checked by two specialists in the Scientific Committee and by 36 in the life sciences disciplines. These extracts included a wide range of disciplines such as taxonomy and its applications in community service, natural reserves, biodiversity and conservation, environmental systems and its management and comparative anatomy of wild species and wildlife diseases. The disciplines of geosciences also included geodiversity, geological parks, natural heritage, natural resources, sustainability and desertification, with 22 research and studies. Thus, this conference of ours is considered one of the largest scientific conferences, as it included up to 210 participating researchers, except for researchers who had attendance only. Finally, the Scientific Committee is pleased to extend their sincere thanks and gratitude to everyone who has a participation or attendance, especially the brothers and guests who have taken the trouble of traveling and attending our beloved capital, Baghdad, and thanks are extended to colleagues in the Preparatory Committee with all their names, such as the supervisory, advisory, scientific, supportive and financial committee. I ask God for our conference the success and to achieve its goals to serve our dear beloved Iraq. Peace, mercy and blessings of God.

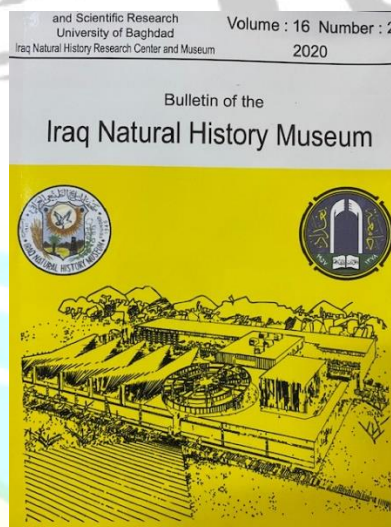


Bulletin of the Iraq Natural History Museum (Bull. Iraq nat. Hist. Mus.)

Bulletin of the Iraq Natural History Museum is a refereed biannual scientific journal issued by Iraq Natural History Research Center and Museum, University of Baghdad, which founded in 1961, scientific open access journal, publishing original articles and case reports (short communications) in the natural history sciences.

This journal is published twice a year, by 8-12 articles in each issue, according to the priority of manuscript acceptance. The variation in research areas for each issue is considered.

<https://jnhm.uobaghdad.edu.iq/index.php/BINHM/Home>

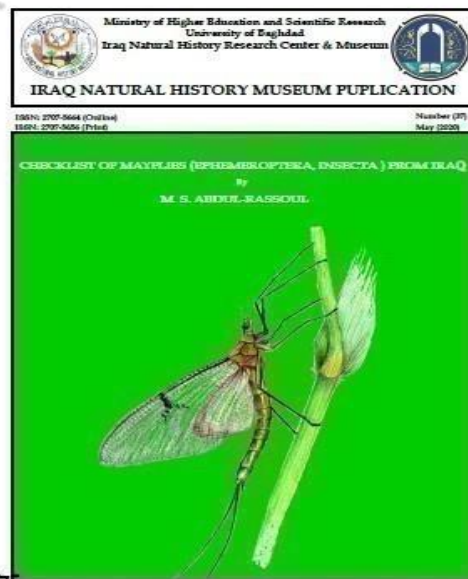




Iraq Natural History Museum Publication

The Iraq Natural History Museum Publication, that's affiliated with the Iraq Natural History Research Center and Museum/ University of Baghdad, is a peer reviewed, scientific open access journal, publishing long contribution in the natural history sciences. This publication is published in two numbers per a year (31 May and 30 Nov.) and only one article in each number. It is interested in publishing the Monographs, Original articles, article reviews and Checklists that are concerned with the natural history of biology (Animals, Plants and Fungi), Taxonomy, Biodiversity, Wildlife Sciences, Comparative Anatomy of Wildlife Animals, Wildlife Ecology, Ecosystems, Natural Resources and Geology that includes: Paleontology, Rocks, Minerals, Geomorphology and Geological diversity.

<https://pinhm.uobaghdad.edu.iq/index.php/pinhm/Home>





THE ABSTRACTS
of the
FIRST INTERNATIONAL CONFERENCE
OF NATURAL
HISTORY AND WILDLIFE (ICNHW)
24- 25 November 2021
Iraq Natural History Research Center and
Museum, University of Baghdad
Iraq



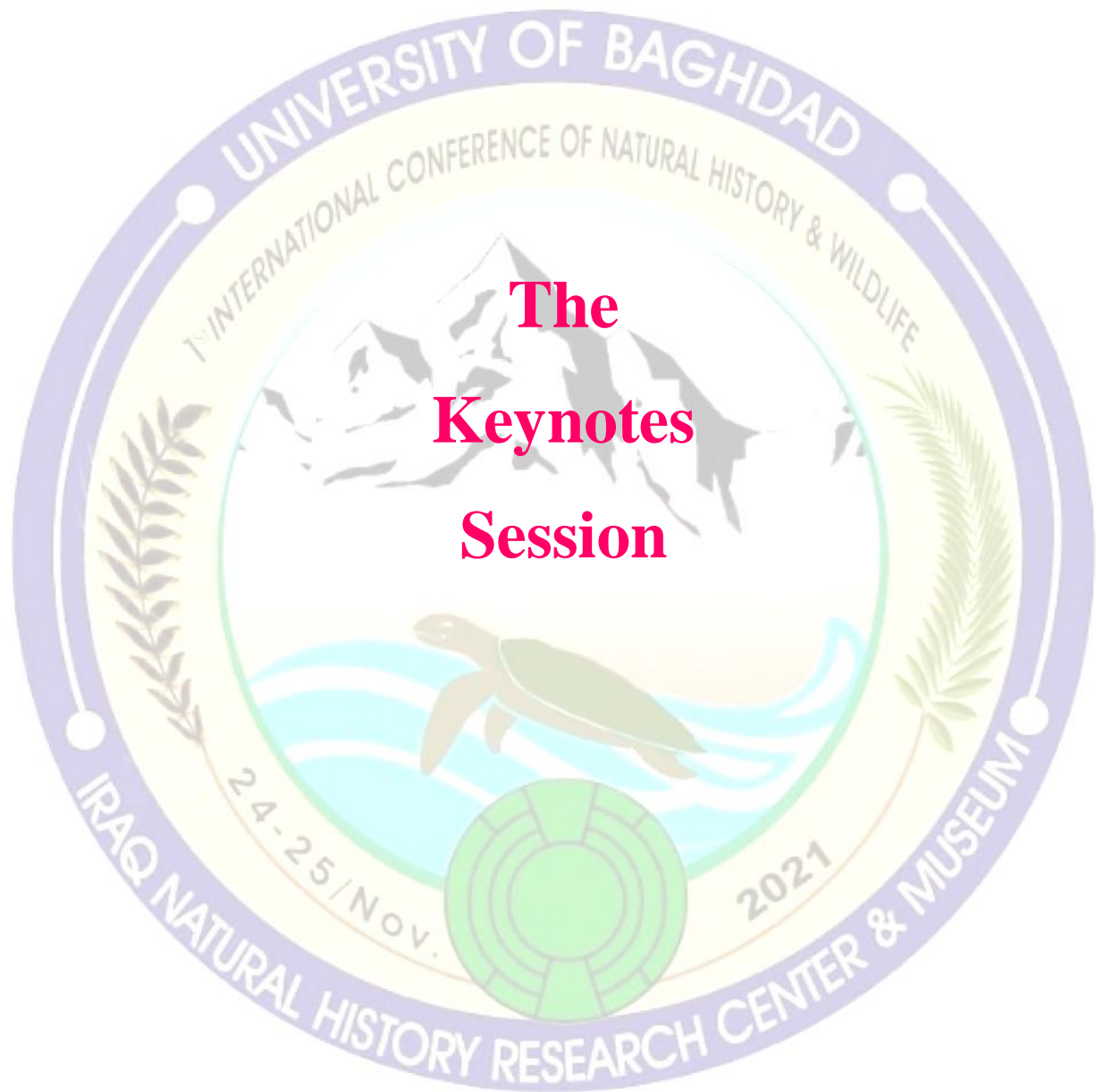
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First Keynote

Wildlife Science in a Fast-paced World: Using Camera Traps to Connect with People

M. Colter Chitwood, Assistant Professor,
Oklahoma State University, Stillwater, Oklahoma, USA
CORRESPONDING Author E-mail: colter.chitwood@okstate.edu

Abstract

Wildlife evoke many emotions across American society. Some people like to watch animals in parks and feed birds in their backyards; other people spend thousands of dollars on guided hunts because they like to see large antlers on elk (*Cervus canadensis*) or like the taste of game meat. Regardless an individual's motivation for supporting wildlife, the monetary value of that support is unquestioned and is reflected in the U.S. economy. For example, in a national survey of Americans in 2016, the U.S. Fish and Wildlife Service determined that wildlife watchers spent \$75.9 billion, anglers spent \$46.1 billion, and hunters spent \$26.2 billion; combined, these 3 wildlife-focused groups contributed \$156.9 billion to the U.S. economy. Unfortunately, some evidence (especially for hunting) indicates declining participation in outdoor- or wildlife-related activities. Many wildlife conservation professionals are concerned that children spend increasing amounts of time indoors, gaming, or on social media, which will result in future adults that will be less engaged with the natural world and less likely to support wildlife management and conservation. One way that new technologies are helping to combat this problem is through the use of camera traps for wildlife research, teaching, and public outreach. Camera trapping is now quite common worldwide in many aspects of wildlife research and conservation, from monitoring threatened and endangered species to remotely estimating important population parameters that allow managers to better assess harvest management of common species. In this presentation, I will discuss how camera trapping can be research-oriented while also being used for encouraging the public's engagement with the natural world. By engaging the public and maintaining or increasing interest in wildlife, we can maintain revenue streams that benefit wildlife conservation for the future.



Curriculum Vitae of First Keynote lecture
M. Colter Chitwood, Assistant Professor, Oklahoma State University,
Stillwater, Oklahoma, USA
Ph.Dr. -Fisheries, Wildlife, and Conservation Biology, August 2014.
North Carolina State University.

EDUCATION

Ph.D. - Fisheries, Wildlife, and Conservation Biology, August 2014. North Carolina State University.

Dissertation: White-tailed deer population dynamics in the presence of a novel predator.

M.S. - Fisheries and Wildlife Sciences, May 2010. North Carolina State University.

Thesis: Assessment of hunters and white-tailed deer of Hofmann Forest, North Carolina.

B.S. - Environmental Sciences, May 2005. University of North Carolina at Chapel Hill.

Graduated with highest honors and distinction.

Thesis: Seasonal nutrient dynamics in University Lake, Carrboro, North Carolina.

PROFESSIONAL EXPERIENCE

2021- Present Assistant Professor of Forest Wildlife Ecology and Management, Oklahoma State University, Department of Natural Resource Ecology and Management.

2021- Present Affiliate, South Central Climate Adaptation Science Center

2019- 2020 Research Scientist, University of Montana, Wildlife Biology Program.

2019- Present Faculty Affiliate, University of Montana, W.A. Franke College of Forestry and Conservation, Wildlife Biology Program, Missoula, Montana.

2019- 2019 Research Assistant, University of Montana, Wildlife Biology Program.

2016- 2018 Postdoctoral Fellow and Boone & Crockett Fellow, University of Montana, Wildlife Biology Program.

2015- 2018 Postdoctoral Fellow, University of Missouri, Department of Fisheries and Wildlife Sciences. 2015- Present Adjunct Assistant Professor, Clemson University, College of Agriculture, Forestry and Life Sciences, Department of Forestry and Environmental Conservation, Clemson, South Carolina. 2014 - 2015 Postdoctoral Research Scholar, North Carolina State University, Fisheries, Wildlife, and Conservation Biology Program.

RECENT PEER-REVIEWED ARTICLES (Published = 43; In review = 4; In prep = 8)

2020 Chitwood, M. C., M. A. Lashley, S. D. Higdon, C. S. DePerno, and C. E. Moorman. Raccoon vigilance and activity patterns when sympatric with coyotes. *Diversity* 12:341. doi:10.3390/d12090341. (Invited submission to special issue: *Research in Carnivores: From Their Interspecific Relationships to Their Prey.*)

Michel, E. S., B. K. Strickland, S. Demarais, J. L. Belant, T. M. Kautz, J. F. Duquette, D. E. Beyer, Jr., M. J. Chamberlain, K. V. Miller, R. M. Shuman, J. C. Kilgo, D. R. Diefenbach, B. D. Wallingford, J. K. Vreeland, S. S. Ditchkoff, C. S. DePerno, C. E. Moorman, M. C. Chitwood, and M. A. Lashley. Relative reproductive phenology and synchrony affect neonate survival in a nonprecocial ungulate. *Functional Ecology*. doi:10.1111/1365-2435.13680.

Kroeger, T., M. A. Lashley, M. C. Chitwood, C. A. Harper, C. S. DePerno, and C. E. Moorman. Are overstory hardwoods important for white-tailed deer in longleaf pine woodlands? *Forest Ecology and Management* 464:118046.

2019 Stevenson, E. R., M. A. Lashley, M. C. Chitwood, J. E. Garabedian, M. B. Swingen, C. S. DePerno, and C. E. Moorman. Resource selection by coyotes (*Canis latrans*) in a longleaf pine



ecosystem: effects of anthropogenic fires and landscape features. *Canadian Journal of Zoology* 97:165-171.

Smith, T. N., C. T. Rota, B. J. Keller, M. C. Chitwood, T. W. Bonnot, L. P. Hansen, and J. J. Millspaugh. Resource selection of a recently translocated elk population in Missouri. *Journal of Wildlife Management* 83:365-378.

2018 Chitwood, M. C., B. J. Keller, H. S. Al-Warid, K. Straka, A. M. Hildreth, L. Hansen, and J. J. Millspaugh. Meningeal worm (*Parelaphostrongylus tenuis*) as a cause of mortality in the restored elk (*Cervus canadensis*) population in Missouri, USA. *Journal of Wildlife Diseases* 54:95-100.

Lashley, M. A., M. V. Cove, M. C. Chitwood, G. Penido, B. Gardner, C. S. DePerno, and C. E. Moorman. Estimating wildlife activity curves: comparison of methods and sample size. *Scientific Reports*. doi:10.1038/s41598-018-22638-6.

Smith, T. N., B. J. Keller, M. C. Chitwood, L. P. Hansen, and J. J. Millspaugh. Diet composition and selection of recently reintroduced elk in Missouri. *American Midland Naturalist* 180:143-159.

Sasmal, I., E. L. Kilburg, C. S. DePerno, M. C. Chitwood, M. A. Lashley, B. A. Collier, and C. E. Moorman. Eastern wild turkey roost-site selection in a fire-maintained longleaf pine ecosystem. *Southeastern Naturalist* 17:371-380.

For a complete list of publications, please see Google Scholar:

<https://scholar.google.com/citations?user=FMegj08AAAAJ&hl=en&oi=ao>

RECENT GRANTS AND GIFTS (total = \$3,706,272)

2021 Movements and population demography of pronghorn in western Oklahoma. Co-PIs: S. Fairbanks, M. C. Chitwood, and R. Lonsinger at OSU; G. Wang at East Central University; M. Cherry, E. Tanner, and R. DeYoung at Texas A&M Kingsville. Oklahoma Department of Wildlife Conservation. \$1,731,386; 5 years.

Wild turkey population dynamics and brood survival. Co-PIs: D. Elmore, M. C. Chitwood, C. Davis, and S. Fuhlendorf at OSU; R. DeYoung and E. Tanner at Texas A&M Kingsville. Oklahoma Department of Wildlife Conservation. \$1,350,758; 5 years.

Wetland and forest monitoring of USDA easements. Co-PIs: C. Davis, D. Elmore, and M. C. Chitwood. U.S. Department of Agriculture Natural Resources Conservation Service. \$120,000; 3 years.

TEACHING, MENTORING, AND SUPERVISION

Courses Taught (5)

2021 Wildlife Management Applications and Planning (NREM 4522, 5 students, 2 credits); Oklahoma State University; co-instructed with C. Duchardt

2020 Conservation of Wildlife Populations (WILD 470, 30 students, 4 credits); University of Montana; half of class taught via remote instruction due to COVID-19 pandemic

2019 Introduction to Biostatistics – Honors (WILD 240, 15 students, 3 credits); University of Montana

2017 Conservation of Wildlife Populations (WILD 470, 25 students, 4 credits); co-instructed lecture with J. J. Millspaugh; co-instructed 1-hr lab with A. C. Keever (TA); University of Montana.

2013 Piedmont Wildlife Ecology and Management (FW 311, 22 students, 3 credits); co-instructed with C. S. DePerno and M. A. Lashley as part of NCSU Wildlife Summer Camp.

Guest Lectures (40); Graduate Students Advised (2); Graduate Student Committees and Mentoring (6); Undergraduate Students Mentored (5); PROFESSIONAL PRESENTATIONS (80); Invited Presentations (17); Contributed Presentations (61)



Second Keynote

Integrated Management of Ecosystems with Special Attention to the Invasive Species

Wafaa M. Amer

Botany and Microbiology Department, Faculty of Science, Cairo University, Giza 12613, Egypt.
IUCN member; E-mail: wamer@sci.cu.edu.eg

Abstract

Integrated Ecosystem Management (IEM) comprises several activities (to cover soil, climate, biological elements, water...). This approach aims to improve the quality of the ecosystem-components and ensure their continuous service. These activities should be controlled by standard measurable criteria (details will be covered in this study). Among the drives that threaten the ecosystems are invasive species. The International Union for Conservation of Nature (IUCN) identified the Invasive Alien Species (IAS) as: an alien species which has been introduced outside its natural past or present distribution range; and has become problematic. IAS is now recognized as one of the greatest biological threats to our planet's environmental and economic well-being. Its eradication cost at least \$1.3 trillion from 1970 – 2017. It is covered by the strategic plan 2011-2020 in Aichi Target 9 (<https://www.cbd.int/sp/>). This item in the Arab region, including Egypt; needs sophisticated and comprehensive work by scientists in different disciplines, to identify, trace, and study its impacts over time on species/diversity, habitats/... The current work will cover the most dangerous 15 invasive species on Egyptian land (representing the Arab region). For each species introduction, the factors that led to its severe invasion and its negative effect on the ecosystem will be covered. The covered species are: four hydrophytes divided as two free floating (*Azolla filiculoides* and *Eichhornia crassipes*) and two rooted, namely: *Ludwigia stolonifera* and *Persicaria senegalensis*. One marine species (*Caulerpa taxifolia*) and five terrestrial species, namely: *Bassia indica*, *Bidens pilosa*, *Ipomoea carnea*, *Prosopis juliflora* and *Solanum elaeagnifolium*. In addition to five fauna species, they are grouped into four fresh water species, namely *Ctenopharyngodon idella*, *Gambusia affinis*, *Lates niloticus*, *Procambarus clarkii* and one insect species (*Rhynchophorus ferrugineus*). For each species: species name (family), vernacular names, species features and habitats, world geographical range, distribution range in Egypt, the negative impact of this species, references and representative photos were addressed.

Keywords: Integrated management, ecosystem, Invasive species, Egypt, Negative impact, Biodiversity.



Curriculum Vitae of First Key note lecture

Prof Dr. Wafaa Amer

**Professor of Taxonomy and Flora, Botany and Microbiology
Department, Faculty of Science, Cairo University.**

Current Job: Professor of Taxonomy and Flora, Botany and Microbiology Department, Faculty of Science, Cairo University.

Additional qualifications:

IUCN- Member (International Union for Conservation Nature)

UNESCO- Member in the National MAB committee.

Biodiversity and Environmental expert (League of Arab States)

Member of the Higher technical committee in Ministry of the Environment (EEAA)

Regional Peer Reviewer in Higher Education Institutions

Ex: Director of the Nature Conservation Sector (EEAA)"

Ex: Manager of "Science Heritage Center" Cairo University.

Ex: Head of; Botany & Microbiology Department Cairo University.

Ex: Creator of the Cairo University Herbarium.

Ex: Deputy of the Arab Federation for wildlife protection (LAS).

Ex: Manager of the Quality Assurance Unit, Faculty of Science.

- **Contact:** wamer@sci.cu.edu.eg and cellular: 002/ 01001099445; mail address: Botany and Microbiology Department, Faculty of Science, Cairo University; Giza 12613-Egypt.

https://www.researchgate.net/profile/Wafaa_Amer

- **Scientific qualifications:**

- Graduated with honor degree in 1982, Cairo University
- Doctorate in Plant Science (Flora & Taxonomy) in 1995.
- Professor of plant Science (Flora) in 2005.
- IUCN- Member; wild crop relative section to date of issue
- Publisher of 85 Scientific papers
- Participated in 55 national and international Conferences.
- Society membership: 10 GO's and 2 NGO's
- Thesis supervisor: 10 Ph. D's and 21 M. Sc. Theses
- Consultant in the field of biodiversity for the Ministry of Environment and several national/international institutions.

- **Work for international organizations:**

United Nations Educational, Scientific and Cultural Organization (UNESCO) Food and Agriculture Organization (FAO) United Nations Development Programme (UNDP); UN Environment Programme (UNEP); United Nations Economic and Social Commission for Western Asia (UN-ESCWA); International Union for Conservation of Nature (IUCN); Arab Organization for Agriculture Development- League of Arab States (AOAD-LAS); Nile Basin Initiatives (NBI).

- **Education Enhancement and Accreditation**

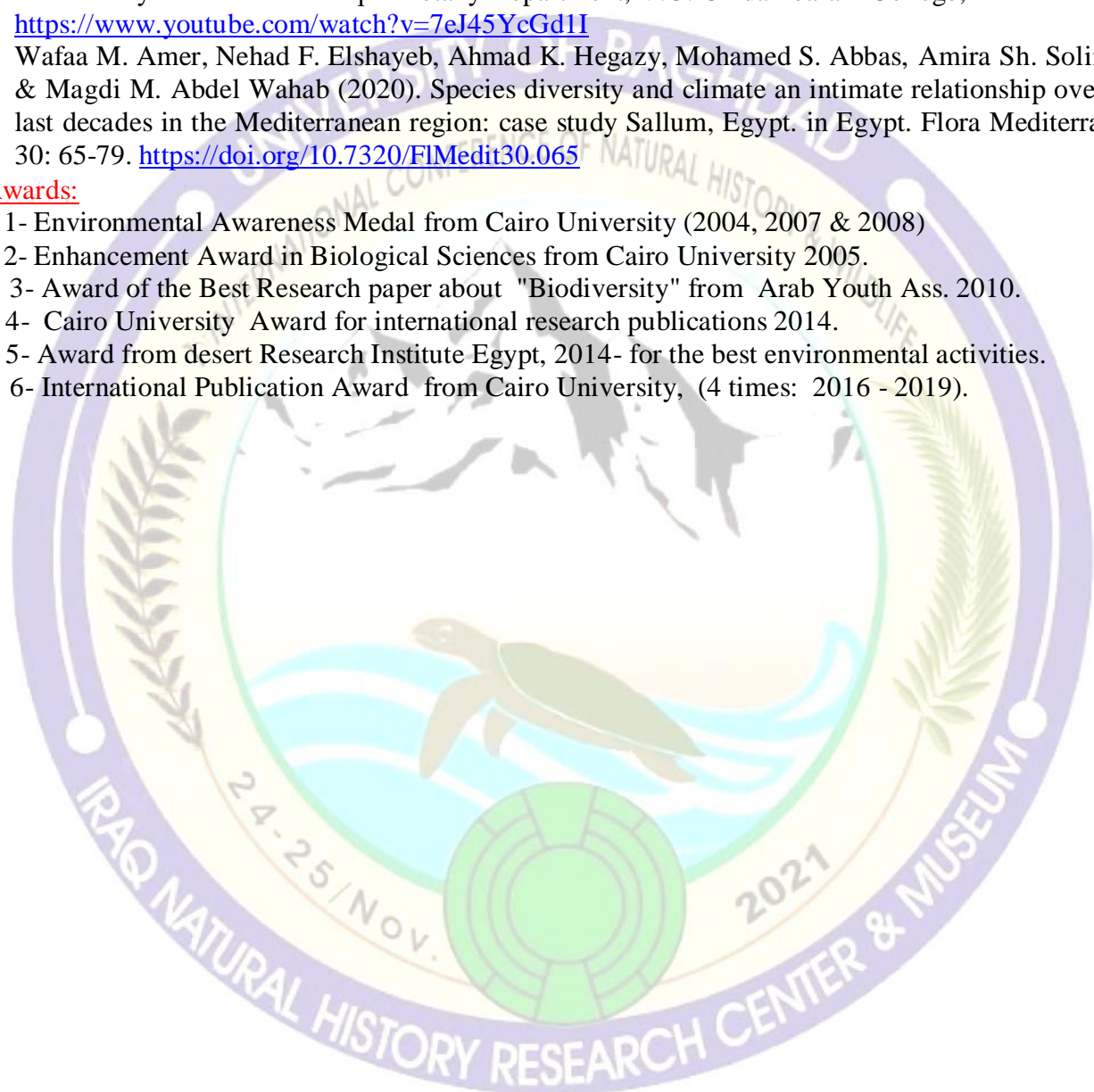
1. Member of the Egyptian Committee for Setting "National Academic Standards for the Basic Sciences Sector"



2. Participation in the arbitration / evaluation of proposals for quality / development projects from 2006 until now
 3. Participation in evaluating study programs in Egyptian and Arab universities.
- **Author and participant author in the following scientific books.**
 1. Atlas of trees and flowers of Maadi District” Cairo, 2002
 2. Principals of plant science, Part 1 (Arabic text book), Cairo 2005
 3. Principals of plant science, Part 2 (Arabic text book), Cairo 2008
 4. Amer, Wafaa.; Ashong, S. and Tiomoko, D. (2015). Management manual for African Biosphere Reserves . German commission for UNESCO. PP. 186.
https://www.unesco.de/sites/default/files/2018-01/Manual_BR_Africa_en-1.pdf
 5. Hamed, A.; Kord, M. and Amer, Wafaa (2015). Wild cotton in Egypt: Physiological and Molecular investigations of wild cotton. LAMBERT Academic Publications, Germany. Pp. 133. <http://www.cropwildrelatives.org/resources/publications/publication-detail/wild-cotton-in-egypt-physiological-and-molecular-investigations-of-wild-cotton/>
 6. Amer, Wafaa, Soliman, A. and Hassan, W. (2016). Floristic studies of riverian islands in Egypt. LAMBERT Academic Publications, Germany. Pp. 152.
<https://www.morebooks.de/store/gb/book/floristic-studies-of-riverian-islands-in-egypt/isbn/978-3-659-92751-5>
 7. Amer, Wafaa and Sallam, A. (2016). Biosystematic revision of genus *Atriplex* L. in Egypt . LAMBERT Academic Publications, Germany. Pp. 181.
<https://www.morebooks.de/store/gb/book/bio-systematic-revision-of-genus-atriplex-l-in-egypt/isbn/978-3-659-90324-3>
 8. Hassan, R.; Amer, Wafaa and ElHadidi, A. (2016). Flowering strategies in *Ochradenus baccatus* a gynodioecious species. LAMBERT Academic Publications, Germany. Pp. 161.
<https://www.morebooks.de/store/gb/book/flowering-strategies-in-ochradenus-baccatus,-a-gynodioecious-species/isbn/978-3-659-88099-5>
 9. Wafaa Amer (2018). Global Biodiversity APP Press, Vol 3,
<http://appleacademicpress.com/global-biodiversity-volume-3-selected-countries-in-africa/9781771887229>
 10. Amer W.M., Elshayeb N.F. (2020) Long-Term Species Diversity and Climate Change: An Intimate Relationship Over the Last Ten Decades – Case Study in Egypt. In: Leal Filho W., Luetz J., Ayal D. (eds) Handbook of Climate Change Management. Springer, Cham.
http://doi-org-443.webvpn.fjmu.edu.cn/10.1007/978-3-030-22759-3_103-1
 - **The recent publication**
 1. Wafaa M. Amer 2021. Biodiversity Utilization to Overcome the Global Food and Medicine Insecurity Webinar, Cairo, 1Feb. 2021,
<https://drive.google.com/file/d/1oZyuMRa8XKREgnaMSYkVgYlQfV52oYN8/view?usp=sharing>
 2. Amer, W. 2021. The Worst invasive species to Egypt 2021. In: Invasive Alien Species: Observation and Issues from Around the World; first Edition edited by T. Pillaiyah and Michael R. Lelmini. John Wiely & Sons LTD. P 1-28.
 3. Amer W.M., Elshayeb N.F. (2020) Long-Term Species Diversity and Climate Change: An Intimate Relationship Over the Last Ten Decades – Case Study in Egypt. In: Leal Filho W., Luetz J., Ayal D. (eds) Handbook of Climate Change Management. Springer, Cham. Pp.1-24.
http://doi-org-443.webvpn.fjmu.edu.cn/10.1007/978-3-030-22759-3_103-1
 4. Abd Elhameed A., Amer W., Azmy W, and Aboelil A. 2020. Auto-taxonomy of *Brassica tournefortii* Gouan. (Brassicaceae) in Egypt. Bangladesh J. of Plant Taxonomy. 27 (2): 233-250. doi.org/10.3329/bjpt.v27i2.50664



5. Azmy, W., Alshamrani, R., Amer, W. and Alsherif. 2020. Morphological, Molecular and Pollen Grain Investigations of *Salix* Species in Egypt. Baghdad Science Journal December 77-86. DOI: <http://dx.doi.org/10.21123/bsj.2021.18.1.0077>
 6. Amer, W, webinar lecture on 15 June 2020 entitled “Impact of climate change on biodiversity and world food security, organized by St. Joseph's College (Autonomous), Tiruchirappalli - 620002, Tamil Nadu, India. <https://youtu.be/zskawaoJ6XY>
 7. Amer, W, webinar lecture on 4 Sept. 2020 entitled: “Biodiversity and Climate Change: An Intimate Dynamic Relationship” Botany Department, V.O. Chidambaram College, <https://www.youtube.com/watch?v=7eJ45YcGdII>
 8. Wafaa M. Amer, Nehad F. Elshayeb, Ahmad K. Hegazy, Mohamed S. Abbas, Amira Sh. Soliman, & Magdi M. Abdel Wahab (2020). Species diversity and climate an intimate relationship over the last decades in the Mediterranean region: case study Sallum, Egypt. in Egypt. Flora Mediterranea. 30: 65-79. <https://doi.org/10.7320/FIMedit30.065>
- **Awards:**
- 1- Environmental Awareness Medal from Cairo University (2004, 2007 & 2008)
 - 2- Enhancement Award in Biological Sciences from Cairo University 2005.
 - 3- Award of the Best Research paper about "Biodiversity" from Arab Youth Ass. 2010.
 - 4- Cairo University Award for international research publications 2014.
 - 5- Award from desert Research Institute Egypt, 2014- for the best environmental activities.
 - 6- International Publication Award from Cairo University, (4 times: 2016 - 2019).







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First Record of the land snail *Polygyra cereolus* (Megerle von Muhlfield, 1816) (Gastropoda, Polygyridae) for Iraqi molluscan fauna

Hiba Mohammed Jihad, Hayder Badri Ali*

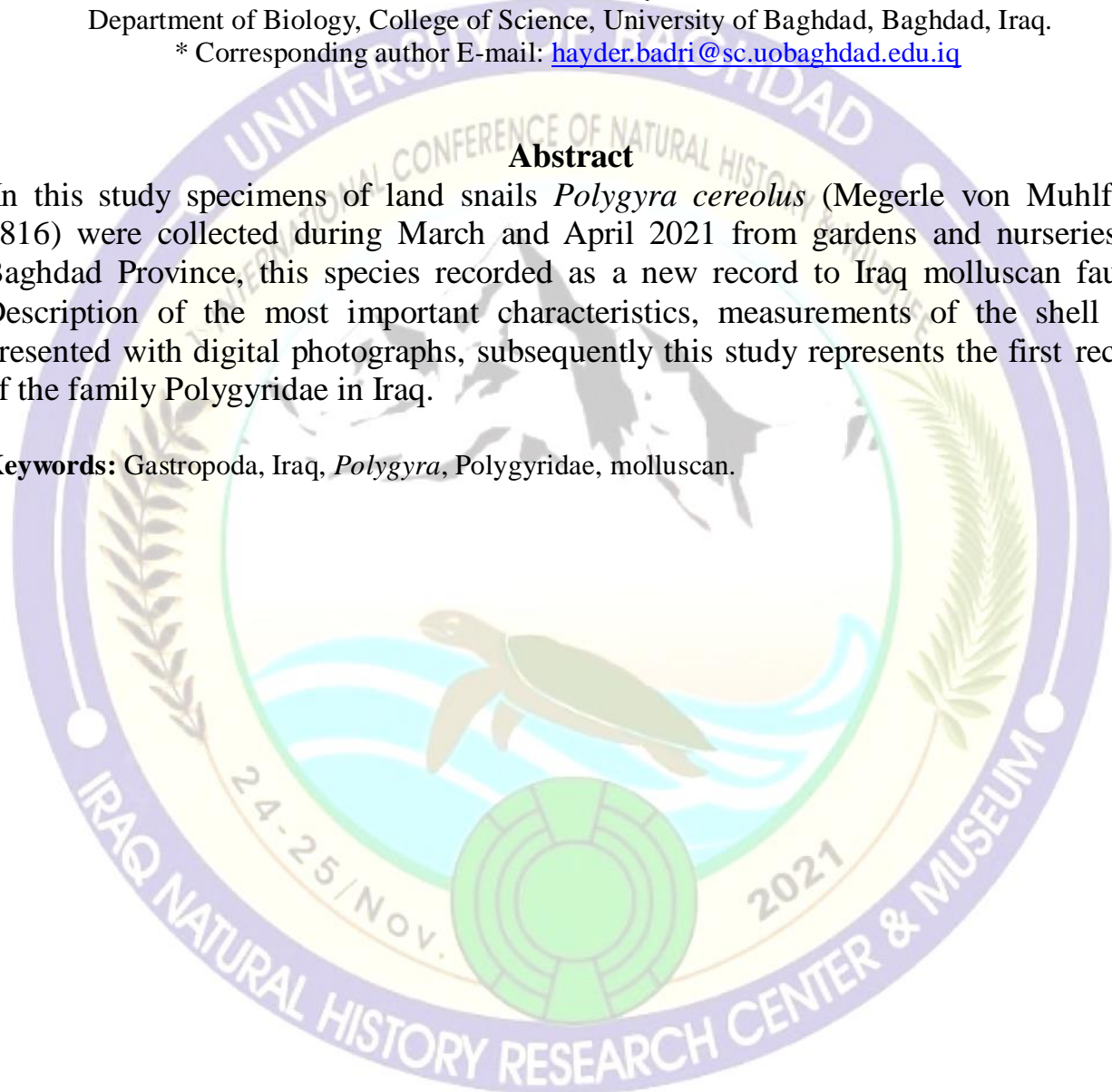
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Abstract

In this study specimens of land snails *Polygyra cereolus* (Megerle von Muhlfield, 1816) were collected during March and April 2021 from gardens and nurseries in Baghdad Province, this species recorded as a new record to Iraq molluscan fauna. Description of the most important characteristics, measurements of the shell are presented with digital photographs, subsequently this study represents the first record of the family Polygyridae in Iraq.

Keywords: Gastropoda, Iraq, *Polygyra*, Polygyridae, molluscan.





ICNHW2021 FIRST INTERNATIONAL CONFERENCE OF NATURAL HISTORY & WILDLIFE

First record of *Colletteichthys occidentalis* Greenfield, 2021 (Pisces, Batrochoidiformes, Batrochoididae) and *Polydactylus mullani* (Hora, 1926) (Carangiformes, Polynemidae) from marine waters of Iraq

Atheer H. Ali*, Ali A. Al-Darwesh and Jawad A. Mizher

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Abstract

During ichthyological survey in the Iraqi territorial marine water November 2019 till October 2020, two interest species of marine fishes were recorded, Arabian toadfish *Colletteichthys occidentalis* Greenfield, 2012 (Batrochoidiformes, Batrochoididae) and Arabian blackspot threadfin *Polydactylus mullani* (Hora, 1926) (Carangiformes, Polynemidae). A total of four and ten specimens of Arabian toadfish and Arabian blackspot threadfin fish respectively. *C. occidentalis* can distinguish from other toad fish in the region, *C. dussumieri* (Valenciennes 1837) by having single tentacle above the eye (two or three in *C. dussumieri*) and 22-24 rays in the pectoral fin (20 in *C. dussumieri*). *P. mullani* can distinguish from other threadfin fish in Iraq *P. sextarius* (Bloch & Schneider, 1801) by possessing seven pectoral filaments (six in *P. sextarius*) greater number of gill rakers 31-34 (25-30 in *P. sextarius*). The current record of both fish species considered the first in Iraq, while occurrence of *P. mullani* is the first in Arabian Gulf.

Keywords: Fishes, Iraq, Marine, Toadfish, Threadfin.



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***Stachys omranica* (Lamiaceae): A new taxa in Iraq**

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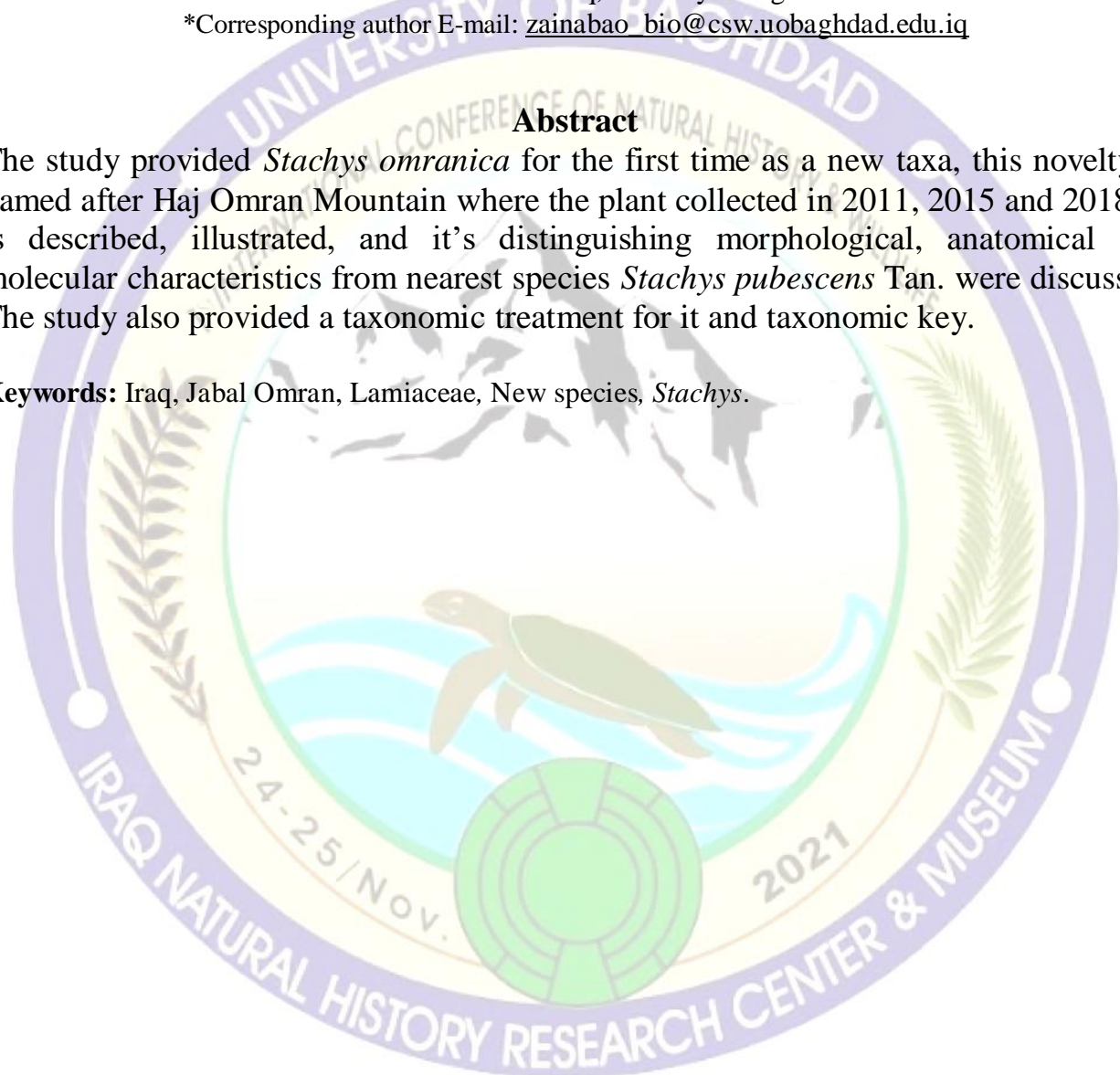
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Abstract

The study provided *Stachys omranica* for the first time as a new taxa, this novelty is named after Haj Omran Mountain where the plant collected in 2011, 2015 and 2018. It is described, illustrated, and it's distinguishing morphological, anatomical and molecular characteristics from nearest species *Stachys pubescens* Tan. were discussed. The study also provided a taxonomic treatment for it and taxonomic key.

Keywords: Iraq, Jabal Omran, Lamiaceae, New species, *Stachys*.





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A Taxonomical Study of *Carissa macrocarpa* (Eckl.) A.DC (Apocynaceae) in Iraq

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Abstract

The current study looks at a number of standardized factors, such as morphological, anatomical, and chemical features, that may be useful in identifying *Carissa macrocarpa* (Eckl.) A. DC. In terms of microscopical characteristics, *Carissa macrocarpa* is distinguished by the presence of calcium oxalate crystals in almost all parts of the plant. The phenotypic study included a study of the quantitative and qualitative characteristics of each root, stem, leaf, flower, fruit and seed. It extracted several interesting characteristics that distinguish *C. macrocarpa* from the rest of the genus *Carissa*, as well as from the rest of the species belonging to the Apocynaceae, including the presence of hard thorns spread along the length of the plant, which takes the defensive method as well as the aestivation method by turning the petals lobes towards the left, as well as the length of the petals compared to the petal tube, which is one of the important diagnostic characteristics and was developed as a key to diagnosing the species belonging to the mentioned genus. As for the anatomical aspect, the characteristics of the upper and lower epidermis of the leaf, the floral parts and the epidermis of the stem were measured and described, as well as the transverse sections of each of the leaves and their peduncle and stem, as well as the study of the venation system in the leaf. It was found that many of these traits are important in diagnosing the species, as it was distinguished by having leaves of the hypostomatic type, and the transverse section of the monofacial leaf.

The study also dealt with the chemical content of the methanol extract of the leaf, where the compounds were diagnosed using Gas Chromatography-Mass Spectrometry (GC-MS), It was found that eight chemical compounds are resulting from secondary metabolism, which have an effective role in medical treatments and as a defense mechanism for plants, the most important of which is the glycoside compound. α -d-6,3-Furanose,methyl- β -d-glucohexodialdo-1,4-furanoside, which occupied the highest percentage of approximately 92.83% of the total percentage of the area of peaks.

Keywords: Apocynaceae, *Carissa*, Iraq, Taxonomical, hypostomatic.



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Identification of Two Species from the Genus *Chrysobothris* Eschscholtz, 1829 (Coleoptera, Buprestidae) Based on Larval Morphology and Molecular Technique

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Abstract

The genus *Chrysobothris* Eschscholtz, 1829 is one of the most diverse and widespread genera of the family Buprestidae of some 700 described species distributed throughout the world. In Iraq, particularly in the Kurdistan Region, about 4 species had been recorded so far, many of these species are sympatric, share larval host plants, and are difficult to reliably separate morphologically. This study investigated species limits and relationships among the recognized species occurring within the Erbil province. Results are presented from molecular analyses involving sequences from cytochrome oxidase I (cox I). Cox I analyses confirmed the monophyly of two *Chrysobothris* species, *Ch. parvipunctata* Obenberger, 1914, and *Ch. chrysostigma* Linnaeus, 1758. Implications of the resultant larval morphology and molecular techniques are discussed. Morphological characteristics that are depended to identification species within the genus *Chrysobothris* were used and then compared with the molecular data.

Keywords: Buprestidae, *Chrysobothris*, Coleoptera, Molecular, Morphology.





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Morphology Study and Some Biological Aspects of *Lampetis mimosae* (Klug, 1829) (Buprestidae, Coleoptera) in Basrah Province, Iraq

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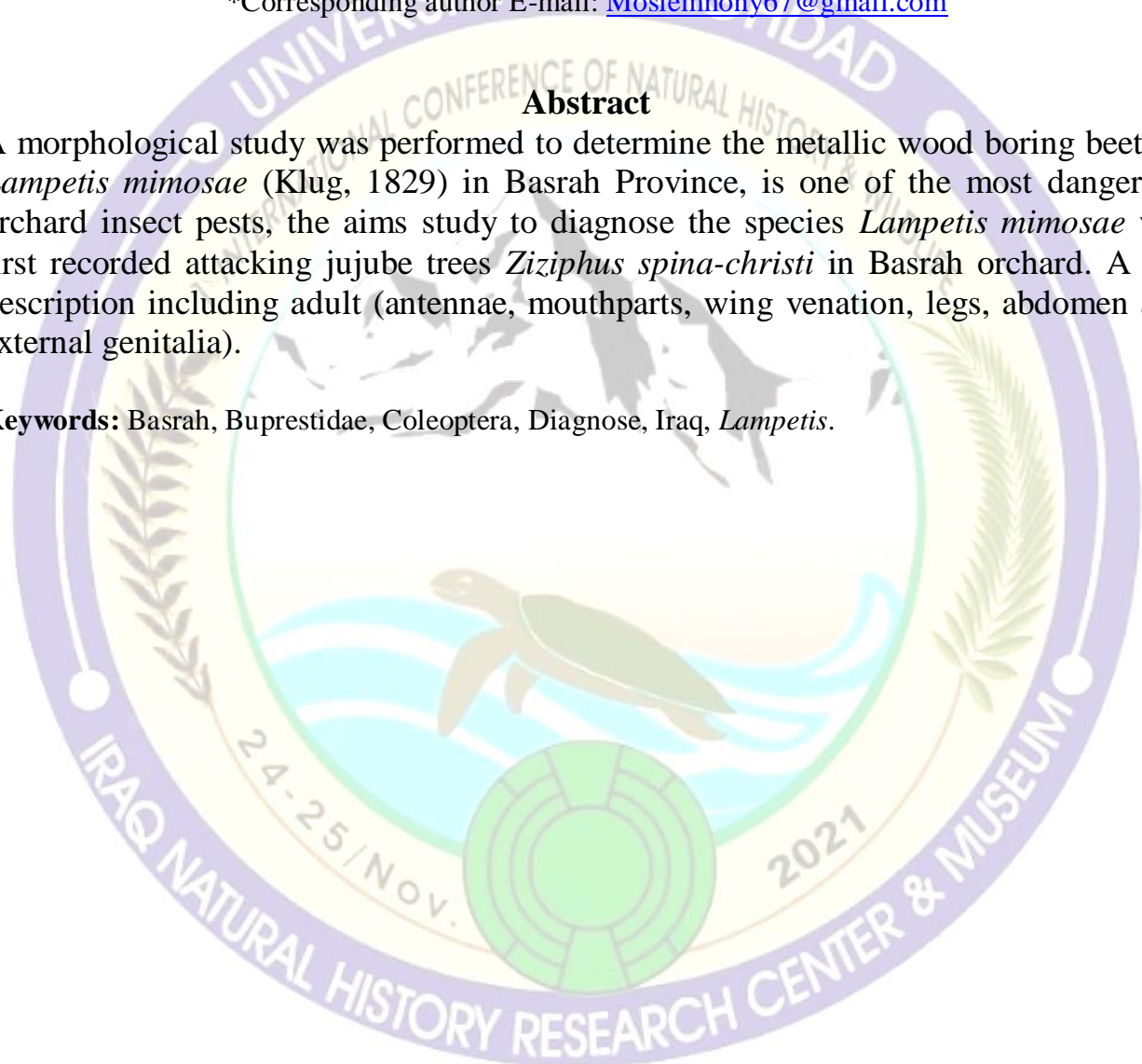
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Abstract

A morphological study was performed to determine the metallic wood boring beetles, *Lampetis mimosae* (Klug, 1829) in Basrah Province, is one of the most dangerous orchard insect pests, the aims study to diagnose the species *Lampetis mimosae* was first recorded attacking jujube trees *Ziziphus spina-christi* in Basrah orchard. A full description including adult (antennae, mouthparts, wing venation, legs, abdomen and external genitalia).

Keywords: Basrah, Buprestidae, Coleoptera, Diagnose, Iraq, *Lampetis*.





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First Record of Silver Tripod Fish *Triacanthus nieuhofii* Bleeker, 1852 (Tetradontiformes, Triacanthidae) from Eastern Hammar Marsh, Southern Iraq

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Abstract

A total of 18 specimens of Silver tripodfish *Triacanthus nieuhofii* Bleeker, 1852 (37-63 mm in standard length) were caught from Al-Sallal Creek (between Al-Hammar marsh and Shatt Al-Arab river), Basrah, southern Iraq during August 2018 at the period of a salt water intrusion (16.3 PSU). *T. nieuhofii* can distinguished from *Triacanthus biaculeatus* (Bloch, 1786) the only species known from the genus in Arabian Gulf by longer first dorsal spine, bigger eye diameter, deeper body and the outline of head between base of first dorsal-fin spine and eyes somewhat straight or slightly concave over eye (straight in *T. biaculeatus*), many yellow blotches on the silver background body (no blotches). The taxonomic problems to distinguishing between *Triacanthus* and *Pseudotriacanthus* Fraser-Brunner, 1941 in Iraq were given.

Keywords: Iraq, Marsh, Tripod, Triacanthidae, Tetradontiformes



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***Atheta basraiensis* sp. nov. (Coleoptera, Staphylinidae) from Iraq**

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Abstract

Atheta (Microdota) basraiensis sp. nov. is described and illustrated from Basrah Province, South of Iraq. Male and female habitus, as well as, male and female genitalia, together with other important taxonomic characters are all illustrated. Comparing between this species and others very closed to it, were discussed.

Keywords: *Atheta*, Basrah, Coleoptera, Staphylinidae, Iraq





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Morphological Study of Two New Species of the Genus *Lixus* Fabricius, 1802 (Coleoptera, Curculionidae, Lixinae) Form Iraq

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Abstract

This research includes morphological study of two species of the genus *Lixus* Fabricius, 1801 are newly recorded for the Iraqi entomofauna. The new species are described and illustrated in details. Most important diagnostic and taxonomic characters are presented in comparison between both species. The distribution, locality, date, collection methods and host plant of new species have been given.

Keywords: Curculionidae, Iraq, *Lixus*, Morphological description, New records.





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Short Notes About the first Record of *Dugesia tigrina* (Girard, 1850) (Tricladida, Dugesiidae) in Iraq

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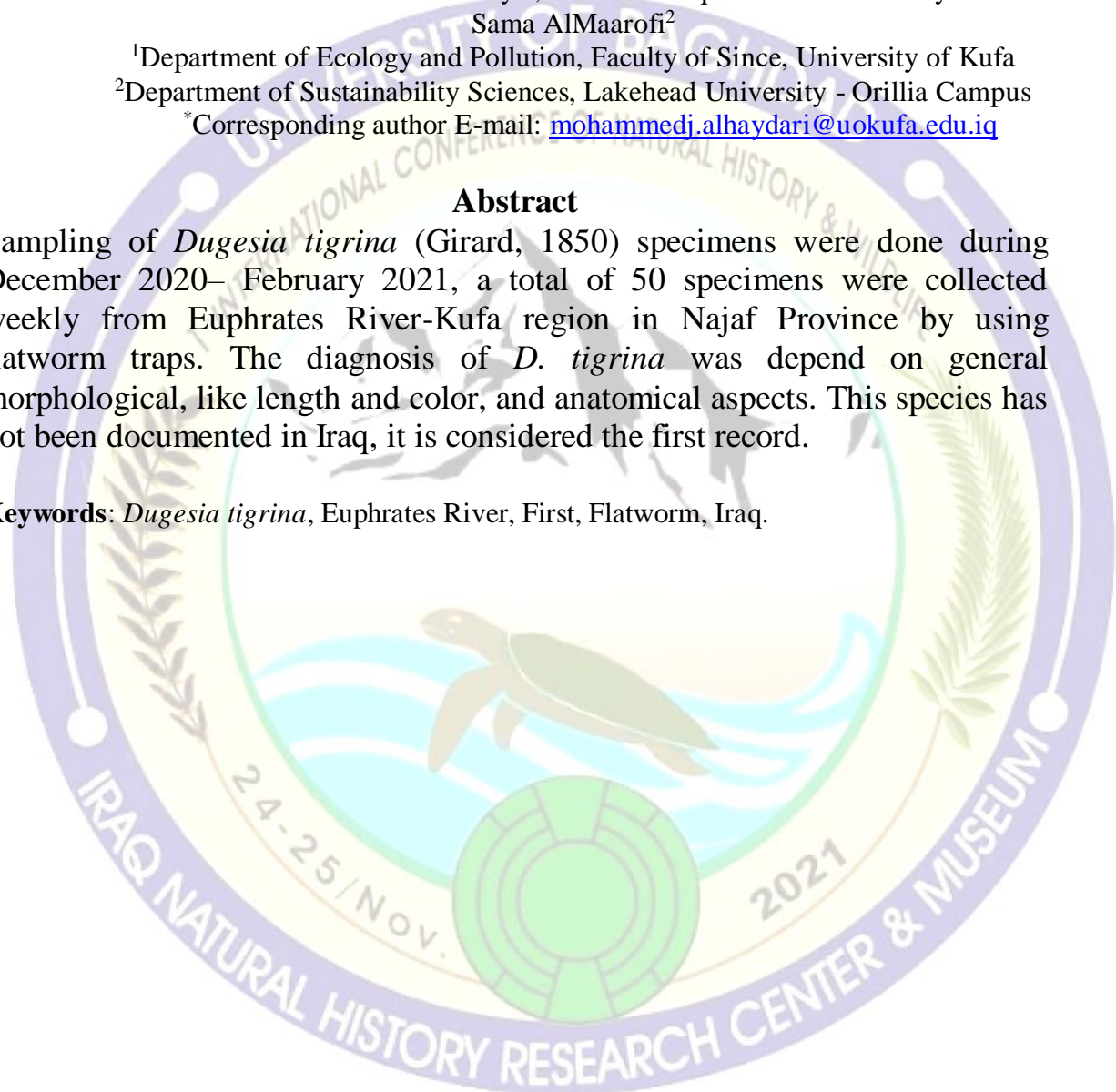
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Abstract

Sampling of *Dugesia tigrina* (Girard, 1850) specimens were done during December 2020– February 2021, a total of 50 specimens were collected weekly from Euphrates River-Kufa region in Najaf Province by using flatworm traps. The diagnosis of *D. tigrina* was depend on general morphological, like length and color, and anatomical aspects. This species has not been documented in Iraq, it is considered the first record.

Keywords: *Dugesia tigrina*, Euphrates River, First, Flatworm, Iraq.





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Poster

New Record of Ground Beetles, *Chlaenius hamifer* Chaudoir, 1856 (Coleoptera, Carabidae) in Iraq

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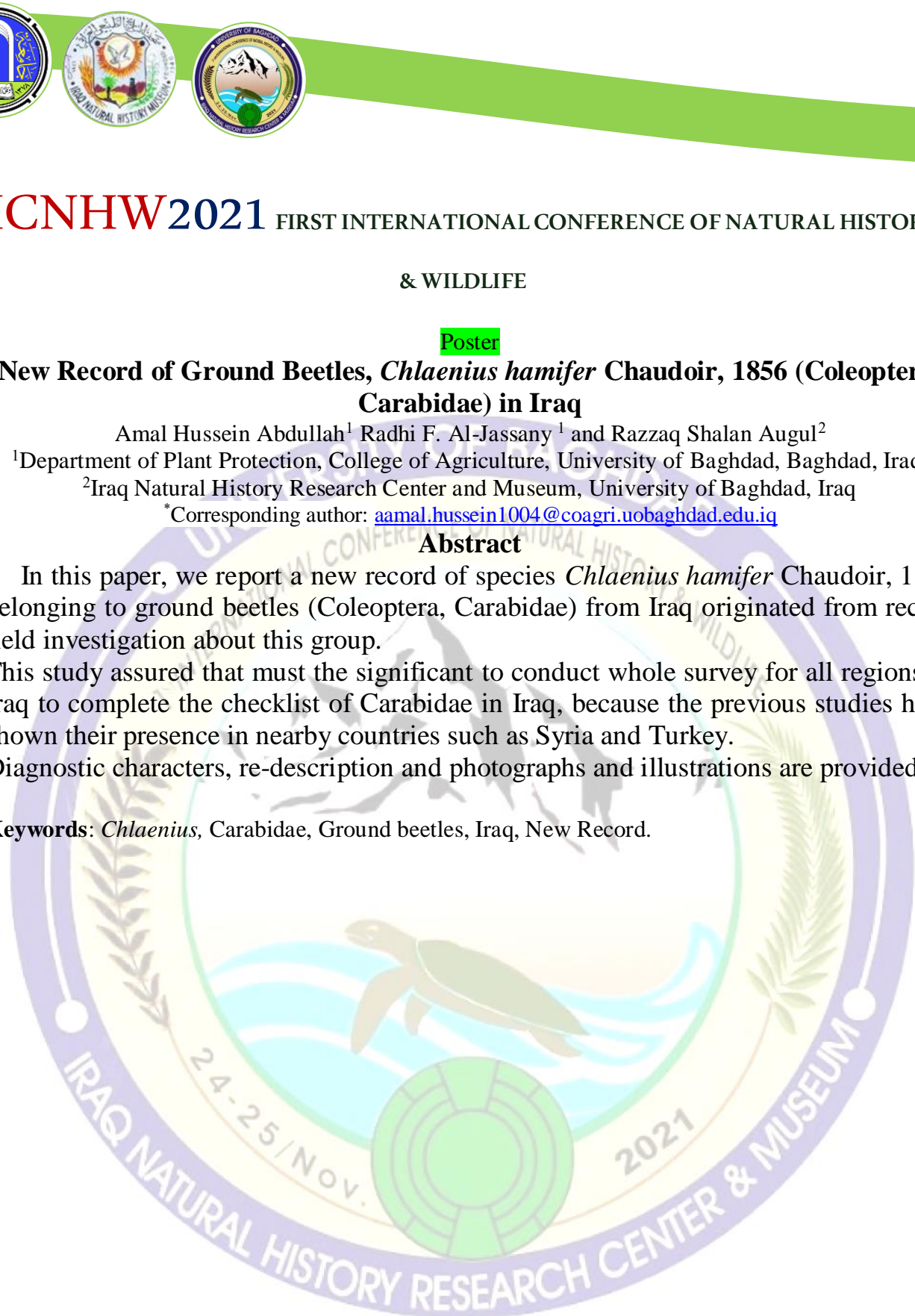
Abstract

In this paper, we report a new record of species *Chlaenius hamifer* Chaudoir, 1856 belonging to ground beetles (Coleoptera, Carabidae) from Iraq originated from recent field investigation about this group.

This study assured that must the significant to conduct whole survey for all regions of Iraq to complete the checklist of Carabidae in Iraq, because the previous studies have shown their presence in nearby countries such as Syria and Turkey.

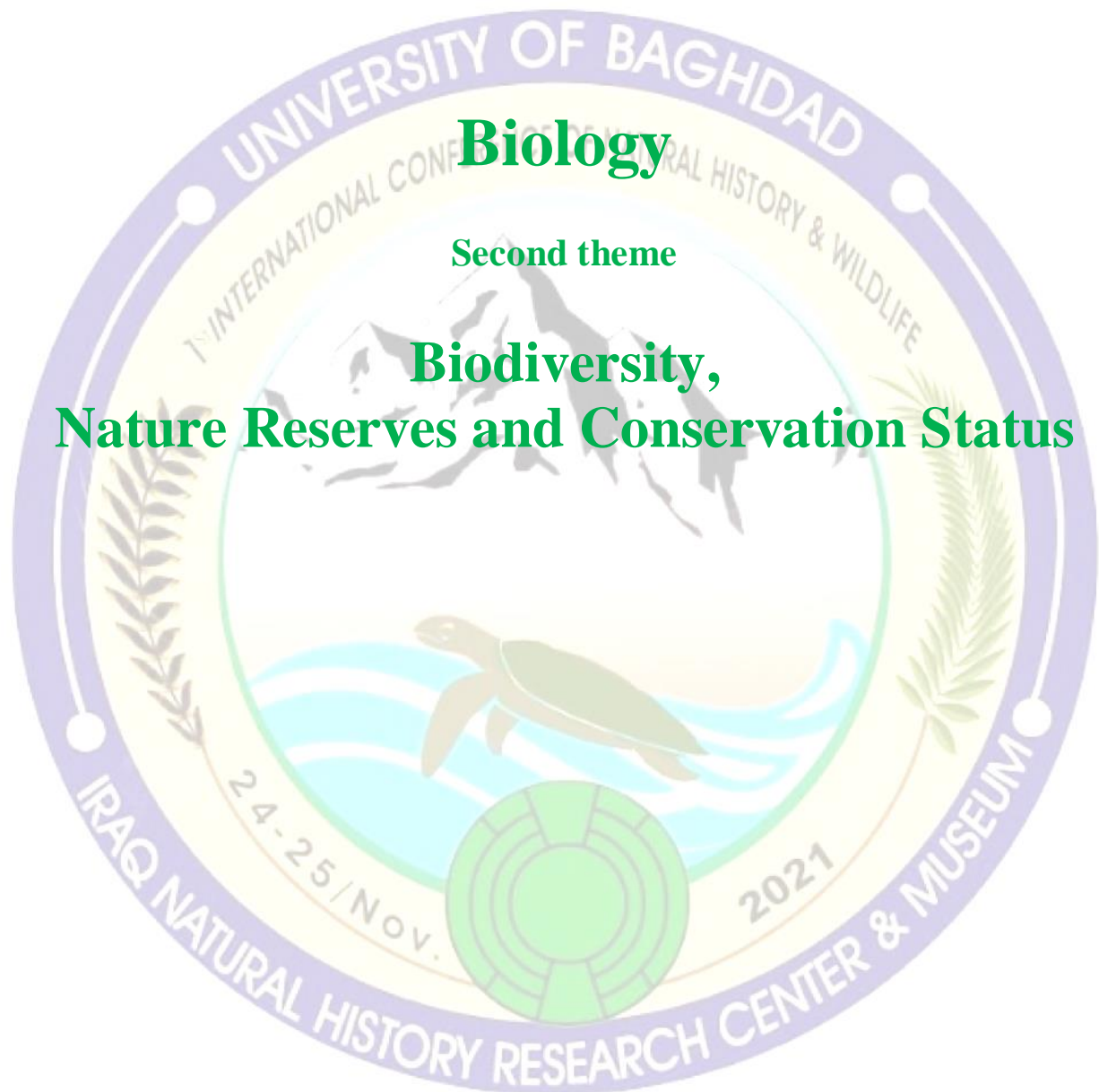
Diagnostic characters, re-description and photographs and illustrations are provided.

Keywords: *Chlaenius*, Carabidae, Ground beetles, Iraq, New Record.





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Soil Fungi Diversity in Some Soils of Hilla City, Iraq

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Abstract

This study was carried out to investigate the relationship between different soil properties and fungal diversity using various diversity indices. The soil samples were collected from five sites in different locations in the south of the Hillah city and examined for physical, chemical and biological analyses. The identification of the isolated fungi was carried out via both macroscopically as well as microscopically methods. The fungal diversity was detected in soils by applying different diversity indices (Shannon and Wiener, Simpson, Margalef, Menhinick, Buzas-Gibson's and Berger- Parker).

The results showed that the fungal isolates were belonged to 20 species under 9 genera and the most dominant genera in all soils were *Aspergillus* species. Consequently, the highest counts of fungi per gram of soil the greatest diversity whilst the contrary result was observed at soil that having the lowest count of fungal population.

Keywords: *Aspergillus*, Diversity, Fungi, Hilla, Soil.



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A Survey of Land Snails in NE Libya

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Abstract

This reconnaissance study is based on land snail shells collected during several field visits to some parts of northern Libya, from which twenty-four species have been identified and illustrated. Systematically, they classified into nine families of subclass Pulmonata, these are Orculidae, Enidae, Subulinidae, Zonitidae, Clausiliidae, Sphincterochilidae, Ferussaciidae, Helcidae and Physidae, the later one is fresh water; in addition to Cyclophoridae family which is belonging to the subclass Mesogastropoda. Generally, the most abundant genera are *Helix*, *Trochoidea*, *Rumina*, and *Barcania*. The peculiar presence of *Helix aspersa* at Cyrene and *Eobania vermiculata* at Apollonia and *Leptis Magna* is strongly attributed to the introduction by the ancient Romans. *Orcula radiaensis n. sp.* is proposed herein to be a new species. It has been retrieved in association with a small sized shells at karstified doline located close to Marad Radiah in Qasr Libya.

The geographical distribution of the reported land snails in Cyrenaica is mostly associated with the dry Mediterranean climate in the coastal areas, the high topographic relief areas and the calcareous soil type are also considered. While, in the dry and arid region (e.g. desert) snail are completely absent. Therefore, the climate is suggested to be the main element of their recession geographically. Conclusively, most of the documented species are of Circum-Mediterranean range. *Trochoidea gharlapsi*, *Cochlicella acuta* and *Paramastus cf. edentates* are considered herein as four threatened species from Libya.

Keywords: *Helix*, Libya, Mesogastropoda, Pulmonata, Snails.



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Effect of Tharthar Arm Water on Composition and Diversity of Copepoda in Tigris River Northern of Baghdad City, Iraq

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Abstract

This study considered the first on this sector of Tigris River after 2003, to evaluate the effect of Tharthar Arm on the composition and diversity of Copepoda in Tigris River. Six sampling sites were selected, two on Tharthar Arm and four along Tigris River, one before the confluence as a control site and the others downstream the confluence. We identified 35 taxa for Copepoda 34 taxa in Tigris River and 25 taxa in Tharthar Arm. The results showed that high density of Copepoda in Tharthar Arm increased Copepoda density in Tigris River from 63878.2 Ind./m³ before the confluence to 127198.3 Ind./m³ at immediately downstream the confluence. Also, the mean values of richness index and diversity index increased from 1.71 and 0.98 bit/Ind. before the confluence to 2.08 and 1.00 bit/Ind. below the confluence, respectively. Moreover, the highest similarity value was between sites 3 with 4 reached 87.83% while, the lowest value was between sites 1 with 2 recorded 65.41%. For constancy index the highest value was 9 in site 6 and the lowest value was 2 in site3.

Keywords: Biodiversity, Copepoda, River Confluences, Tigris River, Tharthar Arm.



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& WILDLIFE

Overhunting and its Impact on the Wildlife Environment and Sustainable Hunting in Iraq

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Abstract

Iraq has wild animal wealth that does not exist in many countries, for this reason, the study addressed an important topic on how to reduce overhunting and spread a culture of sustainable hunting in Iraq, the study also showed Iraq's lack of controls regulating hunting, although the presence of law 17 for the year 2010, which has many paragraphs for regulating the hunt in the country, but still not active. , the study also clarified, no official institution in the country has adopted the awareness of citizens, about the need to practice sustainable hunting and not to use unauthorized hunting methods against wildlife, the study also cleared that the Iraqi Hunters Association, since its establishment in 1983, the establishment of controls for sustainable hunting in coordination with the Ministry of Agriculture, regarding the controls for obtaining a hunting license, and with the Ministry of Interior for, checkpoints about violates hunters, but the agreement has not yet been implemented (Abdulrazzaq, 2008). The Iraqi Hunters Association also held conferences, seminars, and educational courses, to educate citizens in general, and its members, in all media about the concept of overhunting, and sustainable hunting, as well as open educational courses for its members, about how to use hunting weapons, and the ammunition. The study also clarified the decrease birds, which present formerly, and highlight, the statistical data, and the charts, that show this deficiency, and the study highlight in the recommendation, the spread of false hunting associations, and the spread of shops selling weapons, and ammunition, throughout Iraq, contributed to the increase the overhunting, of local birds and animals, The study also recommended, the cooperation of the relevant official ministries, with the Iraqi Hunters Association, to work to prevent overhunting, and impose penalties, of deterring for violating hunters, and achieving a natural balance for wildlife, by educating citizens, to preserve the environment and wildlife in our dear country, contributing to the establishment of natural reserves, for the breeding of rare animals and birds to restoring the natural balance of this wealth.

Keywords: Environment, Iraq, Overhunting, Sustainable Hunting, Wildlife.



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(Poster)

Odonata in Basrah Province- South of Iraq

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Abstract

A twenty terrestrial species of two Suborders Anisoptera and Zygoptera (Order: Odonata) were recorded from different locations of Basra Province for the period from December 2017 to November 2018. The identified specimens include, one genus in the Coenagrionidae family, two genera in Aeshnidae family and four genera in the Libellulidae family. Observation for damselflies and dragonflies' numbers, appearance times were presented and the status of biodiversity were assessed using the Red list of IUCN. Most of record species were least concern, while *Brachythemis fuscopilliata* Selys, 1887 was found to be threatened.

Keywords: Anisoptera, Basrah, Iraq, Odonata, Zygoptera.





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RAPD Analysis as a Reliable Tool for Detection of Biodiversity in Iraq

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Abstract

RAPD (random amplified polymorphic DNA) is a PCR-based method for detecting genetic variation. It entails using a single arbitrary primer in a PCR process, leading in the amplification of a large number of distinct DNA products, for this purpose, two fish species *Tilapia zilli* Gervais, 1848 and *Aspius vorax* Heckle, 1843 were chosen to identify the genetic variation from three sites on Al-Hilla River, the results showed that at amplicon levels, the 25 primers showed the most intra-species variance (100 percent polymorphism) for *T. zilli*; Despite their physical similarities. The two species have a few of genetic differences among the fish species discrimination, polymorphism was discovered to indicates the biodiversity; because there were species discrimination, the results indicated that the three RAPD bands are relevant for genetic diversity investigations of fish species.

Keywords: Biodiversity, Iraq, RAPD, *Aspius*, *Tilapia*.



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Comparative Anatomical and Histological Study of the Kidneys in two Euryhaline Teleostan Species *Heteropneustes fossilis* Bloch, 1794 and *Gambusia holbrooki* S. F. Baird & Girard, 1853

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Abstract

Fish differ in their ability to tolerate salinity, some of them live in salt water only, such as sea and ocean and others live in fresh water, such as the water of inland rivers and lakes, but there are some fish that live in both environments and are called salt tolerant fish, so this study was based on taking two species of teleostan fish with wide tolerance for salinity are *Heteropneustes fossilis* Bloch, 1794 and *Gambusia holbrooki* S. F. Baird & Girard, 1853. Macroscopic examination revealed that the kidneys of *H. fossilis* were long ribbon like and fused along their median edges, except for a small area situated at the end of anterior third where they separate. The cephalic ends of the kidneys protruded laterally. No renal portal system was found, in *G. holbrooki* on other hand, the two kidneys were small, short and triangular in shape and were separate from each other. A distinct renal portal system was evident renal corpuscles were randomly distributed throughout the kidneys of *H. fossilis*. They were, however, confined to the kidney margins in *G. holbrooki*. The central part of the kidney in the in the latter species was occupied by urinary tubules. This organization made the kidney of mosquito fish almost similar to that of higher vertebrates in having a cortex and a medulla. Glomeruli of *H. fossilis* were more abundant and smaller in size in comparison with *G. holbrooki*. In both species cells on inner layer of Bowman's capsule were modified into podocytes similar to those in mammal's kidneys of both species were composed of typical nephrons taking in consideration their component (renal corpuscle and urinary tubule consisted of six regions) and histological structure of these components. The ability to live in different saline environments due to the effect of the prolactin hormone on the renal glomeruli, where it works to increase or decrease the size of glomeruli under influence of salt, while the aldosterone hormone affects an increase or decrease in the diameters of the urinary tubules according to the salt concentration as well.

Keywords: *Gambusia*, *Heteropneustes*, Histological study, Kidney, Teleostine.



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Remarkable Species in Iraq's Herpetofauna

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Abstract

The amphibian and reptilian fauna of Iraq is diverse because the country consists of several drastically different ecoregions, ranging from dry shrub lands and true desert in the west and southwest through moist Mesopotamian lowlands until the high mountains of the Zagros mountain chain in the north and east. Some important herpetofaunistic records, in particular snakes, have been made in the past years in all three ecoregions mentioned, but due to the orographic differentiation of the landscape in northeastern and eastern Iraq, i.e. in the Autonomous Kurdistan region, species richness and endemism is highest. Some most remarkable herpetological collections and discoveries were made by the Russian zoologist Pavel Vladimirovich Nesterov (1883-1941) who in 1915 described one new genus *Rhithrotriton* and three new species of urodelan amphibians *Rh. derjugini*, *Rh. microspilotus* and *Salamandra semenovi* from the Kurdish part of Iraq and endemic to the western Zagros range. Additionally, he collected a new monitor lizard which, however, remained undescribed subsequently found- but not recognized in some places in neighboring Iran, it was identified and described only one century later and was named after its collector as *Varanus nesterovi*. In Iraq, it was rediscovered in 2017, and very recently further documentations could be made. Much genetic and ecological research is necessary to assess the exact phylogenetic position and also the conservation status of this remarkable big lizard.

Keywords: Herpetofauna, Iraq, *Salamandra*, *Rh.derjugini*, *Rh.microspilotus*



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Survey of Ladybird Beetles (Coccinellidae, Coleoptera) from Different Host Plants in Basrah Province, South of Iraq

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Abstract

The ladybirds which belonging to a family Coccinellidae are important predators that feed on insects, especially some agricultural pests. They play a vital role in biological control programs, and provide balance in the agricultural ecosystem. In view of the importance of these types of predators, the current research was conducted as a comprehensive survey for different regions of Basra province, the samples were collected using sweeping nets and hand collecting from the wetland environment east Hammar Marsh, desert lands Safwan and Al Zubair, and agricultural areas Shatt Al-Arab and Abu Al-Khasib; during the first of January till the first of June, 2021. During the study period, six species of ladybirds were recorded; belonging to six genera and from different plant families, the frequency rate of the species was as follows: *Coccinella septempunctata* (42.9%), *Coccinella novemontata* (23.1%), *Coccinella undecimpunctata* (13.5%), *Hippodamia tredecimpunctata* (10.5%), *Stethorus* spp. (7.6%) and *Harmonia* spp. (2.4%). The host plant of each species of insects; main preys and environmental conditions (temperature, relative humidity, and wind velocity) for each station of study were recorded.

Keywords: Basrah, Coleoptera, Coccinellidae, Iraq, Ladybird.



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Survey of the Some Southern Iraqi Marshes Insects

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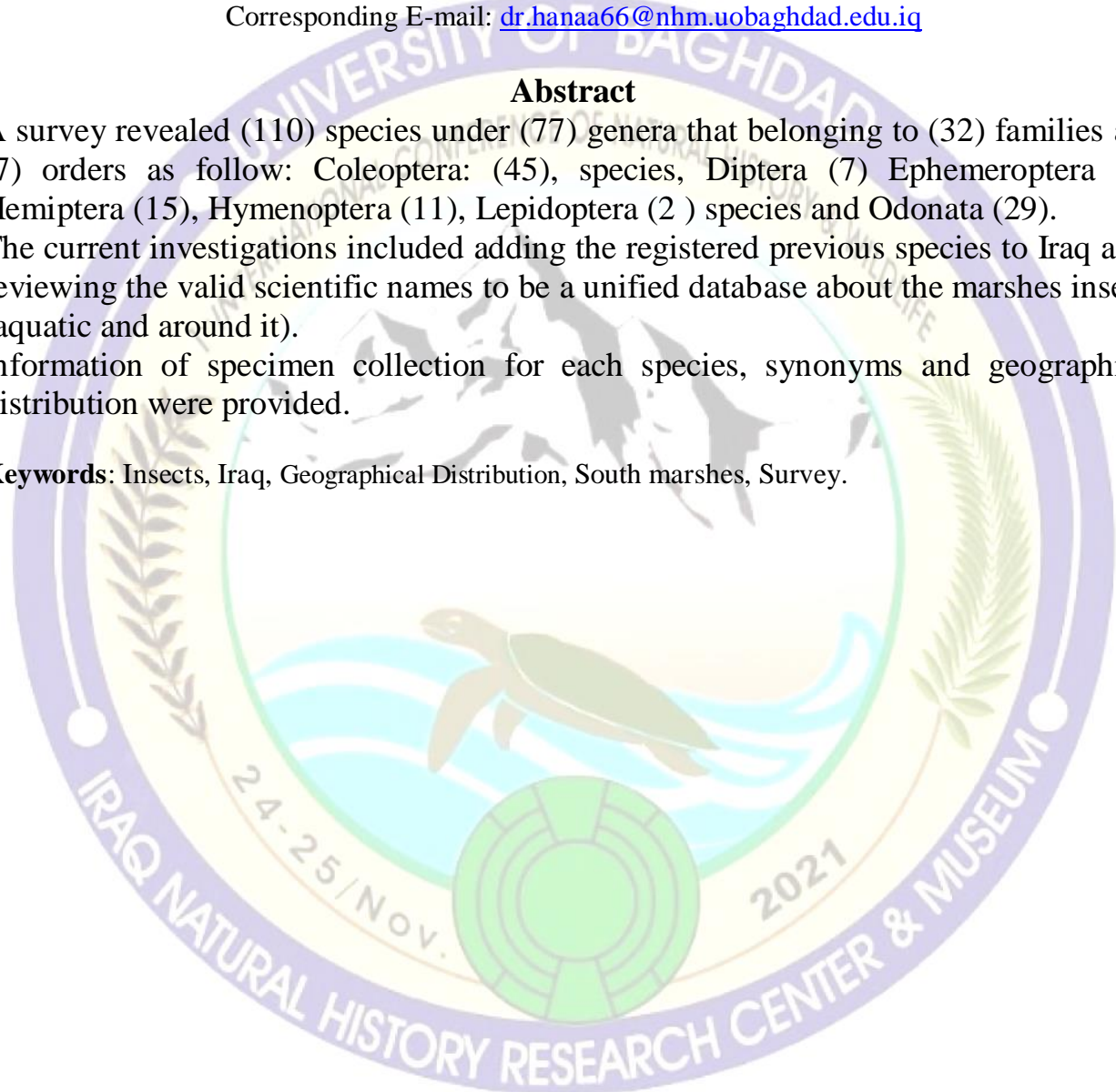
Abstract

A survey revealed (110) species under (77) genera that belonging to (32) families and (7) orders as follow: Coleoptera: (45), species, Diptera (7) Ephemeroptera (2), Hemiptera (15), Hymenoptera (11), Lepidoptera (2) species and Odonata (29).

The current investigations included adding the registered previous species to Iraq after reviewing the valid scientific names to be a unified database about the marshes insects (aquatic and around it).

Information of specimen collection for each species, synonyms and geographical distribution were provided.

Keywords: Insects, Iraq, Geographical Distribution, South marshes, Survey.





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New Approach to Assess Ecological Health of Shatt Al-Arab River

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Abstract

Shatt Al-Arab River, is the major aquatic habitat in the vicinity of Basrah Governorate in Southern Iraq and source of livelihood for the local inhabitants. The Shatt habitat included large number of macarophyte species, consequently, was selected to assess the river ecological health. A multi-index system has been applied to assess the ecological health, includes Water Quality Index according to Canadian Council of Ministers of the Environment (CCME WQI), Carlson Trophic Index (CTSI), Simpson diversity index (SDI), with comparison with Maraglef's richness Index, .The index indicates that the northern sector of Shatt is in good health (EHI range between 1.93and 2.08),while the other sections were in the medium status during the study period(EHI range between 2.1and 2.83), except the southern sector during the summer of 2018 .The value of EHI reached to 3.7 Therefore, suitable conservative measures is needed to be adopted to recover the good ecological health of the Shatt Al-Arab river

Keywords: Basrah, Ecological Health, Iraq, Macarophyte, Shatt Al-Arab.



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Determining Pollution Level for the Marine Environment Using the Pollution Load Index

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Abstract

Monitoring of marine ecosystem by a cost-effective and scientifically sound means is a goal to every country, however, in the context of biological monitoring or the so called Ecosystem Approach which means getting information in integrated manner or from more than one component of the marine ecosystem for assessing the effects of the anthropogenic influences on the marine environment. Monitoring programmes were always aimed to improve and protect the marine and coastal areas from degradation, pollution and reduce the causes of pollution to which it was exposed. On the basis of building on the assessment blocks for monitoring or the so called MDIAK which is mean Monitoring, Data, Indicators, Assessment and Knowledge. Based on this context the Pollution Load Index (PLI), has been applied using the data obtained from the analysis of water and algae. Algae and *Posidonia oceanica* were considered as good candidates among the different species selected by United Nations Environmental Programme (UNEP) in 2019 as one of the most important biota that could be an excellent tool for monitoring the marine environment particularly for the Mediterranean Sea. The concentrations of the metals (Zn, Pb, Cd and Cu) were measured in two marine green algae namely *Ulva* sp and *Enteromorpha* sp, that were collected from AL-sabri area, Juliana area, Eshbilla area and Benghazi port (Elmina) and all located along of Benghazi city Coastline during the winter and the summer seasons. The results of the PLI calculated showed that the values for *Enteromorpha* species were 1.2 indicating a polluted condition while PLI value for *Ulva* species were 3.3. With regard to site (Juliana area) the PLI value for *Ulva* species were found to be 4.1 indicating an acceptable condition while it was a clean condition for the *Enteromorpha* species at the same sites. The results of the remaining sites indicating a clean environment as all the PLI values. The results reflect that *Enteromorpha* species is a good accumulator of heavy metals and could be also a good candidate for monitoring the Libyan coastline. The results also show that the PLI index could be an important tool for the assessment of the marine environment.

Keywords: *Enteromorpha*, Libya, Marine, Pollution, *Ulva*.



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Investigation of Heavy Metals Pollution in Euphrates River (Iraq) by Using Heavy Metal Pollution Index Model

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Abstract

This study aims to investigate heavy metal pollution in the Euphrates River which is located from Al-Kifl city to Kufa city, in Iraq. We analyzed six heavy metal parameters (Cd, Pb, Zn, Cr, Fe, and Mn) in water, every month several samples were taken from six sites on the Euphrates River and covered the period of time from July 2020 to January 2021. The results of the heavy metal analysis were evaluated according to the maximum values given in Water Quality Regulation. The obtained outcome of the analysis revealed that cadmium values surpassed the limit values for sites 1 and 5. The overall pollution level of the heavy metal pollution index model appeared to be useful to assess with respect to heavy metals and the values were found higher than the critical pollution index value of 100 in site 1.

Keywords: Euphrates, Heavy metal, Iraq, Kufa, Pollution.



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Laser detection of Pollution

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Abstract

Laser is a device that emit light through a process of optical based on the stimulated emission of radiation. Laser is use to monitoring pollutants in water like Zn, Pb and Cad Cadmium); in air (CO₂, N₂ ...etc.) and solid spectroscopic analysis that is useful technique are reviewed; First was Long- path measurement, second was laser RAMAN (differential absorption) and the third was opt acoustic detection.

Spectrum analysis provides a means the strength of periodic component of a single at a different frequencies spectrum of radiation due to electron transition and other quantum energy changes within molecules, each molecules have specific feature of spectrum.

In currently used mod for laser detections laser Raman.

Raman is spectroscopy which allows an easy interpretation and highly sensitive structural identification of trace amounts of chemical based on their unique vibrational characteristics.

Keywords: Laser, pollution, Detection, Raman, Spectrophotometer.



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Conservation of Otters in the World, Iraq as a Case Study.

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Abstract

The conservation of the otter is not a sentimental luxury; because they use both terrestrial and aquatic habitats and are at the peak of the food chain, they are an indicator of a healthy environment. A world without otters would be a world without clear coastal waters, without pristine river systems, lakes and estuaries and without the space and countryside that nature needs. Such a world would be a disaster for all species, including our own. There are 13 species of otter in the world and they are all listed in the Red List of Threatened Species. Like so many species on our planet, the otter is under threat predominantly as a result of man's activities through habitat destruction, pollution, hunting, global warming, wars and a growing human population. IOSF is based on the Isle of Skye, on the west coast of Scotland and there has been a long link between our area and Iraq through the sub-species of the smooth coated otter -Maxwell's otter *Lutrogale perspicillata maxwelli* R. W. Hayman, 1957. This is named after Gavin Maxwell who discovered the sub-species in the Iraqi marshes. He also spent a large part of his life on Skye and the nearby mainland, where he wrote his famous book "Ring of Bright Water". IOSF is therefore delighted to be working with Omar al Sheikhly on his various projects to highlight the importance of Maxwell's otter and its conservation. New data has been obtained on distribution not only through survey work but also by involving members of the public through citizen science. This can be a good example to many other governments and conservation organizations who are doing little or nothing to protect them. If we really want to protect otters we have to do more to bring about change and raise their profile and ensure funds are put into education and realistic conservation programs. But the future of otters does not rest only with those people who are actively working in otter conservation. It is the responsibility to of all of us to preserve otters, wildlife and the environment for our children.

Keywords: Conservation, Iraq, *Lutrogale*, Maxwell, Otter.



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Morphological, Anatomical and Chemical Study of an Exotic Plant *Jatropha* L. (Euphorbiaceae) in Iraq

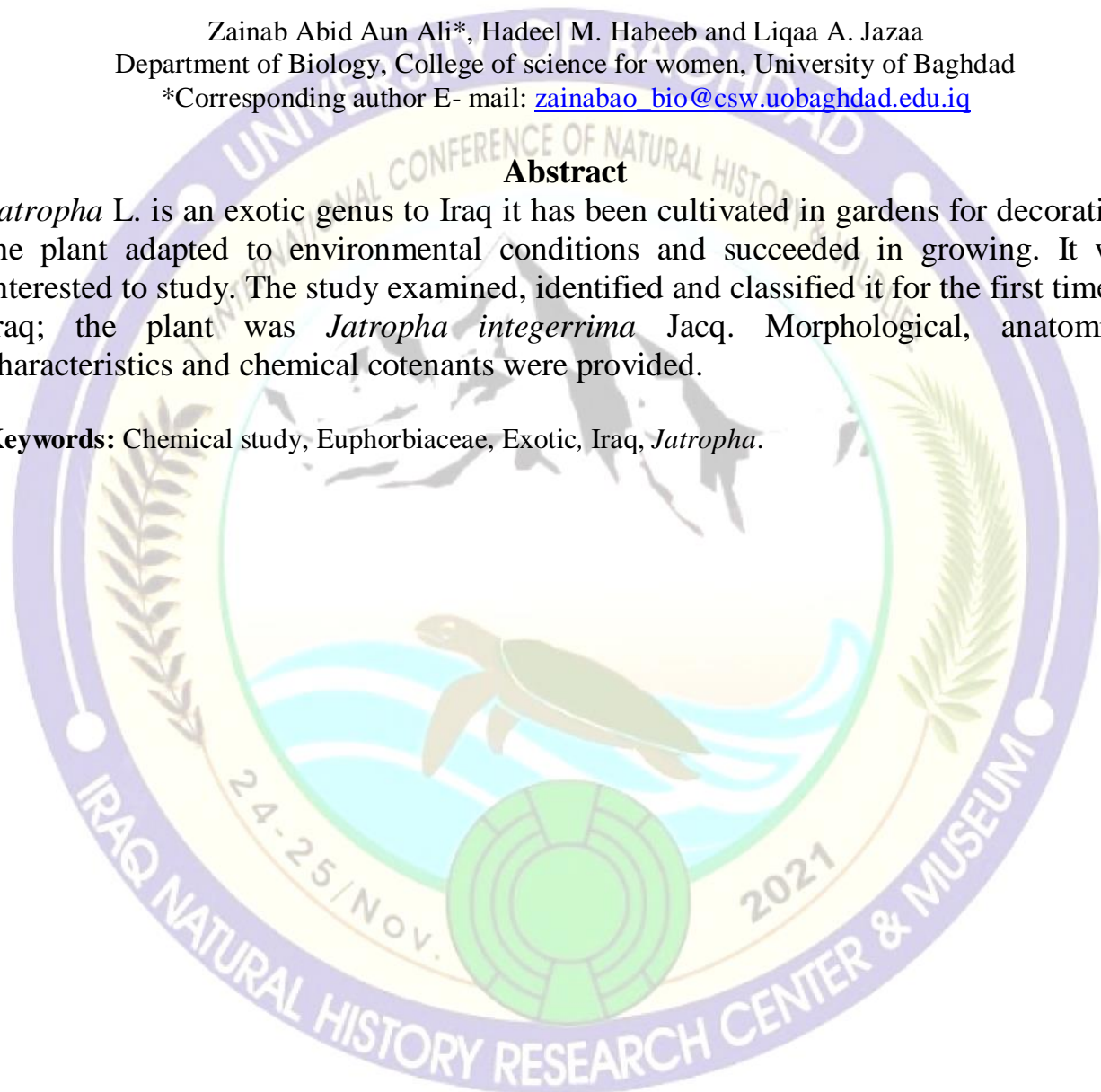
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Abstract

Jatropha L. is an exotic genus to Iraq it has been cultivated in gardens for decoration, the plant adapted to environmental conditions and succeeded in growing. It was interested to study. The study examined, identified and classified it for the first time in Iraq; the plant was *Jatropha integerrima* Jacq. Morphological, anatomical characteristics and chemical cotenants were provided.

Keywords: Chemical study, Euphorbiaceae, Exotic, Iraq, *Jatropha*.





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Survey of the Butterflies (Lepidoptera, Rhoalocera) Associated with some Brassicaceae Plants in Basrah Provence, Iraq

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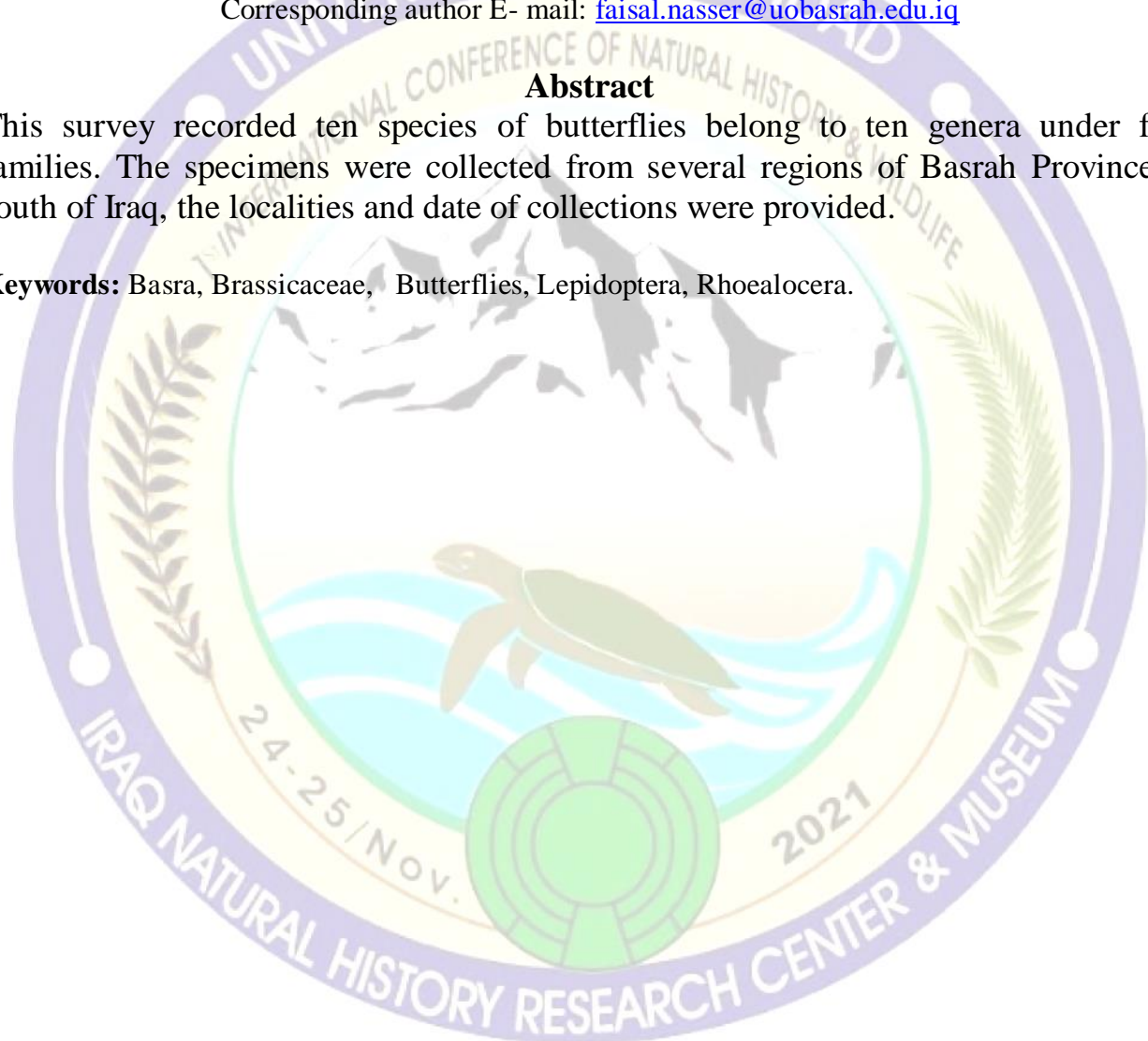
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Abstract

This survey recorded ten species of butterflies belong to ten genera under four families. The specimens were collected from several regions of Basrah Province in south of Iraq, the localities and date of collections were provided.

Keywords: Basra, Brassicaceae, Butterflies, Lepidoptera, Rhoalocera.





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Micromorphological Study of Some Species of Asteraceae

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Abstract

Six plant species of Asteraceae family have been investigated micromorphologically with the help of light microscope (LM) observations which are *Anthemis tinctoria* L., *Anthemis tubicina* Boiss. & Hausskn. *Artemisia herba-alba* Asso, *Artemisia scoparia* Waldst. & Kitam. *Artemisia monosperma* Delile, *A. eremophila* Krasch. & Butkov ex Poljakov; this study is describing the external morphology of seeds as well as a pollen grain morphology where triporate pollen grains are recognized for *Artemisia herba-alba*, *Anthemis tinctoria* and *Anthemis tubicina*; however, tetra-porate are found in *A. scoparia* and *A. eremophila* and trilete type are found in *Artemisia monosperma*. The configuration of pollen grain surface is different in the studied species which are granulated in *Anthemis tinctoria* and *Anthemis tubicina* while *A. eremophila* and *Artemisia monosperma* are slightly straight, on the other hand, the sculpture is reticulate in *Artemisia herba-alba* and smooth in *A. scoparia*. Also special importance is given to the size, shape, anticlinal and periclinal wall as well as the surface of the seed were significantly different. The shapes of studied species were differed from narrowly-oblong, oblong, long-oblong, and board-oblong, narrowly elliptic to narrowly-ovate.

Keywords: *Anthemis*, *Artemisia*, Asteraceae, Micromorphological Study, pollen.



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Poster

The role of natural biodiversity in enriching natural history museums with different living models

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Abstract

Natural biodiversity is the foundation of all human life and the root of its continuity, as it undoubtedly represent food, clothing and medicine. Man must preserve this biodiversity by placing it in natural history museums. These museums allow insights and provide answers to biological and environmental diversity questions over time. The study provided examples of ideas about the evolving role of natural history museums and their close relationships with biodiversity. It identifies challenges to realize the full potential of those museums and society and discuss the urgent need for their development. It also focus on drawing that relationship and modeling it in an artistic style of an aesthetic nature. The poster aim to show the tremendous developments in the biological sciences with modern artistic presentation methods related to the long-term storage of different types of specimens, showing the importance of these museums.

Keywords: Biodiversity, Enriching, Living models, Natural history museum, Role.



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Comparative Study of Anatomical Characters between Two Species of *Milium L. Growing Wild in Iraq*

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Abstract

The research included a comparative anatomical study of two species of *Milium L.* from the Poaceae family. The anatomical study included the characteristics of the epidermis of leaves, as well as the cross sections of the stem and leaves, as the study showed that the epidermis of the vegetative parts contained several types of cells, like long cells and short cells included silica and cork cells, in addition to the stomatal complex and the appendages represented like thorns and large hairs, as it produced the quantitative and qualitative characteristics of these structures of great importance in the separation and classification of the two species under study. Also, the cross-sections of the vegetative parts showed effective importance in isolating and diagnosing the two species, especially the shape of ling cells and short cells in the epidermis also the shape of stem and leaves.

Keywords: Anatomical, Comparative, Milieae, Milium, Poaceae.



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Survey on Prevalence of Endoparasites in Wild Rabbits in Ahar City, Iran

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Abstract

From April to June 2020, visceral samples of 30 wild rabbits in Ahar city of Iran were examined by direct-smear and Giemsa and Trichrome staining and lactophenole lucidation methods, also wild rabbits were Necropside to determine the prevalence of Endoparasites. Endoparasites infestation was encountered in 12 (40%) of Necropside rabbits.

Two different Nematodes and one species of Metacestoda and two different protozoa were identified in the contaminated cases.

The endoparasites found were identified as:

Passalurus ambiguus (12.24%), *Trichostrongylus retortaeformis* (8%), *Cysticercus pisiformis* (4.1%), *Eimeria magna* (11%), *Eimeria steidae* (4.66%).

Keywords: Ahar city, Endoparasites, Iran, Prevalence, Wild-rabbits.



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Leaf Anatomy Study for Epidermis some Species of Cypraceae Family in Iraq

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Abstract

In this research, some anatomical characteristics of the upper epidermis of species of Cypraceae family were studied; the species are: *Bolboschoenus maritimus*, *Carex distans*, *Carex aequivoca*, *Carex otrubae*, *Carex stenophylla*, *Carex pseudofetida*, *Fimbristylis ferruginea*, *Fimbristylis dichotoma*, *Eleocharis atropurpurea*, *Eleocharis palustris*, *Eleocharis uniglumis* and *Schoenoplectus litoralis*; moreover the study compared the species anatomically. The results showed that the studied anatomical characteristics of the epidermis of species such as (number of stomata in one microscopic field, length of long cells, width of long cells, number of long cells in one microscopic field, number of silica cells in one microscopic field, length of silica cells and width, number of rows of silica cells) is of taxonomic importance for differentiation and segregation at the species level.

Keywords: *Bolboschoenus*, Cypraceae, *Carex*, *Eleocharis*, *Fimbristylis*.



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Impact of Covid-19 on Human Health and Air Pollution through the Different Concentrations in the Aerosol Optical Depth and Particulate Matter over Iraq

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Abstract

Aerosol Optical Depth (AOD) a measure of aerosols that are small solid and liquid particles suspended in the atmosphere. Dust from wind, sea salts, volcanic ash, smoke from forest fires, and pollution from factories are all examples of aerosols. Depending on its size, type, and location, the aerosol can either cool or heat the surface. As the high concentrations of droplets when inhaled lead to infection of the upper respiratory system, damage to people's health, and this is related to the spread of the Coronavirus. Optical depth data for aerosols (AOD 496,550.675.865. 1248 nm) and Particulate matter (PM₁, PM₁₀, PM_{2.5}) of different concentrations were taken from the European Centre for Medium-Range Weather Forecasts ((ECMWF) for 2019 and 2020. The impact of COVID-19 on human health was studied by changing of Aerosols index and Particulate matter, and the relationship between them by comparing 2019, and 2020, while the results concluded that aerosols are less valuable in 2020 compared to last year, and the reason is due to the low percentage of pollutants. Such as carbon monoxide and nitrogen oxide, which are considered dangerous pollutants and affect human health, and it was observed in this study that the northern regions are almost devoid of aerosols and particles, as they are present at low rates for the year 2020 compared to in 2019, the central and southern regions recorded the largest An increase in cases, due to the variation in the proportions of aerosols and particles that help the spread of the Coronavirus (COVID-19).

Keywords: Aerosol Optical Depth, Air Pollution. COVID-19, Human Health, Iraq.



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Study Some Medicinal Components of Mistletoe (*Loranthus europaeus* Jacq) Parasite on Oak (*Quercus aegilops*) at Different Locations of Sulaimani, Iraq

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Abstract

This study were carried out on the (*Loranthus europaeus*) which parasite on host plant (*Quercus aegilops*). The results showed that, the parts of both host and parasite plants collected from Qaradagh gave the highest and significant values of total carbohydrate (25.66, 25.15 and 21.55 %), C/N (11.75, 19.73 and 21.49), total phenol (20.77, 11.67 and 8.16 mg/g), mucilage in parasite fruit (15.20 %), Rutin (26.76, 18.37 and 14.03 ppm), Ferulic acid (21.17, 10.85 and 11.37 ppm) and caffiec acid in May and October only (17.85 and 7.54 ppm) respectively. While plant parts collected from Sharbazher had the highest value of total protein (15.16, 10.19 and 7.04 %) and Gallic acid (16.35, 5.59 and 6.80 ppm). Mean time the plant parts collected from Howraman gave the highest and significant concentrations of Syringic acid and Catechin in May and July, respectively. Concerning the plant parts the results showed that parasite leaves had the highest value of total carbohydrate in May, while parasite plant stem had the highest value in July, and the fruit in October. In addition the parasite leaves had the highest value of total protein at all collection dates as well as the leaves had the highest value of total phenol in May, while in July parasite stem had the highest value and the fruit shows the highest value in October. Parasite stem had the highest value in Rutin at all collection dates, host leaves had the highest value of Gallic acid in May while parasite leaves had the highest value in July and parasite fruit had the highest value in October. The parasite leaves had the highest value of Ferulic acid in May and July but parasite fruit had the highest value in October, while parasite leaves gave the highest values of Caffiec acid at all collection dates. Mean time parasite leaves had the highest value of Syringic acid in May and July respectively but parasite fruit had the highest value in October. While host stem and parasite leaves had the highest values of Catechin in May, host stem in July and parasite fruit in October. Regarding the effect of collection dates the results referred that plant parts collected in May gave the highest values of Carbohydrate, protein, phenol, Rutin, Gallic acid, Ferulic acid, Caffiec acid, Syringic acid and Catechin.

Keywords: *Loranthus*, Medicinal, Mistletoe, *Quercus*, Sulaimani.



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Epidemiology and Associated Risk Factors of Sarcocystosis in Meat Producing Animals in Duhok Province, North of Iraq

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Abstract

Sarcocystosis is a zoonotic parasitic disease caused by cyst forming coccidian protozoa of the genus *Sarcocystis* species. These parasites require two hosts life cycle including herbivorous as intermediate host and carnivorous as definitive host. Total of 1100 slaughtered sheep, goats and cattle divided into three age groups were macroscopically examined for the presence of macrosarcocystis, as well as 70 stray dogs and cats existed around the slaughter houses and butcher places were microscopically examined for presence of oocysts & sporocysts of the protozoa in their feces. The overall frequency rate of macrosarcocystis in the intermediate hosts was 17.81% (196/1100). The infection rate in sheep was 22.4% (112/500) and in goats was 16.8% (84/500), while no macrosarcocystis was observed in cattle. In addition, the percentage rate of the parasite in male and female of sheep (7.5% & 41%) and goats (6.25% & 38%) in age group 3-4 years was found higher than in other groups. The parasitic incidence in esophagus, abdominal muscle, and diaphragm of the ruminants was 17.72%, 8.90% & 5.09%. The largest measurement size of bradyzoites ($24.02 \pm 1.30 \mu\text{m} \times 8.13 \pm 0.35 \mu\text{m}$) was found in the abdominal cysts. Furthermore, the overall distribution rate of sporocysts in stray dogs and cats was 55.71%. The infection rate in dogs (62.8%) was higher than in cats (48.5%). Statistically, no significant differences ($P > 0.05$) were observed in the frequency and distribution rate of the infection among the intermediate and definitive hosts, while significant differences ($P < 0.05$) revealed among the age groups of the ruminants.

Keywords: Epidemiology, Macrocystis, Ruminants, Sporocysts, Stray dogs and cats.



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Morphological Study for Accipitrid Birds (Accipitridforms, Accipitridae) in Iraq

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Abstract

A total of seven genus and twelve species that belong to one family Accipitridae, order Accipitriforms; about 53 voucher specimens which are deposited in the birds' collection in the Iraq Natural History Research Center and Museum INHM were reviewed. In the current study morphometric of twelve species of mummified Accipitrid birds: Sparrow-Hawk *Accipiter nisus* (Linnaeus, 1758), Greater spotted eagle *Aquila clanga* (Pallas, 1811), Tawny Eagle *Aquila rapax* (Temminck, 1828), Steppe Buzzard *Buteo buteo* (Linnaeus, 1758), long-legged Buzzard *Buteo rufinus* (Cretzschmar, 1825), Short toed Eagle *Circaetus gallicus* (Gmelin, 1788), Marsh Harrier *Circus aeruginosus* (Linnaeus, 1758), Montagus Harrier *Circus pygargus* (Linnaeus, 1758), Pallid Harrier *Circus macrourus* (Gmelin, 1770), Hen Harrier *Circus cyaneus* (Linnaeus, 1766), Griffon vulture *Gyps fulvus* (Hablitz, 1783), Egyptian vulture *Neophron percnopterus* (Linnaeus, 1758) were documented. In addition of the distribution ranges and conservation status of each of the mentioned species throughout Iraq were reviewed and comprehensively discussed.

Keywords: Accipitridae, Eagle, Harrier, Steppe Buzzard, Vulture.



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Assessment of Bacteriological Quality of Drinking Water from Various Sources in Tukarah Town, NE Libya

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Abstract

The aim of this study was to evaluate drinking water quality in 21 water sources categorized in three levels. Samples of water were collected from each source for bacteriological examination. The results show there was a significant difference between the three levels 1, 2, and 3 for total coliform and fecal coliform bacteria with p-values (0.026) and (0.003) respectively. Presence of total coliform and fecal coliform bacteria were not reported from level 3 and was zero MPN per 100 ml. However, the high contamination by total coliform and fecal coliform bacteria were observed in samples collected from levels 1 and 2, these were in the range of 2 to 350 MPN/100 ml, 2 to 26 MPN/100 ml respectively. On the other hand, the biochemical identification process using Phoenix identified technique for the six isolated strains as *Cedecea lapagel* (DW4), *Citrobacter freundii* (DW9), *Ochrobacterum anthroi* (DW10) *Pseudomonas aeruginosa* (S10), *Stenotrophomonas maltophilia* (DW4) and *Streptococcus anginosus* (DW2), with confidence value identities of 90%, 99%, 90%, 95%, 99% and 91% respectively. The findings showed that water from levels 1 and 2 did not conform to the world health organization (WHO) standard in terms of suitability for drinking purpose.

Keywords: Coliform, Fecal, Libya, Tukarah, Water.



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Estimation of Cadmium and Arsenic Elements in the Livers and Kidneys of Domestic Pigeons (*Columba livia*) Infected with Cestoda Worms in Al-Nassiriyah city, Iraq

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Abstract

The present study aimed to assess metal levels and the potential risk to birds, by Bioaccumulation of some heavy elements in cestoda worms and some tissues of its host (pigeons). Two concentration of heavy metals Cadmium (Cd) and arsenic (As) were determined in liver and kidney of *Columba livia domestica* infected with *Raillietina* sp.. 300 birds of *C. livia* were collected from local market at Al-Nassiriyah city. The birds were divided in to two groups: infected with *Raillietina* sp. and healthy group. 129 birds were infected with tapeworms which belong to three genera: *Raillietina* sp., *Cotugina* sp., and *Apronia* sp., with infection rates of 19,1%, 27,9% and 52,8%, respectively. Heavy element concentrations were measured by flame atomic absorption spectrophotometer (FAAS). The cadmium elements of pigeon recorded was high concentrations in summer season (0.60 $\mu\text{g} / \text{g}$) dry weight, in liver tissues of infected birds. While in healthy birds' liver tissues, the highest value recorded in liver tissue during the autumn season. The arsenic elements showed low bioaccumulation concentrations compared to cadmium concentrations, and its highest concentration was recorded in intestinal tissues in the winter as it reached (0.0092 $\mu\text{g} / \text{g}$) dry weight and also recorded high concentrations in liver tissue in the summer which amounted to (0.009 $\mu\text{g} / \text{g}$) dry weight, for infected birds.

Key words: Heavy metals, Bioaccumulation, Livers, Kidneys, *Columba*.



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Lead content of *Contracaecum* spp larvae (Nematodes) and their host *Silurus triostegus* Heckel, 1843

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Abstract

The present study was undertaken to investigate the infection patterns of *Contracaecum* spp among *Silurus triostegus* specimens (n=44) which were purchased fresh from local market in Baghdad. As well as to assess the lead accumulation in fish tissue (skin, gills, muscles, intestine and liver) and the parasites. One hundred and nine nematodes (larvae) were recovered from fish. The overall prevalence of *Contracaecum* spp. nematodes was (n=17, 38.6%). Sex of the host was not significantly ($P > 0.05$) associated with the occurrence of *Contracaecum* sp. Results also showed that the overall mean intensity of *Contracaecum* sp was 6.41. Mean intensity did not differ significantly ($P > 0.05$) between sexes. The lead was accumulated in all tissues investigated as well as in the parasites. Skin, muscles and the parasites (*Contracaecum* sp. larva) contained the lowest lead levels compared to other tissues (intestine, liver and gills), although no significant differences ($P > 0.05$) were noticed among all investigated tissues and the parasites regarding the concentration of Pb

Keywords: *Contracaecum*, Larvae, Lead, Nematodes, *Silurus*.



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Poster

Evidence of the Presence *Acanthocephalus* in Long-Eared Hedgehog *Hemiechinus auritus* (Gmelin, 1770) (Erinaceidae) Muscles

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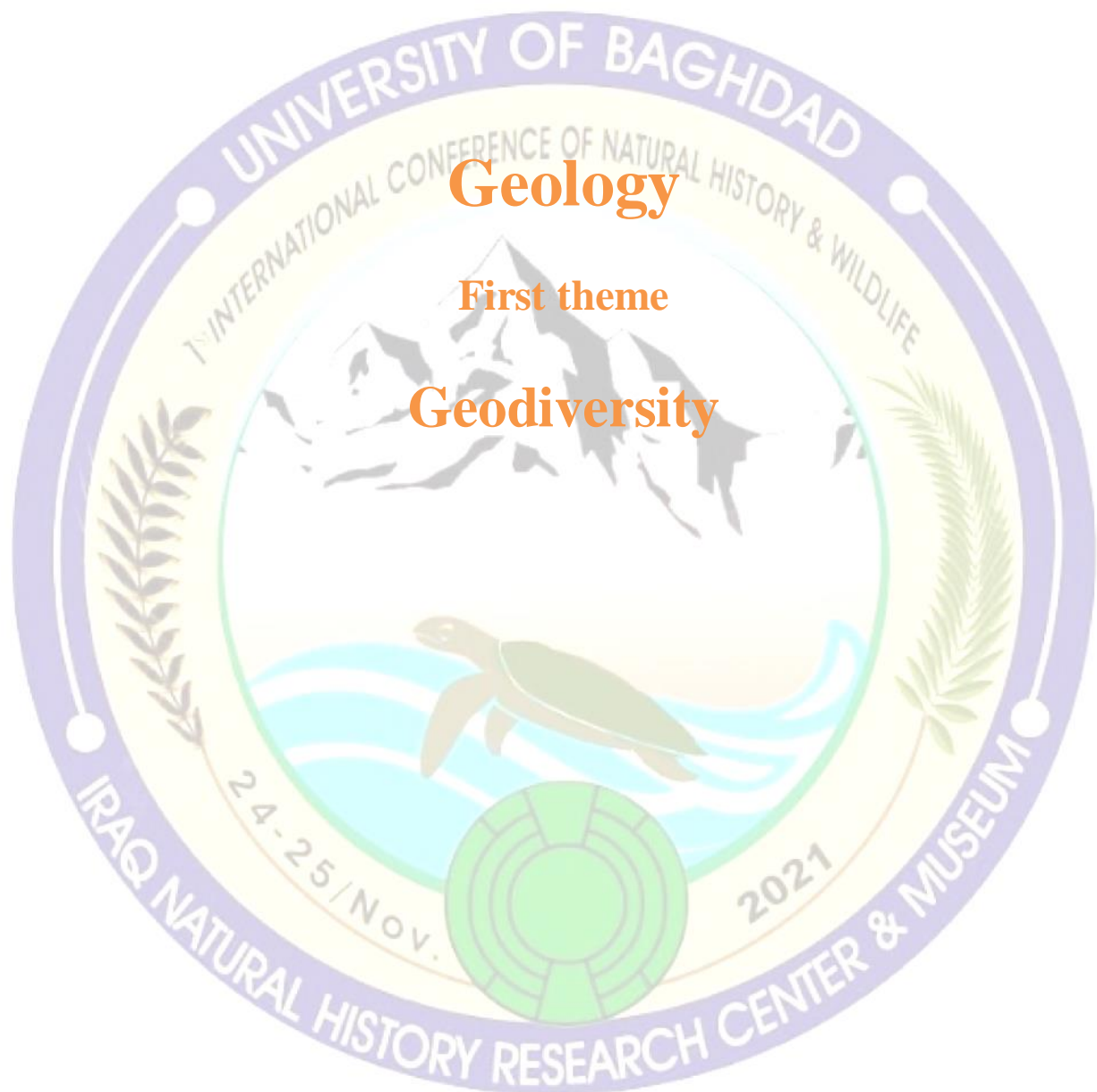
Abstract

The aimed of study was to run a histological investigation on muscle of native hedgehogs long-eared hedgehog *Hemiechinus auritus* (Gmelin, 1770) (Erinaceidae) to recognize possible presence of encysted *Acanthosphaalus sp* javelin. Five roads killed and farm dead hedgehogs collected in 2018. Three male and two female were necropsied. Adult *Acanthosphaalus* identified using the Yamaguti key. A histological study performed on 10 pieces isolated from hedgehogs arm and leg muscles by preparing 30 smears. Samples were fixed in 4% phosphate-buffered formalin, embedded in paraffin, cut in 5- μ m-thick sections, finally stained with haematoxylin–eosin. Slide-mounted sections were examined by light microscopy. From 44(100%) *Acanthosphaalus* obtained from intestines. 24 (55%) worms found males and 20(45%) found female. Intestinal Prevalence was 8.8%. They identified as *Macrocanthus hiradinasius*. Histological finding showed encysted javelin of *Acanthosphaalus sp* in one female hedgehog smears. Evidence of the presence of *Acanthocephalus sp* in hedgehog muscles in this area also introduces this animal as a paratenic host. This finding could be helpful in identifying the risk of transmission of this zoonosis to wild life animals.

Keyword: Muscle histology, long-eared hedgehog *Hemiechinus*, *Acanthosphaalus*, Iran



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Geodiversity of Smaqle Area as a Geopark in Kurdistan Region, Iraq

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Abstract

Depending upon the different characteristic of Smaqle area especially the geological and geomorphological heritage this study has been carried out. According to UNESCO definition, a geopark is a unified area that advances the protection and use of geological heritage in a sustainable way, and promotes the economic well-being of the people who live there, the study area perifered to be a geopark which have the condition of UNESCO to nominate as a geopark area. Smaqle area is located in the south eastern part of Saffen anticline North of Iraq Kurdistan Region. This study aims to present the Geodiversity of Smaqle area as an opportunity for future sustainable socio-economic activities in geopark. The Geodiversity includes geology and geomorphology heritage in addition to cultural heritage, local products, tangible and intangible heritage. Tectonically, study area lies within the High Folded Zone of the Unstable Shelf of Iraq, and affected by the collision of Arabia-Eurasia Plates and which started before 23–25Ma in northern Zagros, the exposed rock Formations in the Smaqle area ranges in age from cretaceous to Tertiary, the oldest outcrop Formation is Qamchuqa Formation. Stratigraphy of the study area including Qamchuqa, Bekhme, Shiranish, Kolosh, Gercus and Pila Spi formation. The study area is characterized by being a mountainous area with different heights ranging from valleys to high ridges. This is due to the factor of structural controlling the topography and differential erosion of the structures in the area and their different lithology of the rocks. There are many geomorphological landforms in the area which studied such as ridges, longitudinal and transverse valleys, sulfur springs, faults, drainage pattern, bad land and an elongate lake. These features are very interest as a tourism and health place, Also Local products and tangible and intangible heritage. The study area is suitable for construction of tourists place nationally and internationally which creates plenty of jobs to local people which leads to socio-economic development.

Keywords: Geological heritage, Geomorphology, Geopark, Smaqle area, Socio-economic development.



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Geotourism Potential of the Hor Al-Dalamj Area, Wasit - Diwaniya Province, Central Iraq

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Abstract

The Hor Al-Dalamj area extends from the Diwaniyah to Wasit province -Central Iraq. It is characterized by natural and environmental diversity. This diversity and the different type of soil and plants contributed to attracting large types of birds and wild animals, creating a natural and environmental balance. Hor Al-Dalamj area (located in the Mesopotamian plain) is considered a promising area for geotourism potential, as natural stone tools in archaeological site, agricultural and industrial activities according to the Potential Touristic Use characters. Hor Al-Dalamj sub-area geosite is characterized by the presence of aquatic vegetation, and fish wealth abounds in a large and diverse proportion, in addition to the presence of approximately 17 species of migratory and endemic birds. A number of people working in the field of agriculture and fishing live near it. Hor Al-Dalamj area is considered one of the world's works due to its environmental and geographical diversity, and it is famous for the presence of types of birds, including the wedgehog, swans, bustards and falcons, as well as fish and wild animals such as the fox, and the wolf. Many archaeological hills are still lofty in it, as it is an extension of the archaeological city of Nippur. The studied geosite has medium correspondence with the P.T.U characters because they are having bad roads and not progressing very well and classified as acceptable geosite. Hydrochemical analysis showed that the Hor Al-Dalamj marsh and main drain water unsuitable for human drinking, because most of the variable rate has exceeded permissible limits and they are acceptable grade for livestock and poultry. It is recommended to develop a strategic plan to study the environmental conditions and carry out integrated survey of the Natural resources, and the development and modernization of monitoring networks for water stations.

Keywords: Archaeological site, Geopark, Hor Al-Dalamj, Hydrochemistry, Iraq.



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Importance of Rhodolith Bearing Beds of Benghazi Formation in Paleoenvironment, Northeast Libya

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Abstract

Rhodolith Bed (RB) is documented twice within the middle Miocene rocks of the Benghazi Formation at Al Jabal Al Akhdar in Northeastern Libya. Two sections, the Daryanah-Al Abyar roadcut (DAR) and the Farkash Quarry (FQ) in the vicinity of Daryanah village have been sampled and studied on basis of the faunal and floral (algal) evidences with integration of lithofacial characteristic in order to evaluate the environmental setting of Benghazi formation at these locations. The repetition of Rhodolith-bearing beds twice in Farkash Quarry, where as in Daryanah-Al Abyar roadcut was only a single horizon are observed. The presence of the nodular rhodoliths herein is an indicator to a proximal part of the middle ramp below FWFB (i.e. >50m water depth). The established Miocene units are distributed in the range of ramp paleoenvironmental model.

Keywords: Al Jabal Al Akhdar, Benghazi, Libya, Paleoenvironment, Rhodolith bed.



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Urbanism of African Cities and the Destruction of Geosites and Geomorphosites, Case of Goma City, Democratic Republic of Congo

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Abstract

Social development of a civilization will not have its peak without resorting of geological services. Apart plant products, most building materials are inorganic. Urbanization is a universal phenomenon and has experienced a particular acceleration in African Sahara. This strong growth occurred in a particular economic context marked, the case of Goma, being border and provincial town, its surroundings in the last ten years are vulnerable security targets whose consequence is the rural exodus. Demographical evolution is a threat to space in urban entities. Some individuals come to town looking for work, while others come there just to consume their fortunes. The use of the areas in the urban center is detrimental to heritage, cultural, tourist, and even customary. In the case of Goma, selected examples; Mount Goma-Kanyaruchina-Lac Vert -Kamuchanga concretely illustrate the protection, management and development of Geosites and Geomorphosites. The inventory and strategies to protect the geosites and gemoprhosites by their allocation to the protected areas besides a mutual aid between university and ministerial posts and local political volunteers is worth for the safeguarding and to emphasize. Goma is losing its touristic sites due to the demographical threats.

Keywords: Congo, Geosites, Geomorphosites, Goma City, Urbanism,



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Geodiversity and its Archaeological Importance in the Iraqi Southern Marshes, South Iraq

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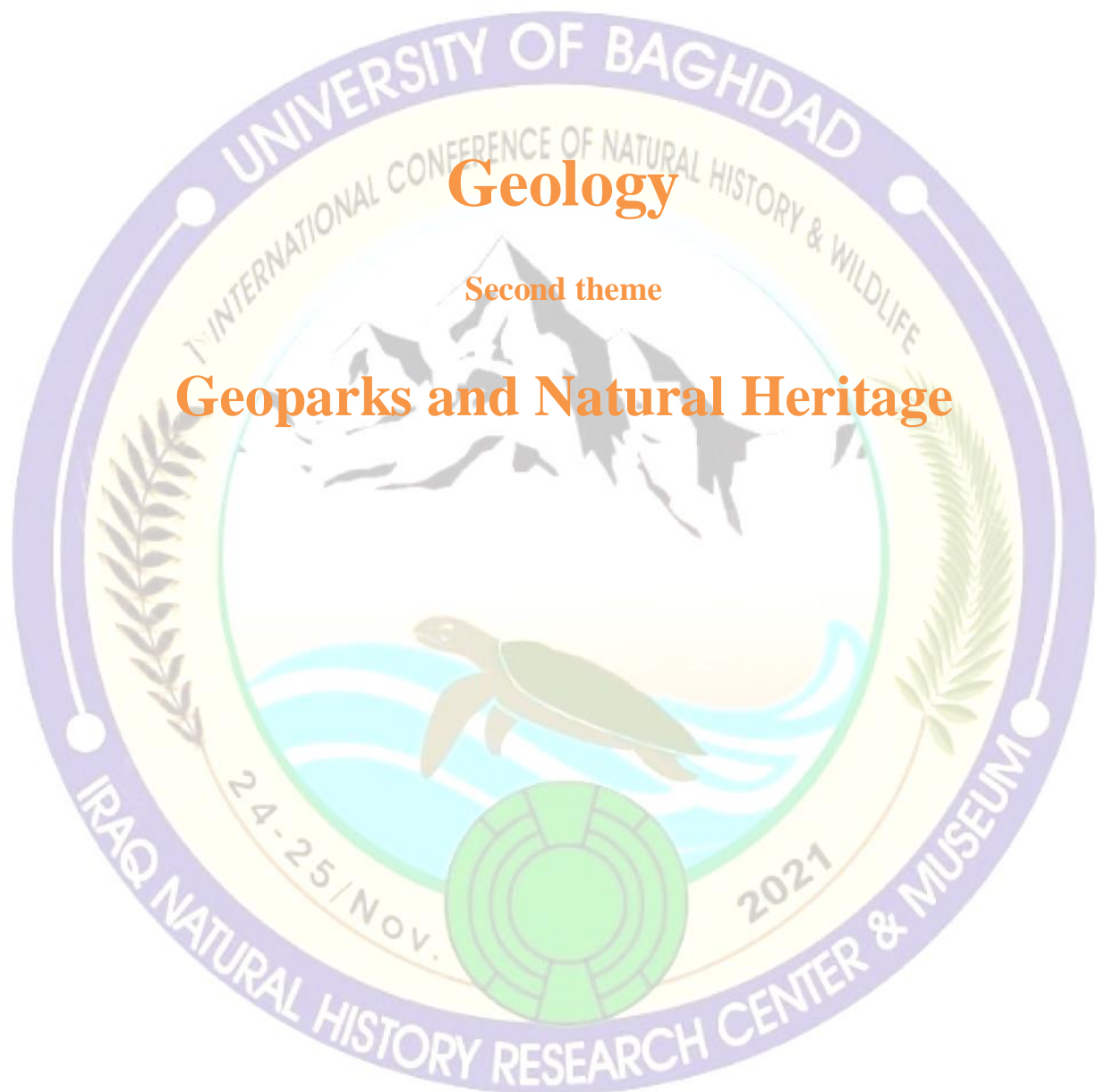
Abstract

The Iraqi Southern Marshes are located in the southern part of the alluvial plain southern Iraq. The study depended on the field surveys, local communities' interview, reviews previous studies, research and publications on the marshes. Geodiversity is the main natural resources, includes rocks, landforms, soil types and water resources. The ancient man chooses the sites have provides his daily needs, such as water, food, building materials, as well as protection. It was noted in many archaeological sites near the marshes, the presence of stone tools made of limestone, dolostone, sandstone, flint, conglomerate, trachites, basalt, dolorite, quartzite, in addition to precious stones. As well as the bitumen used by the inhabitants of the marshes to prevent water leakage from jars, an adhesive and a binder in construction, in bathrooms, and for painting boats, and as a medical treatment as a disinfectant and insecticide, and others. The topography of Iraq, consisting of the folded zone, alluvial plain zone, island and the Badia zone, contributed to the formation of the basins or depressions of the marshes in the southern part of the alluvial plain in which water collects. The soil near the marshes is composed of modern, loose sediments consisting of fine sand, silt, and clay, which has helped in the presence of fertile soil and the spread of agriculture. The water resources consisting of the Tigris and Euphrates Rivers and their branches, Hawizeh Marsh, Central marshes, Western Hammar Marsh, and the Eastern Hammar Marsh. The abundance of soil and water resources contributed to the development of agricultural economies that replaced hunting and gathering in Mesopotamia. Ancient human made pottery and building bricks (dry and fired) from clay and alluvial materials deposited from the Tigris and Euphrates rivers and the marshes in the alluvial plain. The State Board of Antiquity and Heritage (SBAH) discovered near Iraqi Southern Marshes about ten very important cities, some of them dated to the second millennium BC.

Key words: Geodiversity, Archaeology, Marshes, Topography, Iraq.



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Potential Area for a National Geopark and Geosites near Himreen Mountain, Middle of Iraq

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Abstract

Study area is located on the north- eastern limb of Himreen Mountain, on the main road between Baghdad and Kirkuk. Himreen Geopark includes five geosites of national importance, first was Himreen vertebrate fossils geosite (evolution of life), second was Himreen volcanic activities geosite (structural and tectonic features), third was Himreen depositional environment geosite (ancient environment), fourth was Himreen economic deposits geosite (rare rock types and rock structures) and fifth was Himreen burnt hills geosite (representative surface and subsurface features). The main geological features and processes of Himreen vertebrate fossils geosite are the findings of 21 species of vertebrate fossils in the sandy conglomerate bed extended about 30 kilometers within Mukdadiyah Formation (Pliocene). Himreen volcanic activities geosite contains volcanic ash sediments exposed in the Mukdadiya Formation are refers to volcanic activities at L. Miocene– Pliocene. Himreen depositional environment geosite includes many ancient environments, such as: closed lagoon environment (Fatha Formation); transitional environment from marine to continental in addition to fluvial environment (Injana Formation); fluvial depositional environments (Mukdadiya Formation) and fluvial to lacustrine environment (Bai Hassan Formation). Himreen economic deposits geosite: Contains various types of minerals and industrial rocks, such as: gypsum, native sulphur in Fatha Formation, bentonite in Mukdadiya Formation as well as gravel and sand aggregates in Bai Hassan Formation and also in the Quaternary sediments. Himreen burnt hills geosite, It is contains six prominent hills, situated along the major reverse fault and capped by dark vesicular rocks. Fused rocks contain mainly pyroxene, plagioclase, with minor amount of quartz, calcite, gypsum and stilbite.

Keywords: Economic Deposits, Geopark, Geosite, Himreen Mountain, Vertebrate Fossils.



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Natural Radiological Properties of Infracambrian Rocks in Jabal Sanam Structure, Southern Iraq

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Abstract

Jabal Sanam is a salt plug represents a unique geological phenomenon in southern Iraq, about 45 km to the south west of Basrah city. It is a remarkable geological landmark rises about 141m a.s.l. and covers approximately 2 km² surrounded by flat areas on all sides. It considers as a nature reserve occupied by various sedimentary, metamorphic and igneous Infracambrian rocks. It also has several geological outcrops, valleys and caves in addition to various wild plants and animals, which all make it a destination for research, school and university trips and domestic and international visits. However, several attempts were made in the previous years to establish Jabal Sanam as a nature reserve, a number of obstacles faced this idea, foremost of which was the belief that the rocks of the region were contaminated with radioactive elements due to the military operations in this area during the first and second Gulf Wars. Accordingly, determining the radiological properties of this area is fundamental to evaluate the potential radiological risk hazards on human body. A wide range of rock samples from different parts of Jabal Sanam were collected. Optical microscope and X-ray diffraction (XRD) techniques were used to examine and identify the variable rock types in this structure. Natural radioactivity and effective dose of these rocks were measured using field and laboratory equipment to identify the type of radioactive isotopes and determine the level of radioactive pollution in this area. The results showed that the activity concentration of the natural radionuclides of the studied sample rocks ranging between 36 Bq kg⁻¹ and 141 Bq kg⁻¹ with an average of 87 Bq kg⁻¹ which is lower than the safe limit 370 Bq kg⁻¹ recommended by the Organization for Economic Cooperation and Development (OECD). Furthermore, the average effective dose to individuals from all rock types was 1.22 mSv y⁻¹ which is much lower than the upper dose rate limit of 10 mSv y⁻¹ for Category A and 6 mSv y⁻¹ for Category B (assuming 2000 working hours per year).

Keywords: Iraq, Jabal Sanam, Natural radioactivity, Precambrian rocks, Salt plug.



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Using Conceptual and Quantitative Models Approach to Evaluate the Criterion Values of Potential Geopark Sites. Missan Area SE Iraq

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Abstract

The geotourism and geoeducation potential capabilities were measured quantitatively in the Teeb River Valley Eastern Maysan. This valley has area about 7 km² and extends for a distance of about 7 km on the Teeb River. This valley has many geoscience activities were taken in account in this study, in addition to the biodiversity. Satellite images, drone photos and maps are used together with field works to build the conceptual model and to develop a realistic quantitative approach to evaluate the scientific, educational, functional, and touristic categorize values for the valley. These categorized values were weighted for three types of audiences: university students, school pupils, and tourists then the geoscience activities in the area are registered and classified. The results show that geoeducation and geotourism values are very high than the values computed for many places in the same area in previous study. The conceptual model gives a great tool to interpret and classify the geological features in the study area. The diversity of scientific values of each site along the valley are also studied where the petroleum, quarries, and hydrological activities increasing the geoeducation weight of the specific site and supplied more geological knowledge. The types of natural plant and animals were left to be studied by specialist teams in future

Keywords: Criterion Values, Geopark, Maysan, Quantitative Models, SE Iraq,



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Geotourism Parameters Assessment of Batnan Region northeast Libya for Potentiality of Sustainable Development

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Abstract

This paper presents a preliminary geosite physical assessment model which has the potential to assist in the sustainable planning and management of natural locations and their transformation into tourism destination. This study was carried out on Al Batnan region northeast Libyan, which encountered between Bomba bay in the west, Mousaed in the east, Jaghboub in the south and the Mediterranean Sea in the north, between Longitudes 23 10" 00' and 25 15" 00' and Latitudes 31 50" 00' and 32 45" 10'. The objective of this study is the assessment of geotourism potentialities of some locations such as Ain Al Ghazalah, Wadi Al Sahl (Tobruk), Wadi Abou Al Gomel (Tobruk), Wadi Al Raheb (Kambout), Wadi Rezq (Al Bordy), Wadi Al Sawani (Al Bordy) and Al Jaghboub Oasis. These geosites denoted by GS1, GS2, GS3, Gs4, GS5, GS6 and GS7 respectively.

The study based on the analysis of geotourism potentialities using the geosites assessment model (GAM) with values index range between 0.0 and 1.0. Also SWOT (strength, weakness, opportunity, threats) and TOWS analyses have been applied to evaluate these geosites to achieve sustainable development. The analysis of models parameters revealed that there is a variation of potentialities between the studied geosites according to indicators and sub indicators. Whereas, the GAM matrix analysis based on main and additional values, the seven geosites are represented in three zones of matrix, whereas, GS2, GS4 and GS5 in zone Z11, while GS1 in zone Z21. The other geosites GS3, GS6 and GS7 are represented in a good locations in the matrix, and this is attributed to their higher values of MA and AV. On the basis of these analyses for the studied geosites it can concluded that these geosites regard as an important location of geotourism in the future if they are taken into consideration as a natural resources of sustainable development.

Keywords: Analysis models, Batnan, Geotourism Parameters, Libya, Sustainable Development



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Speleothem Documentation from Kuna Ba Cave, Sulaimani Area, Kurdistan Region, North of Iraq

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Abstract

The karst terranes exhibit spectacular landforms that are often exploited as natural parks and show many cave deposits known as “speleothems”. A sedimentary-morphologic criteria was used to classify and document the speleothems as karstic counterparts from the multiple-chambers Kuna Ba cave in the Sulaimani area that formed as karst feature within the hard dolomitic limestone of the Upper Eocene Pila Spi Formation. Through a detailed field work and description, here we present one of the first trails to describe the speleothems in Iraq, from aspects of their classification, size, and abundance. A total of fourteen speleothem forms were recorded: *Baldacchino Canopies*, *Bathtubs*, *Column*, *Coralloids*, *Draperies*, *Flowstone*, *Moonmilk*, *Rimstone*, *Shelfstone*, *Showerheads*, *Sodastraws*, *Splattermite*, *Stalactite*, and *Stalagmite*. This descriptive study shows that the well-developed speleothem structures were exist at the third and fourth chambers, and the *Stalagmites* were the most abundant speleothem forms in the Kuna Ba cave at Kurdistan Region of Iraq.

Keywords: Iraq, Karst, Kurdistan, Speleothem, Sulaimani.



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Necesity of Creating a Geopark in the North Kivu Province, Democratic Republic of the Congo

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Abstract

North Kivu Province is considered as the touristic basement of the Democratic Republic of the Congo (DRC). It's positionnement in bordering the East African Rift System segment gives to this space a specific geomorphology anywhere else in the country. The active volcanoes of the Great African Lake Zone, Nyiragongo and Nyamuangira, are located in this province in front of the Republic of Rwanda with which the country borders the magmatic chamber. Except the Virunga National Park, oldest of Africa protected area created in 1925. The ten principal craters and many cones give a sweet landform. The touristic history of the DRC is known from volcanoes and parks. For the North Kivu, apart the active volcanoes, rifting lakes, and the national park unknown touristic sites are hidden and need to be public; some of them are to be considered from their geological characteristics. Hosting carbonate rocks, the rare Kuvician cave is identified Kasugho and some volcanic tunnels Kako and Rumangabo in or out the park. Associated to the active volcanoes, the region has the most geothermal springs of the country. Besides, some small squared volcanic lakes (Green Lake and Black Lake) are located in ancient craters, greenish to blackish colored waters due to the backgrounds and/or plants surrounding the water stagnations, and some time with chimpanzee zoo. Some cones are paved within a pouzzolanic rock, while others are grained with or no crystals of pyroxene and/or olivine.

The goal of this paper is to present and describe unique sites of the North Kivu and in mission to decide on the creation of the geopark to reinforce and attract more tourists from anywhere around the world, nationals and/or internationals.

Keywords: Congo, Geothermal, Kivu Province, Sedimentary basin, Volcanic lakes.



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Bestoon Cave's as Important Resource for Geoheritage, Iraq

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Abstract

Bestoon Cave is located on the northwest limb of the Bradost Anticline axis in the Iraqi Kurdistan Region, within massive carbonate rock-bed units of the Bekhme Formation (Upper Cretaceous, total thickness ~100m). Indeed, the Bekhme Formation is well-known as one of the famous and widest spread formations in the Iraqi Kurdistan Region and interpreted as a shallow-water marine carbonate shelf system which includes rich ammonite faunas. The length of the cave is 40 m and its channel extension is about 450 m, its width is 22 m and its height is about 8 m. A geological survey on 18th July 2021, showed that the karstification is still active with water being still dripping from the cave ceiling, continuing to build many types of speleothems, such as stalactite, stalagmite, walls, windows, pillars; additionally, travertine terraces and pools can be observed to develop. The Bestoon Cave, as a natural resource, is important in terms of: (1) Scientific interest (2) Educational purposes (3) Geotourism-recreational use; (4) ecological value and (5) archaeological value. Unfortunately, the presented cave is nowadays subjected to several threats from visitors, such as breaking of speleothems, open-pit digging to collect water, firing, disposable plastic containers, using large plastic containers to collect water, and footprint on all the areas of the cave. This study aims to highlight the importance of performing a full-scale scientific study, education geotourism and ecological value of the cave that can be nominated as a geoheritage to protect it from all types of threats, in addition, to use it for educational and geotourism -recreational purposes. Finally, due to site assessment criteria, the Bestoon Cave is highly recommended to be a geoheritage site on the national level.

Keywords: Bestoon cave, Geoheritage, Iraqi Kurdistan, Speleothems, Geoheritage.



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Identification of Recharge Area in Batur UNESCO Global Geopark By Isotope Stable Analysis

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Abstract

Batur Lake and Volcano is situated at Bali Island with high population growth, changes in public housing developing land toward the slopes of the volcano are challenges for conservation. The Batur Volcano a geosite in Batur UNESCO Global Geopark, is an important site for groundwater conservation. Until now, previous studies on Batur Volcano have only been based on the conventional approach, the accurate determination of recharge area becomes a key factor for the groundwater sustainability to support the geopark. The study objective is to determine of the recharge area by method of combining geological setting, stable isotopes and chemistry content of groundwater. The study major result is the location of recharge area for Batur UNESCO Global Geopark, which determined the water flow based on stable Isotope method. The implication of this study is the Deuterium and Stable Isotope method can be replicated to other groundwater conservation studies on volcanic areas.

Keywords: Conservation, Deuterium, Isotope, Groundwater, Recharge area



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Geoparks: Nature Conservation, Socioeconomic Development and Sustainability

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Abstract

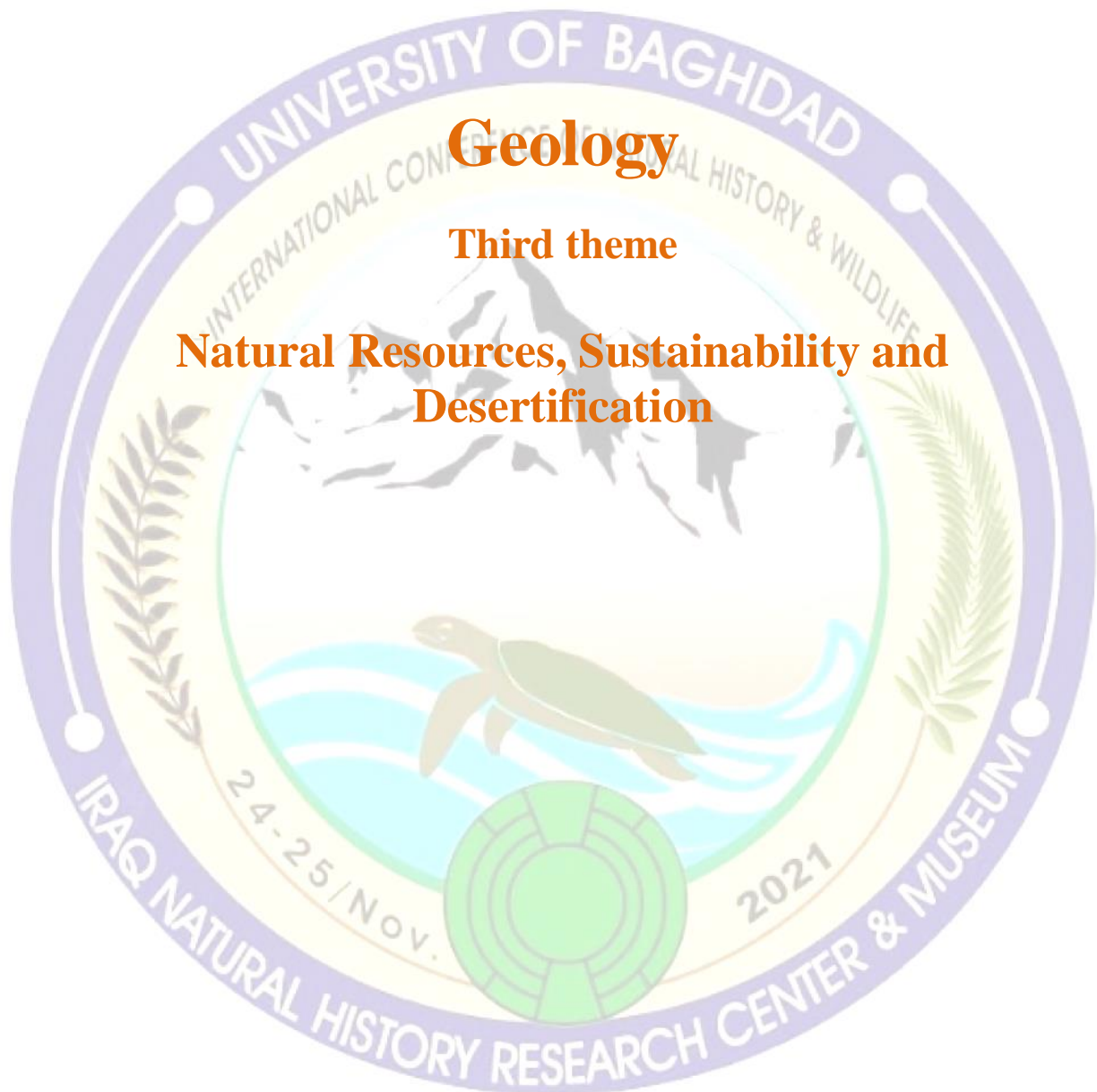
Geoparks are sites with unique geological features and landscape that attract visitors, researchers and students. While these sites deserve conservation, they occur in areas with local communities who deserve a socioeconomic life style that benefits from the occurrence of these attractive sites in their backyards. Geoparks, as such, provide ideal opportunities for nature conservation and sustainable development with full engagement of the local communities in the process of management and protection as their own resource.

The UNESCO Global Geopark are territories where landscapes and geological sites of “international geological significance” are managed with a holistic concept of protection, education and sustainable development. Egypt and the Arab region thrive with so many sites, where the concept can be applied. The greater Fayoum territory is presented here as an emerging candidate with the best criteria to start with. It provides an ideal combination and coexistence of a unique landscape with the protected area of Wadi El Rayan and the world natural heritage of Wadi al Hitán in its core. Moreover Fayoum enjoys numerous archeological sites extending deeply from prehistoric via pharaonic to Coptic and Islamic. Local communities with inherited handicrafts and agro economic products as well as their cultural style beside ecotourism, education and research opportunities are all significant factors of attractiveness that can put the territory of Fayoum on top of the candidates as a Global Geopark.

Keywords: Geoparks, Egypt, Fayoum, Nature Conservation, Wadi Al Hitán.



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& WILDLIFE





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The First Human Inhabitants during Late Pleistocene-Holocene in Northern Iraq

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Abstract

Iraq is considered to have many important archaeological places, at least 1307 known archaeological sites in the Kurdistan region only. Part of them belongs to Lower, Middle, and Upper Palaeolithic time. Among the famous caves are Shanidar, Zarzi, Hazar merd, and Bestoon that were inhabited by human during Paleolithic time. Due to the unique tools that were found in these sites that were used by humans at that time, their names became famous of several specific historical ages such as Bradostian (Upper Palaeolithic) and Zarzian (Middle Palaeolithic). This study tries to describe each of these caves geologically, archaeologically, and their suitability to become tourist sites for local and international visitors. Much of soluble rocks such as limestone, dolomite, and evaporites were deposited throughout Mesozoic and Palaeogene periods. The existence of these types of rocks allowed the construction and growth of karstification morphology. Some geomorphological characteristics such as stalactite and stalagmite appear to be attractive features. Archaeologically, the tools that were found in each of the sites are unique and may explain the civilization progress stages in Mesopotamian area. Furthermore, the spores and pollens that were found in human habitat will help to interpret the climatic changes throughout time.

Keywords: Karst, Archaeology, Palaeolithic, civilization, northern Iraq



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Survey of Khor Al-Zubair/ Um Qaser Mudflat Shorebirds: Effect of Tidal Cycle and Seasonal Variation on their Assemblages and Abundance, Basrah, Iraq

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Abstract

Ornithological surveys were conducted at a tidal mudflat which nationally represents one of the marine key biodiversity (KBA) areas at Khore Al-Zubair (KBZ)/ Um Qaser south-west of Basrah City, Iraq. On the basis of hourly counting for 7h monitoring period at day time and covering an area of 7.5 km² of the intertidal zone, a 7 surveys were conducted from March 2019– January 2020. A total of 5654 individual birds belonging to 54 were recorded. The highest numbers of birds per one day were recorded in autumn and winter 2875, 1999 respectively, which found coincided with the migration seasons. The lowest numbers were recorded during the summer season just only 58 birds. The birds' assemblages and their abundance during the high tide times and during the low tide times were compared statistically and the results weren't different ($t < 0.05$). Additional observation of different surveys targeted the KAZ over the period 2005-2020 resulted in a final list consist 101 birds species, a result reflecting the importance of this habitat to various migratory and resident birds.

Keywords: Basrah, Iraq, Khor Al- Zubair, Shorebirds, Um Qaser.



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Geological Characteristics and Spatial Distribution of Sand and Gravel Quarries in Basra Governorate - Southern Iraq

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Abstract

A field geological study was conducted to determine the locations of sand and gravel quarries in Basra Governorate, southern Iraq, and classify them based on their geological and engineering characteristics. Three main sites were identified for the presence of these quarries: Safwan (Al-Zubayr) in the south of Basra, Juwaibdah and Al-Batin, west of Basra. The study included determining the mineral, engineering and geochemical properties of the sediments of these quarries for the purpose of determining their locations and distribution according to geological sections through field surveys, and then evaluating them for the purpose of using them in various engineering fields. The mineral examination by X-ray diffraction (X.R.D) of selected samples of these quarry sediments showed that they consist of basic minerals, the most important of which is quartz in high concentration, as well as feldspar, gypsum, salts, heavy metals and gravel of igneous and metamorphic origins. The mineral examination by polarizing microscope showed the prevalence of quartz grains of spherical or semi-spherical shape, which have luster, in addition to the presence of opaque and sometimes transparent minerals in the sediments of Juweibdeh site. It is little due to its distance from the source, while the Safwan site was distinguished by the presence of quartz with sharp edges and few spherical quartz grains with a few luster, in addition to containing a high percentage of feldspar and muscovite minerals. Volumetric analysis of aggregates extracted from quarries sites was carried out and classified geometrically after conforming to the Iraqi specifications. Juwaibdeh and Al Bateen quarries were considered sand quarries, while Safwan and Al Zubair quarries were considered mixed sand-gravel quarries. The geochemical analyzes of the representative models indicated that all of these models did not conform to the Iraqi Standard Specifications No. 45 of 1984 and its amendments (No. 1 for the year 2015 and No. 2 for the year 2016) in terms of containing high percentages of SO₃ salts, while they had identical and good specifications in terms of the proportions of Cl salts. Organic materials and stability from an engineering point of view, making these quarries a rich source of economic materials with good specifications that are important in many engineering and construction purposes.

Keywords: Geological Characteristics, Gravel Quarries, Iraq, Sand, Spatial Distribution.



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Geochemical Assessment of Drinking Water: A Case Study of the Bo Traba Seawater Desalination Plant

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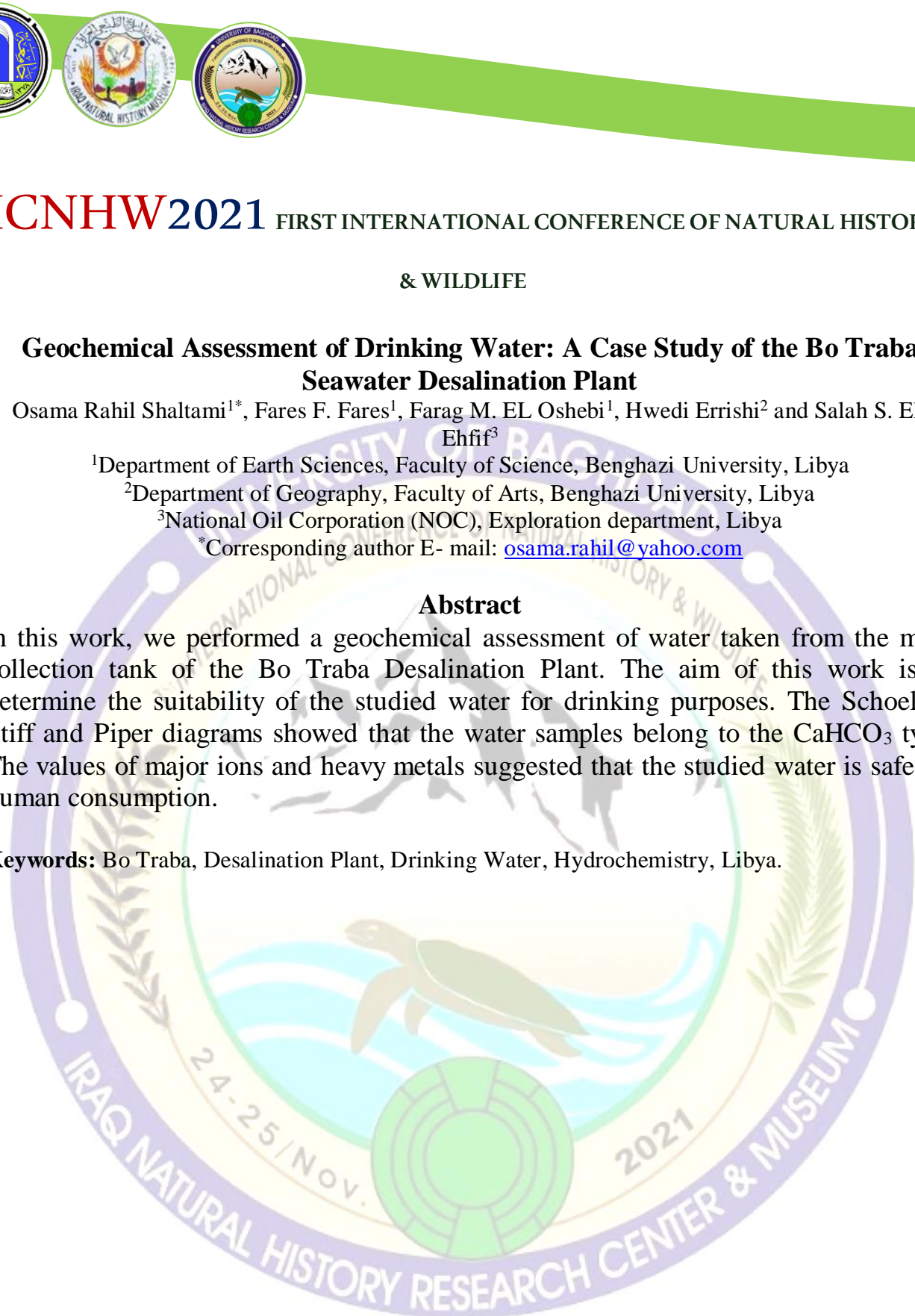
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Abstract

In this work, we performed a geochemical assessment of water taken from the main collection tank of the Bo Traba Desalination Plant. The aim of this work is to determine the suitability of the studied water for drinking purposes. The Schoeller, Stiff and Piper diagrams showed that the water samples belong to the CaHCO_3 type. The values of major ions and heavy metals suggested that the studied water is safe for human consumption.

Keywords: Bo Traba, Desalination Plant, Drinking Water, Hydrochemistry, Libya.





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Monitoring Some Physical and Chemical Properties of Water in the Eastern Al-Haweza Marsh Using Satellite Imagery and Geographic Information Systems

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Abstract

The Iraqi marshes environments had dramatic changed during the recent years. So, it's essential to study the environmental assessment impact on Iraqi marshes. The environmental quality is greatly focused on water because of its importance in maintaining the human health and health of the ecosystem. The study is aimed to determine the some physical and chemical parameters of water bodies and detect the environmental changes in the study area. 19 samples were collected from the study area from June to October 2017. Parameters include hydrogen number (pH), total dissolve solids (TDS), turbidity and electrical conductivity (EC). The study area is Al-Haweza marsh, includes Am Al-Naaj, Al-Audhem and Al-Sauda. This paper discusses the application of GIS specifically in monitoring water quality parameters. GIS provides effective tools in monitoring of water quality parameters aid with in situ measurement data. Geostatistics is one of the most advanced techniques in GIS for interpolation of water quality; it is essentially useful in protection, management and preservation of water quality. In this analysis, Kriging method is used for predicting spatial distribution of various parameters.

Keywords: Al-Haweza marsh, Iraq, GIS, Water quality, Satellite Imagery.



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Basic Concepts of Environmental Geo-Sciences

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Abstract

The authors of this article hope to increase the knowledge's and awareness of the engineers about the importance of Environmental Geo-Sciences studies in diagnosing and analyzing the potential natural geological risks (landslides, floods, climate changes effects, desertification's, sea level problem, sediment, erosion, transport, deposition, dust storms and sand dune movements) as well as the environmental impacts that may occur within any site selected for build-up a strategic development project taking at the same time the effects of the different operational conditions of these strategic projects with time which need require to be predicted in advance before planning and implementing and strategic project at any selected area and measures should be taken to reduce, control or mitigate all expected potential natural and environmental damages and to understand the dynamics of the earth surface phenomena in advance within their selected sites which might effects negatively the stability of the planned strategic projects before its implementations and to understand the possible and expected environmental complications in the selected areas beside their negative influence on the financial cost of the projects. Environmental Geo-Sciences can help in providing information's and recommendations as protection measures to prevent any damages and in modifying the basic engineering plans of the projects which should protects the project and its possible wide range of its environmental implication. The proposed article is a theoretical research with practical implementations at any selected sites on the surface to achieve the above listed objectives.

Keywords: Basic Concepts, Environmental, Geo-Sciences, geological risks, dynamics.



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Lithological and Geochemical Assessments of the Eocene Apollonia Formation at Karsah Region, Cyrenaica Libya

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Abstract

This paper provides a more detailed lithological description aimed to assess the Apollonia Formation in Wadi Bin Jibarah and Wadi Attir 8 km west Karsah village. Seventeen Samples were collected from both wadies, were then made into thin sections, stained with Alizarin Red and examined using a petrographic microscope. Elemental analysis of major oxides (wt. %) of the Eocene limestone samples have been performed through X-Ray Fluorescence (XRF). The geochemical composition of the whole rock reveals that the SiO_2/MgO ratio is (0.01:0.04) in Wadi Attir, which is much lower than Wadi Bin Jibarah (0.04:0.08), and MgO is < 3 %. Apollonia at these two measured sections made of 160 to 180 m, thickly bedded limestones that are alternating by thinly bedded chalky limestones and highly chalky. It consists primarily of white to cream, hard, mudstone to wackestone, locally chertified, with chert nodules at some levels of variable sizes, with few mollusks and extensive bioturbation at local levels. Petrographically, mudstone is the dominant facies containing few to rare planktic foraminifers and other shell fragments. There are some evidences of reworked stromatolites which is appearing at specific levels. The possible applications of Apollonia Formation are; cement, dimension stones, decoration walls, aggregate in road stones, concretes, irons & steels, weighting agent in drilling mud fluids, carpet packing and fillers in other industrial products.

Keywords: Apollonia, Chert, Eocene, Wadi Attir, Wadi Bin Jibarah.



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Assessment of Haj Yousif Springs for Balneotherapy Purposes in Mandali, Diyala Province, East of Iraq

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Abstract

The present research surveyed the balneological characteristics of spring water of Haj Yousif Lake near (Ain 42 named Al- Saidaliya) in Khanaqeen area within Diyala governorate. The physical and chemical properties are affecting by many hydrogeological and Hydrochemical aspects. The survey includes the hydrological setting of the geological units including the water-bearing horizons of Fatha and Injana formations. 12 water samples have been taken over one year (2019) and analyzed for major and minor ions for the purpose of water evaluation for Balneotherapy, throughout the spatial distribution maps of TDS and other major and minor ions concentrations. The spring water samples were analyzed for physical parameters like; total dissolved solids (TDS), the electrical conductivity (EC), the acidity pH, temperature. While the chemical parameters include; major cations (Ca^{+2} , Mg^{+2} , Na^{+} and K^{+}), and the major anions (SO_4^{2-} , Cl^{-} , HCO_3^{-} and CO_3^{2-}), in addition to the minor element (NO_3^{-}). The “International Standards of World Health Organization” (WHO) were used to examine the water quality limits. The results revealed warm spring water with average temperature of 22–27.5 °C, which classified as thermal to hypothermal springs. The spring water quality are affecting by the lithology and the climate condition in addition to the geochemical processes. There is high chemical dissolution of gypsum and carbonate evaporates in the study area. According to the physical and chemical analyses; it was found there is a high chance of using Haj Yousif spring water for Balneotherapy purposes and as Geo park site.

Keywords: Balneotherapy, Haj Yousef, Geopark, Saidaliya, Spring.



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Study of *Unio* Philipsson, 1788 (*Bivalvia*, *Unionida*) Shells in Quaternary Deposits, Southern of Iraq

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Abstract

The shells and their characteristics are very useful in Paleobiology and evolutionary biology because they form a rich fossil record. Freshwater mussels form one of the most important groups of mollusks, can dominate the biomass in some freshwaters, and they perform key ecological functions. Shell samples were collected in the north of Nasyriah city- east of Al Warka city, Southern Iraq between longitudes 45° 57 to 45° 45 E and latitudes 31° 26 to 31°18 N. The study area is described as containing a large accumulation of shells with depths of 5 and 6 meters, especially at 6 meter depth. These shells are *Melanoides tuberculata*, *Unio*, and *Corbicula* shells. *Unio* species were used to detect the paleoenvironment in the Quaternary deposits, southern Iraq. According to the XRD diffraction of *Unio* shells results, aragonite and calcite are the dominant minerals. Aragonite in *Unio* shells at 6m is more than 5m, while calcite in *Unio* shells at 5m is more than 6m. As for the XRF analysis, it was found that calcite, silica, magnesium, phosphor, and manganese are the most major oxides in the *Unio* shells, whereas, Sr, Zn, Rb, and Pb are the main trace elements. The high abundance of *Unio* shells at 6m depth gave an indicator to the freshwater environment. The high accumulation shells at 6m gave an indicator to suitable conditions in that period of Quaternary Formation to grow and to provide the appropriate nutrients for reproduction.

Keywords: *Corbicula*, Iraq, Shells, *Melanoides*, *Unio*.



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Wetlands of South Iraq; National Heritage for Saving Human Cultures and Global Environmental Balance

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Abstract

Wetland of South Iraq (locally called Ahwar) are discussed in this study for their evolution, natural characteristics, human settlements and their development to evolve first world civilization as well as their use in present days with case studies to correlate of their character for including the site in the world heritage list. Correlation of the characteristics of this site with the UNESCO criteria of 2005 for selection to be included on the world heritage list are performed in this study. It is concluded from these correlations that this site is of outstanding universal value that meets at least four UNESCO criteria of criteria's 10, 9, 7 and 2 for inclusion on the world heritage list. Accordingly, this site holds the best assessments for inclusion in the world heritage list of mainly natural with cultural archeological materials of the first world civilization under their sediments, and hence should be included.

Keywords: Earliest human settlements, Neolithic cultures, South Iraq, Wetlands, World Heritage.



خلاصات

المؤتمر العلمي الدولي الأول للتاريخ الطبيعي والحياة البرية

24-25 تشرين الثاني 2021

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بسم الله الرحمن الرحيم
السلام عليكم ورحمة الله وبركاته

الحمد لله الذي وفقنا لتنظيم هذا المؤتمر وهو (المؤتمر العلمي الدولي الأول للتأريخ الطبيعي والحياة البرية للمدة من 2021/11/25-24). تحت شعار "حماية الحياة البرية مستقبل الاقتصاد الوطني" تعتبر المتنزهات الجيولوجية الطبيعية (Geopark) ومواقع التراث الجيولوجي والجغرافي (Geoheritag) ذات أهمية ثقافية وعلمية كبيرة حيث يتناغم التنوع الجيولوجي مع التنوع الاحيائي وتسمح بإنشاء أنشطة اقتصادية مستدامة من خلال تنظيمها واستثمارها . وتهتم اليونسكو بزيادة الوعي والمشاركة بدمج الحقائق الجيولوجية المحلية في الشبكة العالمية للحدائق الجيولوجية لتبادل الخبرات على المستوى الدولي بحيث تكون الحديقة الجيولوجية عاملاً مهماً في التنمية الاقتصادية وتوفير البنية التحتية للتنمية السياحة وتنشيطها ، مما سيفتح الطريق أمام إنتاج مصدر جديد للدخل للسكان. هذا هو السبب في أننا نحتفل بترائنا مع الحفاظ على التنوع الثقافي والبيولوجي والجيولوجي وتعزيز التنمية الاقتصادية المستدامة. شارك في هذا المؤتمر اساتذة وباحثون مختصون بعلوم الحياة والبيئة و علوم الارض والعلوم ذات العلاقة من كافة محافظاتنا العزيزة كما شاركنا من الاشقاء العرب، باحثون من ليبيا ومصر وباحثون اجانب من ايران والمانيا والكونغو وايطاليا واندونيسيا وكوريا الجنوبية والولايات المتحدة الامريكية استراليا ونيوزيلندا . لقد كانت هذه المشاركات بمثابة باقات ورد اضافت لعرس مركز بحوث و متحف التاريخ الطبيعي رونقا وبهاء وعكست وحدة العراقيين في ابهى صورها وجسدت حبهم لشعبهم وبلدهم، ومضيهم في طريق العلم والتقدم .

لقد تجاوز عدد الابحاث المشاركة (65) بحثا ودراسة جميعها دقتت من قبل اثنين من المختصين في اللجنة العلمية وبواقع 36 تخصص في علوم الحياة و علوم الأرض حيث شملت مدى واسع من التخصصات كعلم التصنيف و تطبيقاته في خدمة المجتمع والمحميات الطبيعية والتنوع البيولوجي والحفاظ عليها والنظم البيئية و ادارتها والتشريح المقارن للأنواع البرية وأمراض الحياة البرية. كما شملت التخصصات للعلوم الجيولوجية والتنوع الجيولوجي والمتنزهات الجيولوجية والتراث الطبيعي والموارد الطبيعية والاستدامة والتصحر وبواقع 22 بحثا ودراسة. وبذلك يعتبر مؤتمرنا هذا من اكبر المؤتمرات العلمية التي نظمت منذ عقود من الزمن، حيث ضم بحدود 210 باحث مشارك عدا الباحثين الذين لديهم حضور فقط. في الختام ... يسر اللجنة العلمية ان تتقدم بفائق شكرها و عرفانها و امتنانها لكل من له مشاركة أو حضور، ونخص هنا الاخوة والضيوف الذين تجشموا عناء السفر والحضور لعاصمتنا الحبيبة بغداد، والشكر موصول الى الزملاء في اللجنة التحضيرية بكل مسمياتها كاللجنة المشرفة والاستشارية والعلمية والساندة والمالية ... واسال الله تعالى لمؤتمرنا النجاح وتحقيق اهدافه خدمة لعراقنا الحبيب الغالي ان شاءالله تعالى والسلام عليكم ورحمة الله وبركاته



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انطلاقاً من أهمية دراسة التاريخ الطبيعي للأحياء وتنوعها وتأثيرها على الإنسان صحياً واقتصادياً ولأن المعرفة المباشرة بمعيشة الكائنات الحية وأنماط سلوكها و التقصي عن العلاقات الطبيعية فيما بينها وتأثيرها بالمكونات غير حية، و للوقوف على حالة التنوع الاحيائي و تحديد الانواع المهددة بالانقراض وحالة الصون لها باعتبارها جزء مهم من برامج التنمية المستدامة و إيماناً منا بأهمية البحث العلمي في معالجة ذلك و وضع الحلول العلمية المناسبة. استكمالاً للدور المهم لمركز بحوث و متحف التاريخ الطبيعي- جامعة بغداد في دراسة الظواهر البيئية الطارئة و خدمة المجتمع، ولتكون الفائدة المتوخاة أكثر جدية بعيداً عن العمومية الشائعة في المؤتمرات السابقة فقد نضجت فكرة هذا المؤتمر العلمي التخصصي الدولي الاول للتاريخ الطبيعي والحياة البرية، والذي يعد الأول من نوعه على مستوى العراق ليستهدف مشاركة وتبادل الافكار و النشاطات والنتائج البحثية المحلية والعالمية ومناقشة المشاكل ذات الاهتمام والاختصاص المشترك والتي سترتقي بالبحث العلمي وتلبي متطلبات المجتمع لبناء القدرات البحثية الممزوجة بالخبرات الميدانية في مجال الحياة البرية التي تعد من التخصصات العلمية النادرة في العراق والمنطقة الاقليمية.

ان الحفاظ على التنوع الإحيائي يمثل أهمية خاصة من الناحية الأكاديمية والعلمية والصحية، حيث تشير الدراسات الى ان تقلص التنوع الاحيائي يزيد من مخاطر إصابة الإنسان بالكثير من الأمراض المختلفة فضلاً عن اهميته لتنشيط الاقتصاد واستثمار الموارد الطبيعية، وما شهدته مفاهيم السياحة البيئية من تطور حتى اصبحت تشكل مورداً مهماً في الموازنات المالية للعديد من دول العالم، كما يتوجب على الجميع رعاية ومواجهة المخاطر التي تواجهها الطبيعة تجاه الصيد الجائر والزحف العمراني الكبير نحو المساحات الخضراء المحيطة بالمدن و تقلصها بشكل كبير، مما يزيد من مخاطر تلوث الهواء واستنفاد المياه و تنامي التصحر مما يهدد اشكال الحياة برمتها، كذلك لا بد من العمل تشجيع الإنتاج الزراعي الطبيعي بدون استخدام المواد الكيميائية السامة التي تضر بالإنسان والبيئة والعمل على استخدام المواد الطبيعية والأعداء الحيوية في مكافحة الآفات المختلفة، و تفعيل القوانين التي تسهم و تدعم التوازن البيئي ومنع الصيد الجائر وانشاء المحميات و حماية المواقع الطبيعية، وعليه لا بد من تكاتف جهود جميع الباحثين و المختصين للخروج برؤية علمية من خلال هذا المؤتمر ومد جسور السلام للطبيعة والمعمورة التي نعيش عليها برؤية مستدامة لمواردها.

حقق هذا المؤتمر استقطاب العديد الباحثين والخبراء من جامعات وبلدان مختلفة عربية وأجنبية منها: مصر وليبيا والمغرب واليمن فضلاً عن إيران والولايات المتحدة الأمريكية وإسكتلندا وأستراليا وألمانيا وجمهورية الكونغو ورومانيا وكندا. اختتم كلمتي بالشكر والثناء لكل من ساهم في رعاية ودعم المؤتمر، وأخص منهم بالذكر: معالي وزير التعليم العالي والبحث العلمي المحترم و رئاسة جامعة بغداد المتمثلة بالسيد رئيس الجامعة ومساعديه العلمي والاداري المحترمين. راجياً للجميع التقدم والازدهار ... والسلام عليكم ورحمة الله وبركاته.