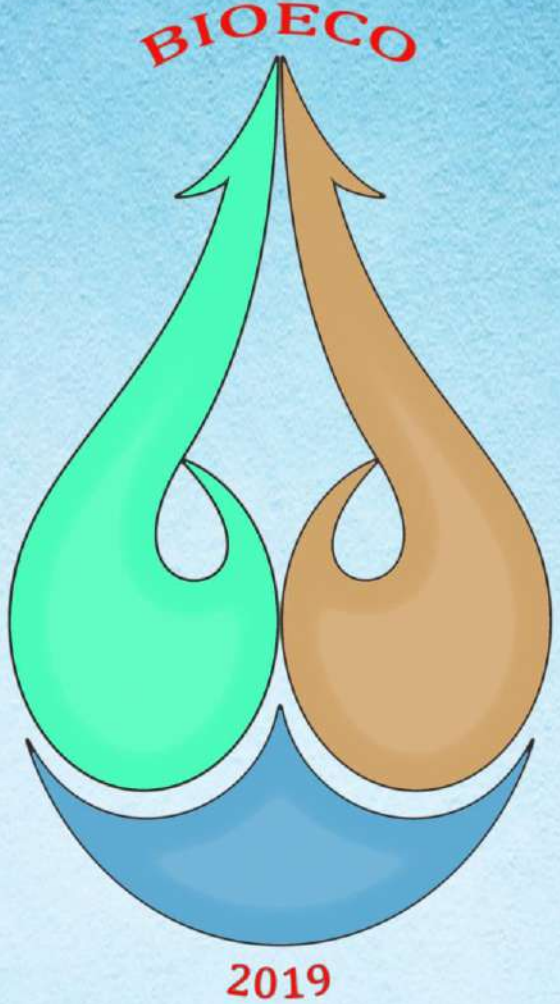
INTERNATIONAL BIODIVERSITY & ECOLOGY SCIENCES SYMPOSIUM PROCEEDINGS (BIOECO2019)

SEPTEMBER 26-28, 2019
İSTANBUL / TURKEY

Edited By
Dr. Tahir ÖZCAN



Palas

No : 1

ISBN: 978-605-80198-0-5 Publication of e-book date: 22.10.2019

INTERNATIONAL BIODIVERSITY & ECOLOGY SCIENCES SYMPOSIUM PROCEEDINGS (BIOECO2019)

Edited by

Tahir Özcan

SEPTEMBER 26-28, 2019
İstanbul / TURKEY

BioEco2019

All rights are reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means without the prior permission from the Palas Academic Organization and Trade Corporation.

Copyright © Palas Academic Organization and Trade Corporation

ISBN: 978-605-80198-0-5

Published E-book on 22.10.2019

Citation: Özcan T (Ed.). 2019. International Biodiverstiy & Ecology Sciences Symposium Proceeding (Bioeco2019), 26-28 September 2019, İstanbul/Turkey. Palas Academic Organization and Trade Corporation, Publication number: 1, İskenderun-Hatay, Turkey, 397 pages.

INTERNATIONAL BIODIVERSITY & ECOLOGY SCIENCES SYMPOSIUM

26-28 SEPTEMBER 2019, ISTANBUL / TURKEY

http://bioeco2019.com/

BioEco2019

***The scientific responsibility of the articles published in this proceedings fully belongs to the authors.**

Corresponding author warranted that • Manuscript is original. • Written and visual materials within the manuscript doesn't contain any copyright infringement, and all legal permissions for them have been taken by the authors. • All authors agreed to publish this study and there is no conflict of interest between authors. • All scientific, ethic and legal responsibility of the published material belongs to author(s). • Supporting authority had been cited.

Day 1 - Thursday, 26 September 2019	
Conference Hall- İstanbul Balo Salonu	
8:00-09:30	Registration of Participants
09:30-10:00	Coffee Break
10:00-10:15	Opening Ceremony
10:15-10:45	Memorial Ceremony for Kapiris Kostas
10:45-11:15	Age determination techniques in the marine gastropods
11:15-11:45	Diversity and ecology of tardigrades
11:45-12:15	Climate induced changes in population Dynamics in the Mediterranean Sea
12:15-14:00	Lunch Break

Theme Section A: Conservation of Biodiversity: Biological and Ecological Aspects in Aquatic Ecosystems	
Freshwater Ecosystems	
Conference Hall- Ankara	
Chairman	Dr. Muhammed Yaşar DÖRTBUDAK
14:00-14:15	Freshawater ichthyodiversity in Iran: Past, present and future trends Hamid Reza Esmaeili
14:15-14:30	Diversity and density of Pleco (*Pterygoplycthys sp*.) in Ciliwung River, Jakarta Indonesia Dewi Elfidasari, Hurunin Fathonah Muthmainah, Fahma Wijayanti
14:30-14:45	First occurrence of *Ligula. sp* in endemic cyprinid *Ladigesocypris irideus* (Ladiges, 1960) From Ula Reservoir (Mugla, Turkey) Somayeh Doosti, Fevzi Yılmaz
14:45-15:00	Relationship of otolith size to standard length of The Prussian Carp *Carassius gibelio* (Bloch, 1782) in Tigris River, Şırnak, Turkey Muhammed Yaşar DÖRTBUDAK, Gülnaz ÖZCAN
15:00-15:15	Relationship of otolith size to standard length of the *Capoeta trutta* (Heckel, 1843) in Tigris River, Şırnak, Turkey Muhammed Yaşar DÖRTBUDAK, Gülnaz ÖZCAN
15:15-15:30	The ancient Lake`s Ohrid and Prespa ecological status- a comparative study Sasho Trajanovski, Biljana B. Gjoreska, Sonja Trajanovska, Konstantin Zdraveski
15:30-16:00	Coffee Break
Theme Section D: Bioindicators and Biomonitoring	
Conference Hall- Ankara	
Chairmen	Dr. Levent Bat
16:00-16:15	Concentrations of toxic elements in mussels *Mytilus galloprovincialis* as bio-indicator of coastal pollution Levent Bat
16:15-16:30	The Contents of Heavy Metals in Plecostomus (Loricariidae) from the Ciliwung River Jakarta, Indonesia Laksmi Nurul Ismi, Dewi Elfidasari, Riris L. Puspitasari, Irawan Sugoro, Afina P. Sabira
16:30-16:45	Variable glochidium prevalence on gills suggests different resistance potential in fish: a preliminary evidence in the fish community of a temperate small stream (Tersakan, Muğla) Ertan Ercan, Neslihan Ağralı, Ali Serhan Tarkan
16:45-17:00	Determination of some species of invertebrate on mussel culture units in Balıklıova, İzmir Bay Serpil SERDAR, Ali ULAŞ, Şükrü YILDIRIM
17:00-17:15	Fishing Competitions in Turkey and Focus on Alaçatı Big Fish Tournament Ali Ulas, Zeynep Güleşci
17:15-17:30	
	Dinner

Theme Section A: Conservation of Biodiversity: Biological and Ecological Aspects in Aquatic Ecosystems	
Conservation of Biological Diversity	
Conference Hall- Bodrum	
Chairman	Dr. Yusuf Bozkurt
14:00-14:15	Cryobanks and their role in conservation of aquatic biodiversity Yusuf Bozkurt
14:15-14:30	Determination of genetic variations of *Carasobarbus luteus* populations living in Euphrates River based on mitochondrial DNA cyt b sequences Arif Parmaksız
14:30-14:45	Isolation and 16S rRNA sequence analysis of six environmental haloversatile bacteria from Çamaltı Saltern Pınar Cağlayan
14:45-15:00	Selective enrichment for clinical strains of *Vibrio vulnificus* based on virulence correlating gene Sedat Cam, Robin Brinkmeyer
15:00-15:15	Effect of environmental factors on biofilm formation by clinical and environmental *Vibrio vulnificus* strains Sedat Cam, Robin Brinkmeyer
15:15-15:30	
15:30-16:00	Coffee Break
Theme Section E: Biological Diversity: its past and prospects	
Conference Hall- Bodrum	
Chairmen	Dr. Nuri Başusta
16:00-16:15	Predicting the impact of climate change on yield and water requirement of rainfed crops in setif region (Algeria) Tarek Bouregaa
16:15-16:30	A Dileptid Ciliate Isolated From Tekirdağ Soils, *Rurikoplites armatus* (Foissner & Schade 2000) Ciliophora: Litostomatea, Rhyncostomatia): Infraciliature and Morphometric Characterization Hilal Ural, İsmail Yıldız, Naciye Gülkız Şenler
16:30-16:45	Diversity and distribution pattern of waterbirds in wetlands of Algerian steppe region Ettayib Bensacı, Asma Zoubiri, Yassine Nouidjem, Fateh Mimeche, , Bilal Gasmi and Menouar Saheb
16:45-17:00	Distribution of the Genus *Garra* Hamilton, 1822 in Anatolia Cüneyt Kaya, Esra Bayçelebi
17:00-17:15	Review of the genus *Gobio* Cuvier, 1816 in Turkey Esra Bayçelebi, Cüneyt Kaya
17:15-17:30	Biodiversity and Varietal Improvement of Drum Wheat (*Triticum durum* Desf.) Yamina Bouatrous
	Dinner

Theme Section B: Biological and Ecological Aspects in Terrestrial Ecosystems	
Population Status, Life Histories, Ecology, Assessment, Conservation and Management of Terrestrial Species	
Conference Hall- Bursa	
Chairman	Dr. Emire Elmas
14:00-14:15	How plant strategy types change in coastal wetland from dune to reeds? Emire Elmas, Sevda Türkiş, Barış Bani
14:15-14:30	Study of soil-vegetation relationships of the forest Ouled Bechih (Souk Ahras) Algéria Ibtissem Samai, Nouha Menadjlia
14:30-14:45	Analysis of vegetal biodiversity under saline conditions Adda Ababou, Abdelkader Bouthiba
14:45-15:00	Biological strategy for the rehabilitation of saline soils in the perspective of sustainable agricultural development. Moulay Belkhodja, Nadia Soualmı
15:00-15:15	The economic value analysis approach to conservation and sustainable use of Biological Diversity: *Fritillaria sp* as a case study Aynur Demir
15:15-15:30	Securing the production of durum wheat (*Triticum durum* desf.) by supplementary irrigation in the semi-arid zone (south of setif province, Algeria): case of the bouscelem variety Cheniti Khalissa, Guessoum Salima, Djouada Lyamine, Belhaouchet Zine Abidine, Mansour Lynda-Maya
15:30-16:00	Coffee Break
Theme Section H: Environmental Management: Renewable Sources, Recycling and Environmental Management	
Environmental Management	
Conference Hall- Bursa	
Chairmen	Dr. Nurçin Killi
16:00-16:15	Stakeholder Analysis of The Artificial Reefs in Edremit Bay (Northern Aegean), Turkey: Contributions to management Sezgin Tunca, Vahdet Ünal, José Luis Sánchez Lizaso
16:15-16:30	Analysis of Biodiversity and Ecological Data by R Software Packages Yusuf Kurt
16:30-16:45	Impact of production systems on salt lakes: Case of the complex Chott Merouane and Melghir (Algeria) Fatma Demnati, Farid Allache, Mounira Zouatine, Naima Mebrek
16:45-17:00	Study approchof a strategy with sustainable development of a Ramsar site: Case Lake Réghaïa, Algeria Mounira Zouatine, Fatma Demnati, Farid Allache
17:00-17:15	The Rising Phenomenon in Turkish Marine Protected Areas: Charter Fishing Sezgin Tunca, Vahdet Ünal
17:15-17:30	First Record of the Starfish Asterina phylactica (Echinodermata: Asteroidea) from the Eastern Mediterranean Aysenur UYSAL, Ertan DAĞLI, Alper DOĞAN
	Dinner

ISBN: 978-605-80198-0-5 Publication of e-book date: 22.10.2019

Day 2 - Friday, 27 September 2019

Theme Section A: Conservation of Biodiversity: Biological and Ecological Aspects in Aquatic Ecosystems

Protection and Management of Aquatic Species

Conference Hall- Ankara

Chairmen	Dr. Halit Filiz
09:00-09:15	What steps should be taken to ensure the protection of sandbar shark, *Carcharhinus plumbeus* , in Turkey ? Halit Filiz, Ertan Taşkavak
09:15-09:30	Mollusc and arthropod shells waste using as qualified materials Fettah Gündüz, Fatma Öztürk, Hatice Gündüz
09:30-09:45	Extraction of collagen and gelatine from invasive toxic pufferfish specie *Lagocephalus scelaratus* in Mediterranean sea (Iskenderun Bay) and their possible uses in different sectors Yasmin YILDIZ, Mevlüt AKTAŞ
09:45-10:00	Is the Gediz River Basin Suitable for Breeding and Populating of the Red Eared Slider, *Trachemys scripta elegans* ? Special emphasis to some Observations on the Overwintering Hatchlings of Terrapins at Western Turkey Ertan Taşkavak, Ragıp Balatlı, Halit Filiz
10:00-10:15	Attention please! *Pinna nobilis* in great danger Sefa Acarlı
10:15-10:30	Citizen Science Approach in North Macedonia - Protect Rare Snails from Lake Ohrid - an Innovative Approach to Biodiversity Conservation Konstantin Zdravevski, Sasho Trajanovski, Biljana B. Gioreska, Sonja Trajanovska
10:30-11:00	Coffee Break

Theme Section B: Biological and Ecological Aspects in Terrestrial Ecosystems

Terrestrial ecology and biodiversity in a changing Eurasia

Conference Hall- Bodrum

Chairmen	Dr. Güley Kurt
09:00-09:15	Plant Biodiversity of the Vark Watershed of Lorestan province, Iran Hamed Khodayari, Khadijeh Shekari
09:15-09:30	Floristic diversity and composition of the Roomeshkan county, Lorestan province, Iran Hamed Khodayari, Zahra Farajollahi
09:30-09:45	Characterization of new strains belonging to the defoliant pathotype of *Verticillium dahliae* from the cultivated olive tree in Algeria. Benzina- Tihar F., Reghmit AB., Sahir-Halouane F., Oulebsir-Mohand Kaci
09:45-10:00	The species of the genus Calligonum L. in the Ustyurt Tajetdinova Dilarom Mnajatdinovna
10:00-10:15	A Phytosociological research on the surroundings of Sürgü Dam (Sürgü / Doğanşehir / Malatya) Hatice Tosyagülü Çelik, Ömer Faruk Kaya
10:15-10:30	
10:30-11:00	Coffee Break

Theme Section E: Biological Diversity: its past and prospects

Conference Hall- Bursa

Chairmen	Dr. Tevfik Ceyhan
09:00-09:15	Active biomonitoring of mussels *Mytilus galloprovincialis* with integrated use of micronucleus assay and physiological indices to assess Hamida Gherras, Chafika Hebbar, Mohammed Bouderbala
09:15-09:30	Morphometric characteristics of *patella* species in Al-Hanya coast, eastern Libya Mediterranean Sea Salleemah Hasan Hamad, Sayed Mohamed Ali, Ramadan A. S. Ali, Eman S. Alfergani
09:30-09:45	Larval Helminths in *Helix lucorum* Linnaeus, 1758 in Some Regions of Georgia Lela Arabuli , Lali Murvanidze , Tsitsino Lomidze , Ketino Nikolaishvili ,
09:45-10:00	Temporal variation of Gastropoda and Scaphopoda (Mollusca) species along the Sugözü coast (Iskenderun Bay, Levantine Sea) Banu Bitlis, Bilal Öztürk
10:00-10:15	Beneficial Roles of Freshwater Mussels in the Ecosystem Hülya Şereflişan, Ece Kılıç
10:15-10:30	
10:30-11:00	Coffee Break

Theme Section A: Conservation of Biodiversity: Biological and Ecological Aspects in Aquatic Ecosystems

Population status, life histories, ecology of aquatic species

Conference Hall- Ankara

Chairmen	Dr. Naime Arslan
11:00-11:15	Levels of some trace elements (cadmium, lead, mercury and chromium) in water and planktonic organisms in Abant Lake (Bolu, Turkey) Tahir Ateş, Naime Arslan, Deniz Mercan
11:15-11:30	A preliminary Observation on Relationships of the Liver, Ovary and Body Weights for Short snouted seahorse, *Hippocampus hippocampus* at the Tirebolu Coasts (Black Sea) Sule GURKAN, Ertan TASKAVAK, Burcu TAYLAN, Arzu AYDIN UNCUMUSAOGLU
11:30-11:45	An investigation on the gravid females and embriyos of Gymnura altavela from Yumurtalik Bight, Iskenderun Bay (Turkey Nuri Başusta, Asiye Başusta
11:45-12:00	Age and Growth of a Mullidae: *Mullus barbatus* (Linnaeus, 1758) caught in the Algerian West Coasts Hebbar Chafika, Gherras Hamida
12:00-12:15	Spatio-temporal variation in distribution and abundance of marine Cladocerans in relation to environmental factors in Güllük Bay (Aegean Sea, SW Turkey) Nurçin Killi, Ali Serhan Tarkan
12:15-12:30	The Nutritional Value of Smooth Scallop Pervin Vural, Sefa Acarlı
12:30-14:00	Lunch Break

Theme Section A: Conservation of Biodiversity: Biological and Ecological Aspects in Aquatic Ecosystems

Population status, life histories, ecology of aquatic species

Conference Hall- Bodrum

Chairmen	Dr. Ali Serkan Tarkan
11:00-11:15	Annual variation in the abundance of prokaryotic picoplankton (*Synechococcus* and *Prochlorococcus*) in the Northeastern Ece Kılıç, Nebil Yücel, Zahit Uysal
11:15-11:30	A new application of the Micronucleus Test on Zooplankton: from lab to field Sabria Barka, Zouhour Ouanes-Ben Othmen, Abir Gharbi[1] Imen Gdara,
11:30-11:45	Gill Histopathology in the Marine Fish *Psetta maxima* After Acute Exposure to Cypermethrin Serhat Engin
11:45-12:00	Ladigesocypris sp. (Ladiges, 1960= complex: current status of knowledge and implicaitons for conservation of these Cyprinids species Daniella Giannetto, Somayeh Doosti, Ali Serhan Tarkan, Fevzi Yılmaz
12:00-12:15	
12:15-12:30	
12:30-14:00	Lunch Break

Theme Section E: Biological Diversity: its past and prospects

Conference Hall- Bursa

Chairmen	Dr.Łukasz Kaczmarek
11:00-11:15	Biodiversity and honey bee diseases in Algeria Wahida Loucif-Ayad
11:15-11:30	Susceptibility of two whitefly (*Bemisia tabaci*) (Hemiptera: Aleyrodidae) strains to insecticides from Oman Naser Nasser Hamoud Al-Rawahi, Ismail Abdullah Al-Siyabi, Riaz Shah
11:30-11:45	Diversity and host associations of aphid parasitoids (Hymenoptera: Braconidae: Aphidiinae) in non-cultivated areas of Khenchela Province –East Algeria Hayet Aggoun, Laamari Malik,Tahar chaouche Souad
11:45-12:00	Tiger beetles in the Mediterranean Region – flagship bioindicators in perfect hot-spot area Radomir Jaskula
12:00-12:15	Population Dynamism Of Black Scorpion (*Androctonus Crassicauda* (Olivier, 1807; Scorpiones: Buthidae) İn Şanlıurfa Province Nevin ASLAN, Şahin TOPRAK
12:15-12:30	Study of the Insecticidal Activity of *Taxus baccata* of the Ifrane valley on *Sitophilus oryzae* (L.) (Coleoptera: Curculionidae) Amechrouq Ali, Riffi Ouassima, Elhourri Mohammed, El idrissi Mostafa, Fliou Jamila
12:30-14:00	Lunch Break

Theme Section H: Environmental Management: Renewable Sources, Recycling and Environmental Management

Environmental Management and Pollution Prevention

Conference Hall- Ankara

Chairman	Dr. Banu Kutlu
14:00-14:15	Investigation of Statistical Experimental Design Results of UV Absorbance Values of Aluminium Nanoparticles of Different Sizes Mehmet Ateş, Banu Kutlu, Önder Aksu, Durali Danabaş, Işıl Canan Çiçek-Çimen, İlkay Ünal, Burcu Ertit Taştan
14:15-14:30	Applied of a new bacterial species isolated from an activated sludge in the denitrification treatment of the wastewater Yassmina Angar, Salima Gana-Kebbouche, Nacer-Eddine Djelali, Souad Talbi-Khemili
14:30-14:45	The Effect of Remote Monitoring Methods in The Fight Against Marine Pollution Şebnem Erkebay, Cem Erkebay
14:45-15:00	Analysis and Comparison of Risk Factors In The Installation And Design of Potable Water Treatment Plants Şebnem Erkebay, Cem Erkebay, Arzu Morkoyunlu Yüce
15:00-15:15	Investigation of the effects of Giardia lamblia and Cryptosporidium parvum on environmental pollution by real-time PCR in horse farms in Southeastern Anatolia Akın Yiğin, Mehmet Demirci, Hikmet Dinç
15:15-15:30	
15:30-16:00	Coffee Break

Theme Section E: Biological Diversity: its past and prospects

Conference Hall- Bodrum

Chairman	Dr. Kerim Çiçek
14:00-14:15	Preliminary Researches on Tardigrada Fauna of Meşelik Campus (Eskişehir, Turkey) Naime Arslan, Akın Karahasan, Deniz Mercan
14:15-14:30	Furan induces cytotoxicity, oxidative stress and apoptosis in Leydig cells Yasemin Ülkü Dikbasan, Yasemin Aydın
14:30-14:45	Nocturnal Activity of *Anatololacerta pelasgiana* (Mertens, 1959) from Çığlıkara Nature Reserve, Antalya, Turkey Batuhan Yaman YAKIN, Kerim Çiçek, Murat Afsar, Cemal Varol TOK
14:45-15:00	Another Case of Piebaldism in *Blanus strauchi* (Bedriaga, 1884) from Kaş, Turkey Batuhan Yaman Yakın, Ulvi Kerem Günay, Kerim Çiçek, Dinçer Ayaz, Cemal Varol Tok
15:00-15:15	An Investigation of How Aquatic Beetles (Arthropoda:Insecta) Effect on Water Quality of Riva Stream (Istanbul) Nilay Dökümcü, Serap Koşal Şahin
15:15-15:30	
15:30-16:00	Coffee Break

Theme Section A: Conservation of Biodiversity: Biological and Ecological Aspects in Aquatic Ecosystems

Mediterranean Sea: Past, present and future changes of alien species

Conference Hall- Bursa

Chairman	Dr. Esmail E. Shakman
14:00-14:15	Dangers of Invasive Fish Species, Prevention and Control Zehra Arzu BECER, Edafe ODIOKO
14:15-14:30	Adapted Seagrass Watch Protocol to evaluate *Posidonia oceanica* health, in the Eastern Aegean Sea Clara Gütte, Sarah Meek, Ute Hansen, Anastasia Miliou
14:30-14:45	The importance of *Sipuncula* species in marine ecosystems Şermin Açik
14:45-15:00	Sipunculans associated with *Posidonia oceanica* (L.) Delile 1813 in Izmir Bay (Aegean Sea, Eastern Mediterranean) Şermin Açik
15:00-15:15	Marine Parasites *Gnathia sp* (Gnathiidae) of the Libyan fishes along the western coast of Libya Sarah ben Zeglam, Esmail A. Shakman
15:15-15:30	The role of constructed wetlands in conservation of biodiversity;A case study on birds diversity in Al-Hadba treatment plant, Libya Aya ALGADRY, Esra'a DORMAN, Essam BOURASS and Khaled
15:30-16:00	Coffee Break

Theme Section H: Environmental Management: Renewable Sources, Recycling and Environmental Management

Environmental Management

Conference Hall- Ankara

Chairmen	Dr.Zafer Tosunoğlu
16:00-16:15	The semi-electronic fish auction: an innovation, developed by Urla-Iskele (Izmir, Turkey) Fishery Cooperative Kaan Taşkan, Okan Akyol, Zafer Tosunoğlu
16:15-16:30	Comparison of Turkish and EU legislation for fishing gear used in small-scale fishery Zafer Tosunoğlu, Harun Güçlüsoy
16:30-16:45	Slipping practises in Turkish purse seine fishery Zafer Tosunoğlu, Nazlı Kasapoğlu
16:45-17:00	Analysis of the small-scale fisheries landings in the Foça MPA (Turkey) for the second half of Harun Güçlüsoy, Zafer Tosunoğlu
17:00-17:15	Analysis of the trawl landings in Foça (Turkey) for the second half of 1990s Harun Güçlüsoy, Zafer Tosunoğlu
17:15-17:30	
17:30-18:00	Coffee Break

Theme Section A: Conservation of Biodiversity: Biological and Ecological Aspects in Aquatic Ecosystems

Tell the Black Sea: from individuals to Ecosystems

Conference Hall- Bodrum

Chairmen	Dr. Derya Ürkmez
16:00-16:15	The first *Xennella* Cobb, 1920 (Nematoda: Xenellidae) specimen from the Black Sea Derya Ürkmez
16:15-16:30	Effects of Astaxanthine, Canthaxanthin and Lycopene Containing Diets on the Chemical Quality and Textural Properties of the Black Sea Trout (*Salmo labrax*) Fillets Ekrem Çem Çankırılıgil, Nermin Berik
16:30-16:45	Pattern of *Lingulodinium polyedra* cyst distribution in the Black Sea Nina Dzhembekova, Fernando Rubino, Snejana Moncheva, Nataliya Slabakova, Petya Ivanova, Elitsa Stefanova
16:45-17:00	Penetration of the Pacific Korean rockfish *Sebastes schlegelii* into the Evgeniia Karpova, Igor Tamoykin, Vyacheslav Kuleshov
17:00-17:15	
17:15-17:30	
17:30-18:00	Coffee Break

Conference Hall- İstanbul Balo Salonu

18:00-19:00	**Conclusion Meeting**
	Dinner

Conference Hall- İstanbul Balo Salonu

18:00-19:00	**Conclusion Meeting**
	Dinner

Conference Hall- İstanbul Balo Salonu

18:00-19:00	**Conclusion Meeting**
	Dinner

Day 3 - Saturday, 28 September 2019

9:30-14:00	Istanbul Bosphourus Cruise
	Leaving Istanbul

ORAL PRESENTATIONS

BioEco

BioEco2019- International Biodiversity & Ecology Sciences Symposium
ISBN: 978-605-80198-0-5 Publication of e-book date: 22.10.2019

ORAL PRESENTATION

Diversity and Density of Pleco (*Pterygoplycthys* sp) in Ciliwung River, Jakarta Indonesia

Dewi Elfidasari[1*], Hurunin Fathonah Muthmainah[2], Fahma Wijayanti[2]

[1]Department of Biology, Faculty of Science and Technology, University of Al Azhar Indonesia., Jl. Sisingamangaraja Kebayoran Baru, Jakarta Selatan 12110, Indonesia.
[2]Departement of Biology, Science and Technology Faculty Syarif Hidayatullah State Islamic University Jakarta, Jl Ir. H. Juanda No. 95 Cempaka Putih Ciputat Timur Tangerang Selatan
**Corresponding author: d_elfidasari@uai.ac.id Phone: +82 2172792753 ext 212*

Abstract

There has been a lot of information about some species of fishes, plants, insects, planktons, river quality, including heavy metal concentrations from organisms, water and sediment, from some research in Ciliwung River since 2008. But, there is still very limited data that related to the diversity and density of pleco in the Ciliwung River. Pleco is a native species from Costarica, Panama and South America and it's known as an invasive species which is potentially to reduce local biodiversity by eliminating local species of fishes in Ciliwung rivers. The aims of this study is to analyzing the diversity and density of pleco from Ciliwung River in the Jakarta area. Purposive sampling was used with a consideration that the three points represent the presence of pleco. The location of sampling was the Ciliwung river in Jakarta which flows along the Cawang-Condet. Sampling has been done using 4x2 m^2 cast nets with a 2.5-inch mesh size. The sampling activity was carried out in 09.00-15.00 AM. The results showed that the index diversity of pleco in the Ciliwung river in Jakarta was low, which was equal to H'= 0 because there is only one species of pleco was found there, *Pterygoplichthys pardalis*. The population density of pleco in the Ciliwung river in Jakarta was 58 individuals/m^2.

Keywords: *Pterygoplichthys pardalis*, native species, index diversity, population density, Ciliwung river Jakarta

Introduction

Pleco is a suckermouth armored catfish that is found in Ciliwung River in large quantities. It is an introductory species from Costarica, Panama and South America as an object of commercial ornamental fishes in Indonesia (Zworykin & Budaev, 2013). Pleco is also known as invasive species, which can be predators and competitors of local species (Hill & Lodge, 1999), potentially spread parasites and pathogens in their habitats (Torchin, et al., 2003), can cause unexpected hybridization (Mallet, 2007), and potential to reduce local biodiversity by eliminating local species of fishes (Chapin , *et al*., 2000).

The decline in number of the fish species in Ciliwung River has been happening since 2009. It is noted that there were found 20 fish species in 1910 on the river. One of the main role factors towards the decline of the fish species in Ciliwung River is the existence of pleco that is relatively able to adapt to the river's condition that is polluted and no other predators that hunt them. Pleco in Ciliwung River is categorized as introduced fish that is able to dominate the river, this is supported by its body morphology structure. It has a flat body, all covered with hard scales but its abdomen, it has a wide head and jaw. The main characteristic of this *loricariidae* group is that they have a sucker mouth. The shape of its mouth and

BioEco2019

lips enable them to feed, breathe, and be attached to an object through sucking. The sucker mouth in pleco enables them to adhere to an object surround them, even on swift stream rivers. Its mouth and lips are also adapted to any kinds of food such as algae, invertebrate, and detritus (Geerinckx, 2007). Pleco has spiky *adifose fin*, wide back fin, and brown or grey body with black spots on its entire body (Kottelat *et al.*, 1993).

Pleco has a high capability of adaptation in Ciliwung River that have high level of pollutin as it has two respiratory systems. Their main respiratory system is the gill that is used when they are in clean water. Another is a labyrinth that enables them to live in low oxygen and polluted water (Graham, 1997). The existence of pleco can be identified from holes in the form of cluster along the slopes of Ciliwung River. The holes are functioned as a place to lay their eggs (Nico *et al.*, 2012).

The diversity of pleco in Ciliwung River has been researched since 2016 using some methods, such as morphology, morphometric, meristic, and molecular analysis (Elfidasari et al. 2016a, Elfidasari et al. 2016b, Qoyyimah et al. 2016, Rosnaeni et al. 2017). From the aforementioned research, there has no data with regards to diversity and density index data of pleco in the areas. Therefore, there is a need to do research to calculate the diversity and density index of pleco in Ciliwung River Jakarta.

Material and Methods

Pleco Sampling at the Ciliwung River Stream Area

Sampling have been done along Cawang-Condet area of Ciliwung River and based on the planned stations. The samples were taken using three repetitions in different weeks. The sample collection used purposive sampling method, a technique to decide samples purposively based on certain considerations. The plecos was collected using nets around 4x2 m^2 with the size of the eye nets is 2,5 inch. The nets were spread in the morning from 09.00-15.00 WIB which was refered by Nico (2010).

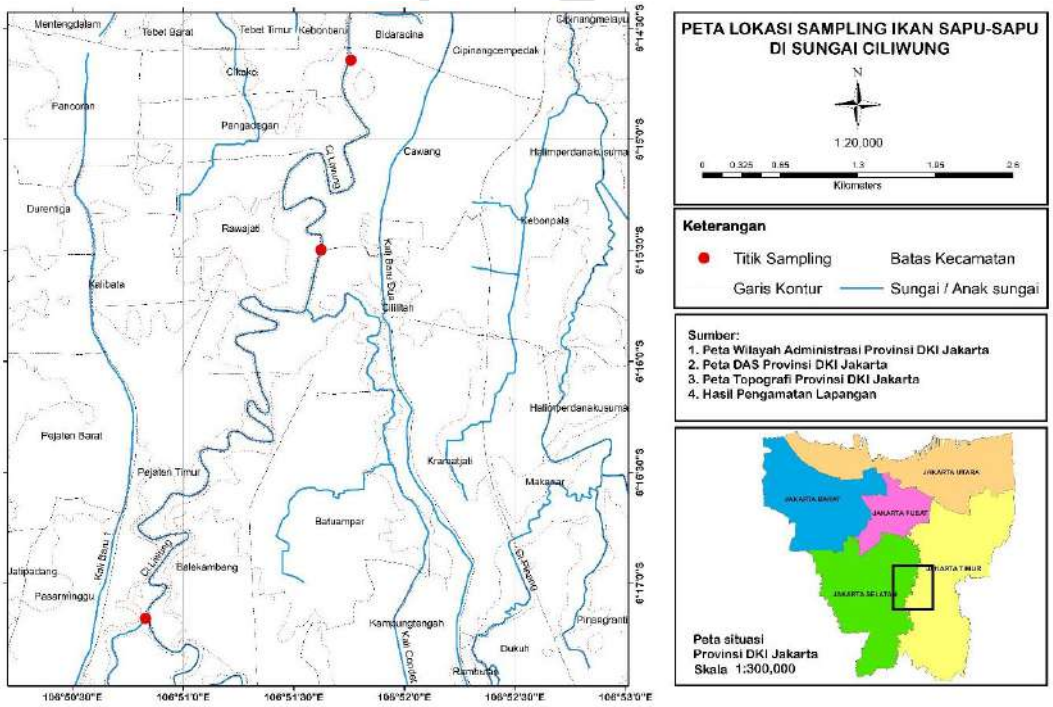


Figure 3. Three observation and sampling station along Cawang-Condet of Ciliwung River

The consideration from this method was the coordinate which represented the existence of pleco based on the information from pleco fishermen and local citizens. There were three observation stations

from each coordinate, namely S 06.244053°-E 106.862654º at the first station, S 06.25830°-E 106.86040° at the second station and S 06.28599°-E 106.84717° at the third station (Figure 3). The coordinates were determined using purposive sampling method in consideration that samples collection along Cawang-Condet of Ciliwung River is regarded as a higly polluted area. In every coordinate, samples were collected in consideration that the samples caught from the nets were placed in every coordinate.

The Identification of Pleco Species at the River Stream Area of Ciliwung

The identification has been done at the Center of Integrated Laboratory UIN Syarif Hidayatullah Jakarta by identifying morphology characteristics of pleco that have been caught by the nets. The specimen was preserved in an 70% alcohol solution. The specimen labels used its scientific names, its caught places, and its collection dates. The identification of pleco specimen at the River Stream Area of Ciliwung used some methods by looking at the patterns of head, lateral, and abdomen. This research was conducted by looking at the pattern of its abdomen which is the salient morphology characteristic of pleco. This happens because the samples have spots patterns or vermicularis on its ventral (Armbruster & Page, 2006). The pleco species identification refer to the book of fish identification from Kottelat *et al*., (1993) and other secondary data from scientific journals.

The Diversity of Pleco Types at the River Stream Area of Ciliwung

The relationship between the number of types and individuals can be stated in Diversity Index. To determine the fish diversity, Shannon-Wiener index was employed (Ludwig dan Reynold, 1988):

$H' = -\Sigma\ pi \ln pi$

Notes:

H’ = Shannon-Wiener Diversity Index
n = The number (i) of individual species
N = The number of individuals from all species

The scoring cirterion based on diversity types is:

H’ < 1 = Low diversity
1 < H’ < 3 = Moderate diversity
H’ > 3 = High diversity

The Density of Pleco at the River Stream Area of Ciliwung

The density of pleco is calculated using the following formula (Barus, 2004):

$Di = Xi / Ni$

Notes:
Di = Density (individual/m)
Xi = Total number of individual
Ni = Total number of area

Results

The diversity index calculation result towards 1.401 plecos gained from the three locations at Ciliwung River, resulted in the value of H’ equal to 0 (zero). It can be stated that the diversity of pleco in Ciliwung River is low. The Diversity Index (H’) is categorized low if, based on the identification result, it is only found one species of pleco in the three locations along the river stream area of Ciliwung River in Jakarta, namely *Pterygoplichthys pardalis*.

Morphologically, pleco’s abdomen has big white spots pattern with merged patterns that are attached together to its sucker-mouth beneath (Page & Robins, 2006). Rosnaeni, et al. (2017) research is a

DNA analysis of *barcodes* CO1 in the fragment's length of 650bp supports the identification result of *Pterygoplichthys pardalis,* that even though there are diverse abdomen patterns of the found plecos, all is from one species that is *P. pardalis*.

Identification result of the abdomen pattern on plecos from the three locations of Ciliwung River shows matched result with the research conducted by Wu *et al.* (2011). The pleco species in Indonesia has a different abdomen pattern. *P. pardalis* has black spots abdomen pattern (in the shape of commas or dots), *P. disjunctivus* has curved patterns, meanwhile the inter-grade species has a combination pattern between inter-grade or hybrid species. The three different patterns of the abdomen can be characterized as one type of pleco in the family of *Loricariidae* that is *P. Pardalis.*

Two different patterns on its head (geometrical light stripes pattern and spots and blotches patterns) that could be identified by Armbruster and Page (2006) show that the two characteristics are the morphological characteristics of *P. Pardalis* species. The difference in the two lateral patterns (merged patterns forming chevrons (<) and separated patterns and do not create *chevrons*) also shows the morphological characteristic of *P. Pardalis* species. The result is supported by a statement that the different patterns between the abdomen patterns on pleco are not the main characters to identify the type of pleco (Rosnaeni, et al., 2017).

Density of pleco population in Ciliwung River in the three locations results in different values. At the first station, it has the density value of 58 ind/m^2, at the second station it has the density value of 80 ind/m^2 and at the third station it has the density value of 36 ind/m^2. The average number of pleco density population in Ciliwung River is 58 individu/m^2. This shows that the density of pleco in this research is higher than the number of population that was found in Halwa's research (2016) that was 22 individuals.

The biggest density value was found at the second station that is around 80 ind/m^2, meanwhile the lowest is at the third station for only 36 ind/m^2. The biggest density value at the second station is caused by the number of individual species of *Poecilia reticulate* and *Mystacoleucus marginatus* is lower than the number of individuals at the first and the third stations. It is caused by the interaction between pleco and the species of *Poecilia reticulate* and *Mystacoleucus marginatus*. An interaction occurred in a population can be in the form of competition if among organisms from the same or different type use the same resource. If an organism uses the same resources, then every organism has to compete to feed themselves to survive and to grow.

The abundant number of pleco in Ciliwung River is probably due to an excellent interspecific competition in taking advantages of food resources with other fish in Ciliwung River such as *Poecilia reticulate* and *Mystacoleucus marginatus*. Supported with a statement coming from Josefsson and Andersson (2001), the aggressive characteristic to get food performed by *Pterygoplichthys pardalis* when they were present at certain locations so that they could change another community in a water area may cause the decline of fish and invertebrate populations.

According to De-Merona (2004), the fish population number is also affected by the number of food resources in the water. Pambudi et al (2016) states that there are 5.834 individuals of phytoplankton. This shows that the fish population in every station is influenced by the existence of phytoplankton in Ciliwung River. The biggest population number is gained at the second station for 80 ind/m^2 because the water condition is at its optimum point for the life of phytoplankton. The condition is influenced by the speed of the stream. At the second station, the speed of the stream is found lower than the first and third stations. According to (1988) a water area that is relatively placid is suitable for the habitat of phytoplankton. For the number of stream speed at the second station is 0,4 m/s lower than the first station for 1,5 m/s and the third for 2,1 m/s so that at the second station, it has a relatively placid stream. A research by Pambudi, et al. (2016) figures out that most phytoplantons in Ciliwung River are highly-tolerated phytoplankton such as *Navicula*, *Nitzschia*, *Synedra*, *Cymbella*, and *Fragilaria*.

According to Krebs (1972), the existence of a fish in a water area is heavily influenced by the presence of predators. The pleco's body has several adaptations to predators that have hard bones and are able to regenerate its pectoral, so that pleco is not hunted by other fish living in Ciliwung River and become the competitor by original fish to get some food, additionally to its life cycle (Sinha, et al., 2010). The research results of Rice *et al*. (2007) and Power (1984) state that a predator from *P. pardalis* species is not from other fish type but from reptiles such as snakes and freshwater turtles, birds, and also human (Aguiar & Di-Beernardo, 2004) (Bonino *et al*., 2009) (Nico, 2010).

The cause of the high density of pleco for 80 ind/m^2 in Ciliwung River at the second station is because few local people along the riverbank to do activities of fishing or catching fishes compared to the first and third stations. For instance, the act of catching fish commercially to invasive fish of *Pterois volitans* has proven to help inhibit the *Pterois volitans* fish population growth (Barbour *et al.*, 2011).

Cause of the high density of pleco in Ciliwung River at the third station is the low number of predator individuals. It is proven by a research by Rusmendero, et al (2009) that describes no finding of bird prey based on the composition analysis of bird types at Kalibata Station and at other stations in South Jakarta. The low number of pleco predators at the three stations enable pleco at the third station to have high density.

Acknowledgements

Thank you to the Ministry of Research and Higher Education that has funded the University Excellent Applied Research in the year of 2018 and University of Al Azhar Indonesia Grant International Seminar 2019 that has funded to become presenter in BioEco 2019 Symposium in Istanbul Turki. Thank you to all parties that have helped out the research from the beginning of the research until the sampling activity and also this paper writing.

References

Barbour A B, Allen S M, Frazer K T, Sherman D K. 2011. Evaluating the Potential Efficacy of Invasive Lionfish (*Pterois volitans*) Removals. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0019666

Bonino M, Lescano N J, Haro G J & Leynaud C G. 2009. Diet of Hydromedusa tectifera (Testudines-Chelidae) in a mountain stream of Córdoba province, Argentina. Amphibia-Reptilia 30(4):545-554

Armbruster, J.W., Page, L.M. (2006):Redescription of Pterygoplichthyspunctatusand description of a new species of Pterygoplichthys(Siluriformes: Loricariidae). Neotropical Ichthyology.4(4): 401-409

Barus, T. A. 2004. Pengantar Limnologi Studi Tentang Ekosistem Air Daratan. Medan: USU Press.

Chapin F S, Sala O. E, Bruke C I & Roy J. 2000. Ecosystem Consequences of Changing Biodiversity. BioScience 48(1).

Elfidasari D, Qoyyimah D F, Fahmi R M. 2016. Morphometric And Meristic Of Common Pleco (Loricariidae)On Ciliwung River Watershed South Jakarta Region. International Journal of Advanced Research 4(12):57-62.

Geerinckx T, Brunain M, Herrel A, Adriaens D. 2007. A head with a suckermouth: A functional-morphological study of the head of the suckermouth armoured catfish Ancistrus cf. triradiatus (Loricariidae, Siluriformes). Belgian Journal of Zoology 137(1).

Hill, A. M & Lodge, D.M. 1999. Replecemant of resident crayfishes by an exotic predation in species replacemat among crayfish. Ecological Application 9 678-690.

Josefsson and Andersson (2001),

Kottelat, M., A.J. Whitten, S.N. Kartikasari and S. Wirjoatmodjo, 1993. Freshwater fishes of Western Indonesia and Sulawesi. Periplus Editions.

Krebs. 1972. Krebs, C.J. 1972. Ecology. *The Experimental Analysis of Distribution and Abundance*. Harper and Row, New York. 694.

Ludwig, J.A. and Reynolds, J.F. (1988) Statistical Ecology A Primer on Methods and Computing. Wiley-Interscience Pub., New York.

Mallet J. 2007. Hybrid speciation. *Nature* 446:279–283 (15 March 2007)

Nico LG, Butt PL, Johnston GR, Jelks HL, Kail M, Walsh SJ. 2012. Discovery of South American armored catfish (Loricariidae, Pterygoplichthys spp.) in The Santa Fe River drainage, Suwannee River Basin, USA. BioInvasions Record. 3 :179-200.

Page, L.M., Robins, R.H. (2006): Identification of sailfin catfishes (Teleostei:Loricariidae) in south-eastern Asia. The Raffles Bulletin of Zoology. 54(2):455-457.

Qoyyimah, F.D., Elfidasari, E., Fahmi, M.R. (2016): Identifikasi ikan sapu-sapu (Loricariidae) berdasarkan karakter pola abdomen di perairan Ciliwung. Jurnal Biologi., 20(1). Rice. 2007.

Rosnaeni, Elfidasari D, Fahmi R M. 2017. Dna Barcodes Of The Pleco (Loricariidae, Pterygoplichthys) In The Ciliwung River. International Journal Of Advanced Research 5(2):33-45

Torchin M, Lafferty K, Dobson A P & Kuris A. 2003. Introduced species and their missing parasites. Nature 421(6923):628-30

Wu, L.W., Liu, C.C., Lin, S.M. (2011): Identification of exotic Sailfin Catfish species (Pterygoplichthys, Loricariidae) in Taiwan based on morphology and mtDNA sequences. Zoological Studies. 50(2):235-246.

Zworykin & Budaev. 2013. Non-indigenous armoured catfish in Vietnam: Invasion and systematics. Ichthyological Research 60(4):327-333.

BioEco2019

ISBN: 978-605-80198-0-5 Publication of e-book date: 22.10.2019

ISBN: 978-605-80198-0-5 Publication of e-book date: 22.10.2019