

**Name: Eyal Kurzbaum**

**Date: 28.12.2017**

## **CURRICULUM VITAE**

### 1. **Personal Details**

Permanent Home Address: Degania A', ZIP code 15120

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Year of birth: 1977

### 2. **Higher Education**

#### a. **Undergraduate and Graduate Studies**

<b>Period of Study</b>	<b>Name of Institution and Department</b>	<b>Degree</b>
2004	Tel-Hai Academic College, Israel. Faculty of Sciences and Technology, Biotechnology and Environmental sciences	B.Sc.
2007	Tel Aviv University, Israel. Faculty of Life sciences, Department of Plant sciences, Ecology and environmental quality sciences.	M.Sc.
2011	Technion-Israel Institute of Technology, Israel. Faculty of Civil & Environmental Engineering, Division of Environmental, Water & Agricultural Engineering.	PhD

#### b. **Post-Doctoral Studies**

<b>Period of Study</b>	<b>Name of Institution and Department/Lab</b>	<b>Name of Host</b>
2013	Israel Oceanographic & Limnological Research, The Yigal Allon Kinneret Limnological Laboratory.	Dr. Werner Eckert (IOLR).

### 3. Academic Ranks and Tenure in Institutes of Higher Education

Years	Name of Institution and Department	Rank/Position
2013-2017	Shamir Research Institute	Researcher

### 4. Offices in Academic Administration

Years	Name of Institution and Department	Role
2013-2015	Water Sciences Center, Youth Academic Center Kinneret college.	Head of program
2011-2013	Water Technologies Dept., Practical Engineering, Ohalo Academic College.	Head of department

### 5. Scholarly Positions and Activities outside the University

Years	Memberships in Academic Professional Associations
2006	Phycological Society of America (PSA)
2004-2010	Israeli Society of Ecology and Environmental Sciences
2009	Israeli Space Society
2009-12.2017	Israel Society for Microbiology (ISM)
2010, 2014	Israeli water association
2016-12.2017	Israel Association for Water Resources
2012, 2006	The Israeli Association for Aquatic Studies

Years	Editorial Assignments
2011-2013	In charge of the Departmental Seminar, Israel Oceanographic & Limnological Research, The Yigal Allon Kinneret Limnological Laboratory, Israel.
2017	In charge of the institutional Seminars, Shamir research institute, University of Haifa.

Years	Reviewing for Refereed Journal
2011-2014	<i>International Journal of Water Resources and Environmental Engineering, Journal of Plant Breeding and Crop Science, European Journal of Phycology, Environmental Technology</i>
2015	<i>International Journal of Phytoremediation,</i>
2016	<i>Water SA</i>
2017	<i>Journal of Hazardous Materials</i>

<b>Years</b>	<b>Professional consulting</b>
2010-2017	<ol style="list-style-type: none"> <li>1. CTG Holding Ltd., TEL MOND, Israel. Subject: Drinking water treatment.</li> <li>2. BioCastle, Israel. Subject: Wastewater microbiology.</li> <li>3. Hydroflow Ltd., USA. Subject: Water disinfection using electromagnetic field.</li> <li>4. BioCastle, Israel. Subject: Microbial encapsulation in wastewater treatment.</li> <li>5. Terra Green, Israel. Subject: Beneficial effects of rhizosphere microbial cultures for the Nitrogen fixation in plants</li> </ol>

## 6. Active Participation in Scholarly Conferences

### a1. International Conferences - Held Abroad

<b>Date</b>	<b>Name of Conference</b>	<b>Place of Conference</b>	<b>Subject of Lecture/Discussion</b>	<b>Role</b>
July 2006	60th Annual Meeting, Phycological Society of America (PSA)	Juneau, Alaska, USA	The relationships between delayed and prompt fluorescence in monitoring photosynthetic traits of phytoplankton.	Poster
April 2010	The Water Research Conference	Lisbon, Portugal	Phenol utilization rate of root-attached, gravel-attached, and planktonic <i>Pseudomonas pseudoalcaligenes</i> isolated from a constructed wetland system.	Poster
September 2016	Bioreactor performance of the European Society on Biochemical Engineering Science	Bol, Croatia	Microbial culture encapsulation for phenols biodegradation.	Lecturer
September 2016	Working group on bioreactor performance of the European Society on Biochemical Engineering Science,	Bol, Croatia	The potential of culture encapsulation in a 3D microfiltration membrane capsules (SBP) for biodegradation.	Lecturer
October 2017	S2small (International IWA Conference on Sustainable Solutions for Small Water and Wastewater Treatment Systems),	Nantes, France	Phenol biodegradation by bacterial cultures encapsulated in 3D microfiltration-membrane capsules for industrial wastewater treatment.	Lecturer

## a2. International Conferences - Held in Israel

Date	Name of Conference	Place of Conference	Subject of Lecture/Discussion	Role
2006 May	Kinneret researches conference	Emek Hayarden, Israel	The Delayed fluorescence and the prompt fluorescence in Phytoplankton and the relationships between them	Lecturer
May 2006	The Third Annual Meeting of the Israeli Association for Aquatic Studies	Haifa University, Israel	The relationships between delayed and prompt fluorescence in monitoring photosynthetic traits of phytoplankton.	Lecturer
November 2008	The 15th Workshop of the International Association of Phytoplankton Taxonomy and Ecology (IAP)	Ramat, Israel	The relationships between delayed and prompt fluorescence in monitoring photosynthetic traits of phytoplankton.	Lecturer
March 2009	Annual Meeting of the Israel Society for Microbiology (ISM)	Bar Ilan University, Israel	A halotolerant <i>Streptomyces</i> sp., isolated from rhizosphere of a constructed wetland, biodegrades agar, agarose, chitin, polypectate, gellan gum, and phenol.	Poster
May 2009	37 <sup>th</sup> Annual Meeting of the Israeli Society of Ecology and Environmental Sciences	Weizmann Institute of Science, Israel:	A halotolerant <i>Streptomyces</i> sp., isolated from rhizosphere of a constructed wetland, biodegrades agar, agarose, chitin, polypectate, gellan gum, and phenol.	Poster
February 2010;	Annual Meeting of the Israel Society for Microbiology (ISM),	Bar Ilan University, Israel:	The fate of phenol in a constructed wetland mesocosm: microbiology, abiotic and plant uptake processes.	Poster
March 2010	Annual Meeting of the Israeli Water Association,	Kfar Maccabiah, Israel	The specific contribution of plants, microbial activity, and porous bed to phenol removal in constructed wetlands.	Lecturer
June 2010	38 <sup>th</sup> Annual Meeting of the Israeli Society of Ecology and Environmental Sciences	Ben-Gurion University, Israel	What is the environmental fate of phenol in constructed wetland systems and where do most bacteria present: on the plant roots, on the gravel or in the water (planktonic)?	Poster
June 2012	The 9th Annual Meeting of the Israeli Association for Aquatic Sciences	Kinneret Academic College Israel	Fluorescence and primary productivity.	Poster
October 2012	12th BMBF-MOST Seminar	Haifa, Israel	Development and implementation of a novel delayed- fluorescence based in situ profiler for primary production in aquatic systems.	Lecturer
November 2012	Kinneret researches	ILOR, Haifa, Israel	The use of delayed- fluorescence as a monitoring tool for	Lecturer

	conference,		phytoplankton activity in aquatic systems.	
April 2014	Annual Meeting of the Israel Society for Microbiology (ISM)	Haifa, Israel	Small-bioreactor platform technology in the wastewater treatment process.	Poster
April 2014;	Annual Meeting of the Israel Society for Microbiology (ISM)	Haifa, Israel	Small bioreactor platform (SBP) technology postulate new opportunities for research and industry.	Poster
April 2014	Annual Meeting of the Israeli water association	Kfar Maccabiah, Israel	Small-Bioreactor Platform Technology as a Municipal Wastewater Additive Treatment.	Poster
February 2015	Annual Meeting of the Israel Society for Microbiology (ISM),	Bar Ilan University, Israel	The potential of autochthonous microbial culture encapsulation in a confine environment for phenols biodegradation.	Poster
February 2016	Annual Meeting of the Israel Society for Microbiology (ISM),	Bar Ilan University, Israel	Performance comparison of plant root biofilm, gravel attached biofilm and planktonic microbial populations, in phenol removal within a constructed wetland wastewater treatment system.	Poster
February 2016	The 21st International Symposium Aquaculture In Israel	Nir Atzion, Israel	Phosphorus removal from fish pond water.	Lecturer
March 2016	The 21st Israel Association of Water Resources conference (E.Y.A.L)	Haspin, Israel	Phosphorus removal from dairy, fish pond and effluents using adsorption for sustainable agriculture.	Lecturer
May 2016	Aquaculture research meeting	Ministry of Agriculture and Rural Development, Israel	Phosphorus removal from fish pond water for sustainable aquaculture.	Lecturer
Oct 2016	Multidisciplinary scientific conference: Agriculture and Environment in the Golan Heights and Mount Hermon - innovations in research	Ohalo Academic College, Israel	Phosphorus removal from dairy, fish pond and effluents in the Golan using adsorption and sedimentation.	Lecturer
February 2017	Day of fishery research lectures	Fishery Department, The Ministry of Agriculture, Gilboa, Israel	Phosphorus removal from fish pond water.	Lecturer
March 2017	Annual Meeting of the Israel Society for Microbiology (ISM)	Vulcani center, Israel	Encapsulated <i>Pseudomonas putida</i> for phenol biodegradation: Use of a structural membrane for construction of a well-organized confined particle.	Poster
March	Annual Meeting of	Vulcani	Will an apple a day keep the	Poster

2017	the Israel Society for Microbiology (ISM)	center, Israel	doctor away, an affective biodegradation of morpholine.	
May 2017	The 22nd Israel Association of Water Resources conference (E.Y.A.L)	Aco, Israel	Phenol biodegradation by bacterial cultures encapsulated in 3D microfiltration-membrane capsules.	Poster

## 7. Invited Lectures (Others than in Scholarly Conferences)

### Abroad

None

### In Israel

Year	Name of Forum	Place of Lecture	Subject of Lecture	Role
May 2016	Aquaculture Challenges meeting	Ministry of Agriculture and Rural Development, Israel	Phosphorus removal from fish pond water for sustainable aquaculture.	Lecturer
Dec 2017	2nd workshop on micropollutants	Kinneret Academic College Israel	Estrogenic hormone (EE2) biodegradation	Lecturer

## 8. Colloquium Talks

NA

## 9. Research Grants

### a. Grants Awarded

Role in Research	Other Researchers (Name & Role)	Title	Funded by (C= Competitive Fund)	Amount	Years
PI	-	Water disinfection using electromagnetic field	Hydroflow, USA	20,000 NIS	2013
PI	Pinhas fine Co-PI	Phosphorus removal from wastewater	Katzir Keshet, Israel	40,000 NIS	2014
PI	Guy Rubinshtain Co-PI	Phosphorus removal from	C=Ministry of Agriculture and	2500 NIS	2014

		fish pond water	Rural Development, Israel		
PI	Guy Rubinshtain Co-PI	Phosphorus removal from fish pond water	C=Ministry of Agriculture and Rural Development, Israel	30,000 NIS	2015
Co-PI and coordinator	Ofir Menashe PI, Peleg Eistrhan Co-PI,	New technology for Hormones reduction from wastewaters	C=Ministry of Science, Technology and Space	Total 981,000 NIS (my part 275,000 NIS)	2015
PI	Guy Rubinshtain Co-PI, Oded Bar Shalom Co-PI	Phosphorus removal from fish pond water	C=Ministry of Agriculture and Rural Development, Israel	18000 NIS	2016
Co-PI	Pinhas Fine Co-PI, Oded Bar Shalom PI	Phosphorus removal from wastewater	C=Ministry of Science, Technology and Space	250,000 NIS	2016
PI	Ofir Menashe Co-PI, Robert Armon Co-PI	New Biofilter for Phosphorus and nitrogen removal in dairy wastewater	C=Ministry of Science, Technology and Space	250,000 NIS	2016
Co-PI	Pinhas Fine Co-PI, Oded Bar Shalom PI	Phosphorus removal from effluents using Phoslock	C=Ministry of Science, Technology and Space	250,000 NIS	2017

**b. Submission of Research Proposals – Pending**

<b>Role in Research</b>	<b>Other Researchers (Name &amp; Role)</b>	<b>Title</b>	<b>Funded by (C= Competitive Fund)</b>	<b>Years</b>
PI	Ofir Menashe Co-PI, Robert Armon Co-PI	Biofilter for dairy wastewater	C=Ministry of Science, Technology and Space	2017
PI	Robert Armon Co-PI	biosensor for food smart packages	C="KAMIN"	2017
PI	Robert Armon Co-PI Haiyan Hu Co-PI	Effluent Antibiotics and their effect on plants and soil bacteria	C=MOST-China	2017
PI		The role of plants and microbial community in phenolics decomposition	C=ISF	2017

### **c. Submission of Research Proposals – Not Funded**

<b>Role in Research</b>	<b>Other Researchers (Name &amp; Role)</b>	<b>Title</b>	<b>Funded by (C= Competitive Fund)</b>	<b>Years</b>
Co-PI	Robert Armon PI	A novel Algal microbial fuel cell	C=BMBF	2015
Co-IP	Ofir Menashe Co-PI, Hadas Maman PI Dror Avisar Co-PI	A novel Oxidative bioreactor for water treatment	c=Ministry of Science, Technology and Space, and MI"A	2016
PI	Ofir Menashe Co-PI, Robert Armon Co-PI	biofilter for N compounds removal from fish pond wastewater	c=Ministry of Science, Technology and Space	2016
Co-PI	Robert Armon PI	Biofilm prevention by a tannic acid-protein complex	C=ISF	2016
Co-PI	Robert Armon PI	Antibiotics effect on plants and bacteria in soil	C=ISF - china	2016
PI		Microbial Nitrogen removal from fish pond wastewater	C=GIF	2016

### **10. Scholarships, Awards and Prizes**

2005, 2006	"The Admiral Yohay Ben-Nun Foundation for Marine and Freshwater Sciences" competitive graduate student fellowship, Israel Oceanographic & Limnological Research (IOLR), Israel.
2006	Mana-Adesman Travel Award for active participation in an international conference (USA), Tel Aviv University, Israel.
2008	The Rieger Foundation-Jewish National Fund Program for Environmental Studies, California.
2008	Henrietta & Thelma Zackin award for excellent PhD students, The Grand Water Research Institute, Technion, Israel.
2009	The Rieger Foundation-Jewish National Fund Program for Environmental Studies, California.
2010	Israel Society for Microbiology (ISM) Travel Award for active participation in an international conference (Portugal).
2010	Outstanding presentation contest award, Israeli Water Association conference, Israel.
2013	Distinguished Lecturer, The Kinneret Academic College.



## **11. Teaching**

### **a. Courses Taught in Recent Years**

<b>Years</b>	<b>Name of Course</b>	<b>Type of Course</b> Lecture/Seminar/ Workshop/ Online Course/ Introduction Course (Mandatory)	<b>Level</b>	<b>Number of Students</b>
2017	"Environmental microbiology", Tel-Hai Academic College.	Lecture	BSc	25
2014-2017	"Ecotoxicology", Tel-Hai Academic College.	Lecture	BSc	25
2012-2014	"Water & Wastewater", Ohalo academic college	Lecture	BA	15
2012-2017	"Wastewater treatment and reuse" Ohalo & kinneret academic college	Lecture	Practical Engineering	35
2012-2017	"Drinking water treatment and quality", Ohalo & kinneret academic colleges	Lecture	Practical Engineering	35
2012-2013	"Biostatistics", Ohalo academic college	Lecture	BA	20
2011-2014	"Microbiology (laboratory)", The Kinneret Academic College.	Workshop-Lecture	BSc	28
2011-2014	"Water chemistry/water quality", Ohalo & kinneret academic colleges	Lecture	Practical Engineering	35

### **b. Supervision of Graduate Students**

<b>Name of Student /</b>	<b>Name of Other Mentors</b>	<b>Title of Thesis</b>	<b>Degree</b>	<b>Year of Completion/ In Progress</b>	<b>Students' Achievements</b>
<b>M.A. Students</b>					
Yaara Bar Oz	Prof. Hadas Maman	Remediation of olive mill waste water: a combined	Msc	In Progress, To be finish during 2018	Soon we will submit two papers

		process of physico-chemical and encapsulated biomass			
<b>Ph.D. Students</b>					
<b>None</b>					
<b>Post Doctorate Students</b>					
Rupak Kumar		Extracellular laccase production and phenolic compounds degradation by an olive oil mill wastewater isolate	PhD	2017	one paper (D19), another one in preparation

## 12. Miscellaneous

### **Under graduate research students:**

- 2014 Tolik Kulikov B. Sc. project student, Tel Hai College, "Phenol biodegradation using SBP technology".
- 2014 Ben Hakimi B. Sc. project student, Environmental Studies, Tel Hai College. "Batch bioreactor best performance for phenol biodegradation.
- 2015 Avner Katz , Water technologies Handesai, Kinneret technological College, "bacterial encapsulation".
- 2015 Amir Atzmon, Water technologies Handesai, Kinneret technological College, "bacterial encapsulation".
- 2015 Gal Shushan, Water technologies Handesai, Kinneret technological College, "Phosphorus removal from fish pond water".
- 2015 Roi Rot, Water technologies Handesai, Kinneret technological College, "Phosphorus removal from fish pond water ".

### **Public service activities**

- 2013-2014 Student project supervisor, High school "Beit Yerach", Emek Hayarden.
- 2014-2015 Student project supervisor, Yeshivat Haspin, Golan Hights.
- 2015 Professional advisor for the Excellency program in science for teenagers, Kinneret College.

## **Participation in international workshops**

2006: Workshop on Algae and the Broader Impacts of Science, 60th Annual Meeting, Phycological Society of America (PSA), Juneau, Alaska, USA.

2008: Workshop on Phytoplankton in the physical environment, The 15th Workshop of the International Association of Phytoplankton Taxonomy and Ecology (IAP), Ramot, Israel.

2012: Workshop on Phytoplankton fluorescence monitoring tools, The Leibniz Institute of Freshwater Ecology and Inland Fisheries, Neuglobsow, Germany.

2016: Working group on bioreactor performance of the European Society on Biochemical Engineering Science, Bol, Croatia.

2017: Nitrogen-transformations: Applications and Challenges, Nazareth, Israel.

## **Professional Certifications:**

1. Management of Hazardous Substances, Center for Hazardous Substances, Ministry of the Environmental protection, 2003.
2. Bioprocess Engineering Course, European Society of Biochemical Engineering Sciences (ESBES), Brac, Croatia, 2016.

## **PUBLICATIONS**

### **A. Ph.D. Dissertation**

**Title:** Specific contribution and interactions of bacteria, gravel bed and plants, in the process of phenols removal from wastewater using constructed wetland systems

**Date of submission:** 1.2011

**Number of Pages:** 185

**Language:** Hebrew

**Name of Supervisor:** Prof. Robert Armon

**University:** Technion-Israel Institute of Technology

**Publications:**D3, D4, D5, D6, D7, D8, D9

### **B. Scientific Books (Refereed)**

None

### **C. Monographs**

None

## **D. Articles in Refereed Journals**

### **Published**

1. **Kurzbaum E.**, W. Eckert, Y.Z. Yacobi (2007) Delayed fluorescence as a direct indicator of diurnal variation in quantum and radiant energy utilization efficiencies of phytoplankton. *Photosynthetica*, 45(4), 562-567.
2. **Kurzbaum E.**, S. Beer, W. Eckert (2010) Alterations in delayed and direct phytoplankton fluorescence in response to the diurnal light cycle. *Hydrobiologia*, 639(1), 197-203.
3. **Kurzbaum E.**, Kirzhner F., Sela S., Armon R. (2010) Efficiency of phenol biodegradation by planktonic *Pseudomonas pseudoalcaligenes* (a constructed wetland isolate) vs. root and gravel biofilm. *Water Research*, 44(17), 5021-31.
4. Gino E., Starosvetsky J., **Kurzbaum E.**, Armon R. (2010) Combined chemical-biological treatment for prevention/rehabilitation of clogged wells by an iron-oxidizing bacterium. *Environmental Science and Technology*, 44(8), 3123–3129
5. **Kurzbaum E.**, Kirzhner F. and R. Armon (2010) A simple method for dehydrogenase activity visualization of intact plant roots grown in soilless culture using tetrazolium violet. *Plant Root*, 4, 12-16.
6. **Kurzbaum E.**, Y. Zimmels, F. Kirzhner and R. Armon (2010) Removal of phenol in a constructed wetland system and the relative contribution of plant roots, microbial activity and porous bed. *Water Science and technology*, 62(6), 1327-34.
7. **Kurzbaum E.**, R. Armon, Y. Zimmels (2010) Isolation of a halotolerant *Streptomyces* sp. from a constructed wetland that biodegrade phenol and various biopolymers. *Actinomycetologica*, 24(2), 31–38.
8. **Kurzbaum E.**, F. Kirzhner, R. Armon (2012) Improvement of water quality using constructed wetland systems. *Reviews on Environmental Health* 27(1), 59–64.
9. **Kurzbaum E.**, F. Kirzhner, R. Armon. (2013) A hydroponic system for growing gnotobiotic vs. sterile plants to study phytoremediation processes. *International Journal of Phytoremediation*, 16(3) 267-274.
10. Menashe O., **Kurzbaum E.** (2014) Small-Bioreactor Platform Technology as a Municipal Wastewater Additive Treatment. *Water Science and Technology*, 69(3) 504-510.
11. Azaizeh H., **Kurzbaum E.**, Said H., Jaradat O. and Menashe O. (2015) The potential of autochthonous microbial culture encapsulation in a confined environment for phenols biodegradation. *Environmental Science and Pollution Research*, 22(19), 15179-15187.
12. Menashe O., **Kurzbaum E.** (2016) A Novel Bioaugmentation Treatment Approach using a Confined Microbial Environment: A Case Study in a MBR Wastewater Treatment Plant. *Environmental Technology* 37(12):1582-90.

13. **Kurzbaum E.**, F. Kirzhner, R. Armon (2016) Performance comparison of plant root biofilm, gravel attached biofilm and planktonic microbial populations, in phenol removal within a constructed wetland wastewater treatment system. *Water SA*, 42 (1), 166-170.
14. **Kurzbaum, E.**, Bar Shalom, O. (2016) The potential of phosphate removal from dairy wastewater and municipal wastewater effluents using a lanthanum-modified bentonite. *Applied Clay Science*, 123, 182-186.
15. Armon R., Gold D., Zuckerman U., **Kurzbaum E.** (2016) Environmental Aspects of *Cryptosporidium*. *Journal of Veterinary Medicine and Research* 3(2), 1048.
16. **Kurzbaum, E.**, Aharoni, A., Kirzhner, F., Azov, Y. and Armon, R. (2017) Aspects of carbon dioxide mitigation in a closed microalgae photo-bioreactor supplied with flue gas, *International Journal of Environment and Pollution*, Vol. 62, No. 1, pp.1–16.
17. **Kurzbaum E.**, Raizner Y., Cohen O., Rubinstein G., Bar Shalom O. (2017) Lanthanum-modified bentonite: Potential for efficient removal of phosphates from fish pond effluents. *Environmental Science and Pollution Research* 24(17), 15182-15186.
18. **Kurzbaum E.**, Raizner Y., Cohen O., Suckeveriene R.Y., Kulikov A., Hakimi B., Iasur Kruh L., Farber Y., Armon R., Menashe O. (2017) Encapsulated *Pseudomonas putida* for phenol biodegradation: Use of a structural membrane for construction of a well-organized confined particle. *Water research*, 121, 37–45.
19. Vardanian A., **Kurzbaum E.**, Farber Y., Butnariu M., Armon R. (2017) Facilitated enumeration of the silicate bacterium *Paenibacillus mucilaginosus* comb. nov. (formerly *Bacillus mucilaginosus*) via tetrazolium chloride incorporation into a double agar-based solid growth medium. *Folia Microbiologica* doi: 10.1007/s12223-017-0567-y. [Epub ahead of print].

#### **Accepted for Publication**

20. Rupak Kumar#, Yasmin Raizner, Lilach Iasur Kruh, Ofir Menashe, Hassan Azaizehe, Suman Kapur, **Eyal Kurzbaum**. Extracellular laccase production and phenolics degradation by an olive mill wastewater isolate. *Grasas y Aceites* (accepted 10.2017).

#### **E. Articles or Chapters in Scientific Books (Refereed)**

##### **Published**

1. Kurzbaum E. (2009): Delayed fluorescence spectroscopy as a simple and rapid measurement tool for active chlorophyll concentrations, phytoplankton compositions and a possible tool for monitoring photosynthetic traits of phytoplankton. In: *Marine Phytoplankton*, (William T. Kersey and Samuel P. Munger Eds.), Nova Science Publishers Inc., Hauppauge, NY, USA

Accepted for Publication

None

**F. Articles in Conference Proceedings**

**Published**

1. **Kurzbaum E.**, S. Beer, W. Eckert (2006) The relationships between delayed and prompt fluorescence in monitoring photosynthetic traits of phytoplankton. Phycological Society of America (PSA) Abs., Journal of Phycology, 42(1), 28-29.
2. **Kurzbaum E.**, R. Armon, Y. Zimmels (2009) Proceedings of the Thirty-Seventh Meeting of the Israel Society of Ecology and Environmental Science (Isees) at The Davidson Institute of Scientific Education Weizmann Institute of Science 12-13 MAY 2009, Israel Journal of Ecology and Evolution, 55(3), 2009, 281 – 304.
3. Werner Eckert, Franziska Leunert, **Eyal Kurzbaum**, Yossef Yacobi, Volkmar Gerhard, Jan Köhler (2017) In situ delayed fluorescence decay kinetics as a proxy for phytoplankton productivity in Lake Kinneret. AQUAFLUO (AQUATIC FLUORESCENCE) (2), 2017.

**G. Entries in Encyclopedias**

None

**H. Other Scientific Publications**

**Published**

**Research reports:**

1. **Kurzbaum E.**, W. Eckert, S. Beer (2006) The relationships between Prompt and Delayed fluorescence in phytoplankton. Israel Oceanographic and Limnological Research report T5/2006, 106-111.
2. Eckert W., **Kurzbaum E.**, Yacobi Y.Z., Köhler Y. (2012) Development and implementation of a novel delayed- fluorescence based in situ profiler for primary productivity in aquatic systems. Israel Oceanographic and Limnological Research report T15/2012, 123-127.
3. Eckert W., Y.Z. Yacobi, **E. Kurzbaum**, J. Köhler, F. Leunert (2014) Development and implementation of a novel delayed- fluorescence based *in situ* profiler for primary productivity in aquatic systems. Final Report to the Joint German-Israeli Research Program (BMBF-MOST), T6/2014 Project Number WT 1003/2264.
4. Eckert W., **E. Kurzbaum**, Y.Z. Yacobi, J. Köhler, F. Leunert (2014) Development and implementation of a novel instrument for primary productivity measurement. Israel Oceanographic and Limnological Research report T11/2014, 142-145.
5. **Kurzbaum E.**, Bar Shalom O., fine P. (2014). Phosphate removal from dairy wastewater. Final report – Katzir- Keshet. 20 pages (In Hebrew).
6. **Kurzbaum E.** (2016) Phosphorus removal from fish pond water for sustainable aquaculture. Ministry of Agriculture and Rural Development, Israel.
7. **Kurzbaum E.** G. Rubinshtain, O. Bar Shalom (2017) Phosphorus removal from aquaculture wastewater. Ministry of Agriculture and Rural Development, Israel.

## **Accepted for Publication**

None

## **I. Other Works and Publications**

1. **Kurzbaum E.**, Bar Shalom O. (2016). Phosphate removal from dairy wastewater. *Eretz ha Kinneret*, 16, 30-31 (in Hebrew).
2. **Kurzbaum E.** (2015) Bioluminescence in the nature. MAKO website, published on 9.4.15 (in Hebrew).
3. **Kurzbaum E.**, Yacobi Y.Z., Eckert W. (2014) A novel in situ profiler for phytoplankton photosynthesis measurement. *Eretz ha Kinneret*, 14, 30-33 (in Hebrew).
4. **Kurzbaum E.**, Yacobi Y.Z., Eckert W. (2013) Development of a novel delayed-fluorescence based in situ profiler for phytoplankton activity measurement. *Kinneret News* (Rimer A. Ed.), 34. (in Hebrew).
5. **Kurzbaum E.**, S. Beer, W. Eckert (2005) The Delayed fluorescence and the prompt fluorescence in Phytoplankton and their relationships. *Kinneret News* (Rimer A. Ed.),28,7-13. (in Hebrew).

## **J. Submitted Publications**

None

## **K. Summary of my Activities and Future Plans**

MSc in ecology and environmental studies and a PhD in environmental microbiology in the wastewater treatment field, with 14 years of experience in environmental research. My research focuses on the study, development and optimization, of processes of water treatment for different kind of influents (domestic and industrial) and other issues in environmental microbiology such as microalgae ecology and water disinfection. Using laboratory and field pilot scale systems dedicated to wastewater treatment, research has been devoted to improve performances (removal of organics, phosphorus and nitrogen) intensify systems (compactness) and develop associations of conventional systems with treatment wetlands.

In the last 6 years, my research interest focuses on environmental microbiology and water treatment. My current research was and is still focused mainly on bioaugmentation treatment approaches using encapsulated microorganisms for water treatment. The bioaugmentation treatment approach (addition of cultured microorganism required to speed up the rate of degradation of a contaminant) presents both an economical and environmental friendly solution for wastewater treatment. However, the use of exogenous bacterial culture presents several limitations: negative interaction between microorganisms, and adaptation to new physical and chemical composite environment and dilution due to continuous incoming water. These selective forces create a significant challenge for the new introduced culture to achieve the required biomass in order to conduct the target biological treatment. Among the ongoing research projects is an investigation of a new technology together with an Israeli start-up company (Biocastle) called the "SBP technology" which is based on a specially designed capsule which physically separates introduced microbial culture inside the capsule from the outer natural microbial flora of wastewater. The main aim of this study is to increase the wastewater microorganisms' diversity, in order to achieve removal of specific contaminants and to increase the stability of the biological process within the wastewater

treatment process, by developing an additional microbial biomass and path to the bioreactor microbial flora.

Among the ongoing research projects I am currently studying the following issues:

- i. The uses of bioaugmentation approaches for enhance biodegradation rates of phenolic compounds (which are toxic for most bacteria) in olive mill wastewater. The aim is to reduce the toxicity of the phenolic compounds in order to use the organic matter of the olive mill wastewater for biogas production. This is done using the SBP technology and suspended bacterial isolates (identified by molecular tools) isolated from an olive mill wastewater treatment bioreactor.
- ii. Many studies have demonstrated that endocrine disrupting compounds (EDCs) are able to mimic hormones or interfere with the action of endogenous hormones. Due to their high bioactivity, ubiquitous nature, toxicity and persistence, it is of extreme importance to develop novel approaches to eliminate these compounds from the environment. We are currently starting to investigate whether the SBP technology can accelerate the biodegradation of hormones within treated wastewater, using this unique bioaugmentation technology.
- iii. I also collaborate with researchers from other fields (such as chemical and physical treatments) to combine the biological approach with physico-chemical treatment to accelerate the breakdown of micropollutants and industrial organic pollutants.

I am also interested in phytoplankton activity assessment using fluorescence methods. The diagnostics of the ecological condition of water bodies is a global challenge. Phytoplankton forms the base of aquatic ecosystems and its activity determines their state and primary productivity (PP). Concentration and photosynthetic activity of algal cells are characteristics of aqueous systems that are primarily affected by various environmental factors and anthropogenic pollution. Hence, monitoring of these characteristics can be used to assess the state of an aqueous system as the whole. Presently, parameters of chlorophyll fluorescence are widely used to assess the abundance and activity of phytoplankton. Methods for fluorescence registration are highly sensitive and allow fluorescence measurement to be conducted in the natural habitat of algae, without affecting their physiological state.

Delayed Fluorescence (DF) is a so called recombination fluorescence that can be measured when photosynthetically active cells are transferred from light to dark due to the backflow of electrons through the electron-transport-chain to Photosystem II. Based on findings that the DF intensity of algal cells follows closely photosynthetic activity parameters we developed the hypothesis that this parameter represents a quantitative proxy for PP. To gain a thorough understanding of this issues cooperation with experts from other fields is continuously taking place. Base on our hypothesis we focused on the following research interests:

- i. The development and implementation of a DF-based profiler for *in situ* assessment of PP in lakes.
- ii. An additional aim is to use DF for studying phytoplankton's photo-acclimation processes within the photosynthetic system of the algae cell. This is done using the comparisons of DF emission monitoring with photoprotective response of xanthophyll pigments (measured with HPLC) and with the quantum yield of photosystem II measured with Pulse-amplitude modulation (PAM) fluorometer.