

## CURRICULUM VITAE

**Luz-Estela Gonzalez de-Bashan**

(January 1, 2010)

### Addresses:

**E-mail:** luzb@cals.arizona.edu

**Personal webpage:** <http://www.bashanfoundation.org/gmaweb/personal/ilegonzal.htm>

### Professional preparation:

#### *Undergraduate institution*

Department of Biology,  
Pontificia Universidad Javeriana, Bogota, Colombia. Biology, B.Sc. 1990

#### *Graduate institutions*

Department of Biology,  
National University of Colombia, Bogota, Colombia Systematics of microalgae, M.Sc. 1995

Department of Soils and Food Engineering,  
Laval University, Quebec City, Quebec, Canada Microbiology, Ph.D. 2006

#### *Postdoctoral Institute*

Department of Water, Soil and Environmental Science  
The University of Arizona, Tucson, USA Phytoremediation, April 2007-Aug 2008

### Positions:

2003 – present. **Scientist-in-Residence**; Bashan foundation, Corvallis, Oregon, USA. **Main position.**

2000 – Present. **Research Scientist**, Environmental Microbiology Group, The Northwestern Center for Biological Research (a Federal Government Research Institute), La Paz, BCS, Mexico (*With tenure*), **Main position.**

2000 – Present. **Honoric Professor-Researcher**. Department of Biology, Faculty of Science, Pontificia Universidad Javeriana, Bogota Colombia.

1994-2000. **Assistant Professor-Researcher**. Department of Biology, Faculty of Science, Pontificia Universidad Javeriana, Bogota Colombia.

1995- 2000. **Coordinator** of the Program of Sanitation and Environmental Biotechnology. Faculty of Science, Pontificia Universidad Javeriana, Bogota Colombia.

1990-1994. **Freelance industrial environmental consultant** in Colombia.

## RESEARCH FIELDS:

### *Main field:*

1994-Present- **Microbiology and Biotechnology; Use of microalgae for bioremediation of water and eroded soils and production of alternative fuels.** (Details are in my application letter)

### *Secondary fields and research experience:*

2007 - Present. Stabilization of mine tailings  
 1996 - Present. Microbial inoculants  
 1997 - Present. Desert vegetation  
 1994 - Present. Microalgae Biotechnology  
 1994 - Present. Water bioassays  
 1990 - 1994. Biological evaluation of water  
 1990 - 1994. Environmental evaluation of hydric resources  
 1990 - 1994. Monitoring of contaminants in water

## Honors and awards:

1. 2008- 2010. Nominated as a sponsored, foreign member to the New York Academy of Sciences.
2. 2007 - Evaluator of the international award in Applied Microbiology "Elizabeth Grose" that was presented at the 6<sup>th</sup> Simposio Latinoamericano de Biodeterioro y Biodegradacion. Bogota, Colombia, April 30, 2007
3. 2006 - Ph.D. Graduation with High Distinction (Thesis defense evaluation, "A+", 97/100; average Ph.D. studies, "A+") at Laval University, Quebec, Canada.
4. 2005-2009. Ad-hoc reviewer for scientific peer-reviewed journals: 33 manuscripts (to November 15, 2009) for 17 journals. Editorial board member of one journal.
5. 2002-2013 (four times). Selected as member of the Sistema Nacional de Investigadores (SNI), Mexico (National Researcher level 1)
6. 2005 - National recognition of project. The Project "Bioremediation of wastewater" was recognized by the Ministry of Ecology of Mexico as exemplary, and was selected as a "success case" of applied research to be presented to the President of Mexico (5.8.2005).
7. 2005. Recognized by the "Sistema Nacional de Investigadores" (National Research System, SNI), Mexico as a scientist with high quality and high impact publications.
8. 2004 - A top download article. The paper on removing of phosphorus from wastewater (Water Research 38: 4222-4246) originated from the project "Bioremediation of wastewater" reached the first place in number of worldwide downloads in the "Top 25 articles" of the high impact journal "Water Research". (ScienceDirect.com; October-December, 2004)
9. 2001 – 2004. Received 3 merit scholarships (annually), as a foreign student, from the Provincial Government of Quebec, Canada to conduct Ph.D. studies.
10. 2000 - Received the title "Honorific Professor-Researcher", from the Department of Biology, Faculty of Science, Pontificia Universidad Javeriana, Bogota Colombia, allowing regular academic and research activities within the university from abroad without a salary.
11. 1999 - My Research group (two researchers, one technician and three students) was selected as Category "B" (from 6 possible categories) by the national evaluation of research groups of COLCIENCIAS, Colombia (National Science Foundation of Colombia), based on productivity and quality of the research.

## Fluency in languages:

English: 93% (TOFEL 623/670, 2000); Fluent (100%) (2008).

Spanish: 100%

Portuguese: 70%

French: 55%

Hebrew: Under study

## Grants: 687,000 US\$

1. 2008-2009 - "The National Science and Technology Council of Mexico" (CONACYT) **Project:** Molecular evaluation of the interaction and population dynamics between microalgae and microalgae growth-promoting bacteria in wastewater. (10,000 US\$) (**PI**).
2. 2007-2010 - "The National Science and Technology Council of Mexico" (CONACYT-Basic research program). **Project:** Cellular mechanisms controlling the combined growth of microalgae and microalgae growth-promoting bacteria and their contribution to eliminate nutrients (N and P) from wastewater. (131,000 US\$)(**co-PI** together with Dr. Yoav Bashan, CIBNOR, La Paz, Mexico)
3. 2007-2010 - "Ministry of the Environment and Natural Resources of Mexico" (SEMARNAT). **Project:** Scaling up of a new technology for tertiary wastewater treatment combined with restoration of eroded arid soils using co-immobilized bacteria and microalgae. (172,000 US\$)( **co-PI** together with Dr. Yoav Bashan and Dr. Esther Puente, CIBNOR, La Paz, Mexico)
4. 2007-2009 - "The National Science and Technology Council of Mexico" (CONACYT). **Project:** Phytostabilization of mine tailings in northwestern Mexico: The role of plant-soil-microbe interactions (74,000 US\$) (**co-PI** together with Dr. Esther Puente and Dr. Yoav Bashan, CIBNOR, La Paz, Mexico)
5. 2005-2008 - "National Forestry Commission, Mexico". **Project:** Growth promoting bacteria associated with arid-saline environment and their effect on reproduction on two species of mesquite trees". (53,000 US\$) (**co-PI** together with Dr. Edgar Rueda, University of Sonora, Santa Ana, Dr. Yoav Bashan and Dr. Esther Puente, CIBNOR, La Paz, Mexico)
6. 2003-2006 - "Ministry of the Environment and Natural Resources of Mexico" (SEMARNAT). Center for Biological Research of the Northwest (Mexico). **Project:** Design of new combined strategy for biological treatment of wastewater and restoration of eroded soils using microalgae growth-promoting bacteria (MGPB) and microalgae coimmobilized in polymers. (163,000 US\$). (**co-PI**, together with Dr. Yoav Bashan).
7. 1999-2000 - COLCIENCIAS (National Science Foundation of Colombia)-Pontificia Universidad Javeriana, Colombia. **Project:** Evaluation of a combined microalgae-macrophytes system for treating industrial wastewater. Second phase. (25,000) - **PI**.
8. 1997-1999 - COLCIENCIAS (National Science Foundation of Colombia)-Pontificia Universidad Javeriana, Colombia - Center for Biological Research of the Northwest (México). **Project:** Immobilization of bacteria and microalgae in alginate beads to remove inorganic nitrogen from agroindustrial wastewaters (12,000) - **PI**.
9. 1997-1999 - COLCIENCIAS (National Science Foundation of Colombia)-Pontificia Universidad Javeriana, Colombia. **Project:** Evaluation of a combined microalgae-macrophytes system for treating industrial wastewater. Phase I. (26,000) - **PI**.
10. 1994-1995 - COLCIENCIAS (National Science Foundation of Colombia)-Pontificia Universidad Javeriana, Colombia. **Project:** Evaluation of microalgae in bioreactors for tertiary treatment of agroindustrial wastewaters. (23,000) - **co-PI**.

## Teaching experience:

1. 2004 - Lecturer in the international course for graduate students and researchers on "Mechanisms of cleaning wastewater using natural and constructed wetlands". Presented by Luz E. de-Bashan and Yoav Bashan. Financed by RIPDA-CYTED network for Latin America (Mexico) and Department of Microbiology and Civil Engineering, Pontificia Universidad Javeriana, Bogota, Colombia. Presented at Pontificia Universidad Javeriana, Bogota, Colombia. (35 hours). October 25-29, 2004.
2. 2003 - Coordinator of the course, laboratory instructor and lecturer and in the course for graduate students and researchers on "Biotechnological use of beneficial microorganisms-theory and practice". Presented by 3 researchers and 4 technicians of the group of Environmental Microbiology of CIB at The Center for Biological Research of the Northwest, La Paz, Mexico (60 hours, including laboratory). October 5-16, 2003.
3. 2002 - Lecturer and laboratory instructor in the course for graduate students and researchers on "Environmental Biotechnology". Pontificia Universidad Javeriana, Bogota, Colombia. (60 hours, including laboratory). October 10-25, 2002.
4. 1999 - Lecturer in the First International course on Environmental Biotechnology. Department of Biological Sciences, Laboratory of Microbial Ecology and Food (LEMA). Universidad de los Andes. Bogotá. Colombia, April 12-16, 1999. 25 h.
5. 1998 - Lecturer in the Workshop "Basic tools in environmental microbiology". Course of the Advance Education unit. Pontificia Universidad Javeriana. Bogotá, Colombia, November 9-14, 1998. 20 h.
6. 1998 - Laboratory lecturer in the Workshop "Biotechnological applications in microbial ecology". Course of the Advance Education unit. Pontificia Universidad Javeriana. Bogotá, Colombia, October 5-16, 1998. 70 h.
7. 1997 - Lecturer in the Course "Wastewater treatment". Department of Graduate studies. Pontificia Universidad Javeriana, Bogotá, Colombia, 20 h.
8. 1996-2000 - Lecturer in the curriculum course "Aquatic Contamination". Department of Biology. Pontificia Universidad Javeriana, Bogotá, Colombia. Twice a year- presented 10 times. 50 h.
9. 1998-1999 - Lecturer in the curriculum course "Evolution Biology and Ecology". Department of Biology. Pontificia Universidad Javeriana, Bogotá, Colombia. Twice a year- presented 4 times. 65 h.
10. 1995 - Lecturer in the curriculum course "Bioessays". Department of Biology. Pontificia Universidad Javeriana, Bogotá, Colombia. 50 h.

## Mentoring activities:

### (i) *Theses completed:* 9

1. Noga Bashan. 2009. **Diploma in Environmental Engineering**. Israel Institute of Technology (Technion), Haifa, Israel.
2. Yaneth Rodríguez. 2006-2007. **Diploma in Agricultural Engineering**. The National University of Colombia, Bogota, Colombia.
3. Adan Trejo. 2005-2006. **Diploma in Biotechnology**. Metropolitan Autonomous University (UAM), Xochimilco, Mexico City.
4. Silke Fendrich. 2004-2005. **Diploma in Environmental Engineering**. Technical University of Hamburg-Harburg, Hamburg, Germany (Main advisor with three co-advisors from Mexico and Germany).
5. Juan-Pablo Hernandez. 2003- 2005. **M.Sc.** National Polytechnic Institute, The center for interdisciplinary marine studies (CICMAR), La Paz, Mexico.
6. Juan Pablo Hernandez. 2001. **Diploma in Biology**. Pontificia Universidad Javeriana, Bogota, Colombia.
7. Claudia Milena Rodriguez. 1999. **Diploma in Biology**. Pontificia Universidad Javeriana, Bogota, Colombia.

8. Beatriz Eugenia Cerón. 1998. **Diploma in Biology**. Pontificia Universidad Javeriana, Bogota, Colombia.
9. Susana Karime 1998. **Diploma in Biology**. Pontificia Universidad Javeriana, Bogota, Colombia.

**(ii) Advising and training of undergraduate students and foreign visitors: 9**

1. Biol. Juan Cortes. 2009. Algoil S.A. Nicaragua.
2. Professor Jimena Sanchez. 2006. National University of Colombia, Bogota, Colombia.
3. cDr. Mei Li. 2005. Tropical Forestry Research Institute, Goangzhou, P.R. China.
4. cBiochem. Eng. Delia de la Toba. 2005. Technical Institute of La Paz, La Paz, Mexico.
5. Biol. Marcela Casillas. 2004. National School of Biological Sciences, National Polytechnique Institute, Mexico City, Mexico.
6. cBiol. Diana Arizmendi. 2004. Autonomous Metropolitan University, Mexico City, Mexico. (UAM)
7. cBiol. Elsa Samano. 2004. Technical institute of Sonora (ITSON), Cd. Obregon, Sonora, Mexico.
8. cBiol. Lina Gonzalez. 2003. Dept. of Biology, National University of Colombia, Bogota, Colombia.
9. Lic. Martha Garavito. 2003. Dept. of Industrial Microbiology. Pontificia Universidad Javeriana, Bogota, Colombia.

**Invited scholarly presentations: 23**

1. **de-Bashan, L.E.**, Bashan, Y. Salazar, B., Moreno, M., Hernández. J.P. 2009. Use of microbiol inoculant in recovery of eroded desert soils in Baja California Sur [Utilización de inoculantes microbianos en la recuperación de suelos desérticos erosionados en Baja California Sur]. In: **National meeting on microbiol germplasm as genetic resource for application in agriculture, food and the environment**. December 2-4, 2009, Mexico City, Mexico. (**Invited lecture**).
2. **de-Bashan, L.E.**, Bashan, Y. Hernández. J.-P., Trejo, A., Perez-Garcia, O. 2009. Immobilized algae for water treatment. **Bioencapsulation Industrial Symposium**. November 26-27, 2009, Puerto Varas, Chile. (**Invited lecture**).
3. **de-Bashan, L.E.**, Bashan, Y. 2009. Plant growth promoting bacteria: isolation and application as inoculants [Bacterias promotoras de crecimiento vegetal: aislamiento y su aplicación como inoculantes]. In: **Special seminar**, Facultad de Ciencias Agrarias, Universidad Austral de Chile. November 24, 2009, Valdivia, Chile. (**Invited lecture**).
4. **de-Bashan, L.E.**, Trejo, A., and Bashan, Y. 2009. (i) Interaction between *Chlorella vulgaris* and *Azospirillum brasilense* jointly immobilized in alginate beads, and (ii) Use of leftover beads coming from the wastewater treatment as microbial inoculant. In: **Special seminar**, Department of Plant-Microbe Interactions, Helmholtz Centre, German Research Centre for Environmental Health. September 4, 2009, Munich, Germany (**Invited lecture**).
5. **de-Bashan, L.E.** and Bashan, Y. 2009. Plant growth-promoting bacteria and green microalgae: a convenient model for basic studies of plant-bacterium interactions. In: **Special departmental seminar** of the Department of Plant-Microbe Interactions, Helmholtz Centre, German Research Centre for Environmental Health. July 13, 2009, Munich, Germany (**Invited lecture**).
6. **de-Bashan, L.E.** 2009. Use of plant growth promoting bacteria for environmental purposes. **Special seminar** at Lincoln University, May 11, 2009. Jefferson City, Missouri, USA (**Invited lecture**).
7. **de-Bashan, L.E.** 2009. Phytostabilization of arid mine tailings using native plants inoculated with plant growth-promoting bacteria. **Special group seminar** in: Group of Food Biochemistry, Northwestern Center for Biological Research, April 21, 2009. La Paz, Mexico. (**Invited lecture**).
8. **de-Bashan, L.E.**, and Bashan, Y. 2008. Microalgae-plant growth-promoting bacteria as experimental model for basic and applied studies of plant-bacteria interactions, with emphasis on wastewater treatment. **Seminar in Soils and Crops Research and Development**. Centre of Agriculture and Agri-Food Canada, October 24, 2008. Quebec City, Quebec, Canada (**invited lecture**).

9. **de-Bashan, L.E.** 2008. Use of plant growth-promoting bacteria for recovering of eroded soils and phytostabilization of mine tailings. **Departmental Seminar**. Department of soil science and agriculture engineering, Faculty of agriculture and food sciences, Laval University. October 24, 2008. Quebec City, Quebec, Canada **(Invited lecture)**.
10. **de-Bashan, L.E.**, Hernandez, J.-P., Trejo, A., Perez, O., and Bashan, Y. 2008. Growth-promoting bacteria as “helper” for green microalgae during tertiary wastewater treatment. In: **58<sup>th</sup> Canadian Chemical Engineering Conference**, October 19-22, 2008, Ottawa, Canada **(Invited lecture)**.
11. **de-Bashan, L.E.**, Hernandez, J.-P., and Bashan, Y. 2007. Microalga growth-promoting bacteria: a new venue for wastewater treatment and restoring eroded soils. 11th Argentinean Congress of Microbiology. 10–12.10. 2007. Cordoba, Argentina **(Invited lecture)**.
12. **de-Bashan L.E.**, Hernandez J.-P., and Bashan Y. 2007. *Azospirillum brasilense* as an enhancer of wastewater treatment with the microalgae *Chlorella* spp., a novel biotechnological application. In: *Azospirillum* VII and related PGPR International workshop. August 31- September 1, 2007. Montpellier, France **(invited lecture)**. p. 10.
13. **de-Bashan, L.E.** 2007. Use of plant growth-promoting bacteria on plants for recovering eroded desert soils. Special conference in: Faculty of Agronomy, National University of Colombia, March 15, 2007. Bogotá, Colombia. **(Invited lecture)**
14. **de-Bashan, L.E.** 2007. Ammonium metabolism coupled with indole acetic acid in the microalgae *Chlorella vulgaris* when co-immobilized with the microalgae-growth promoting bacterium *Azospirillum brasilense*. In: Special conference in Department of Biology, Faculty of Science, National University of Colombia, March 14, 2007. Bogota, Colombia **(Invited lecture)**.
15. **de-Bashan, L.E.** 2006. Immobilization of microalgae for nutrient removal from wastewater. In: The microalgae forum - cycle of conferences. CIBNOR, April 28, 2006, La Paz, Mexico **(Invited lecture)**.
16. **de-Bashan, L.E.** 2005. Phycoremediation: the use of microalgae and bacteria for wastewater treatment.. In: Special conference in Department of Biology, Facultad de Ciencias, Universidad Nacional de Colombia, November 2, 2005. Bogota, Colombia **(Invited lecture)**.
17. **de-Bashan, L.E.** 2004. Biorremediacion de aguas utilizando microorganismos beneficios. In: Special conference on the use of beneficial microorganisms, Escuela de Geociencias, Facultad de Ciencias, Universidad Nacional de Colombia, November 1-2, 2004. Medellin, Colombia **(Key-note lecture)**.
18. **de-Bashan, L.E.** 2004. Immobilization of microorganisms for environmental purposes. Jornada académico-culturales 2004. Unidad regional norte, campus Santa Ana, División de ciencias administrativas, contables y agropecuarias. University of Sonora, October 11-15, 2004. Santa Ana, Sonora, Mexico **(Key-note lecture)**.
19. **de-Bashan, L.E.**, Hernandez, J.-P. and Bashan, Y. 2002. Co-immobilization in alginate beads of microalgae with microalgae growth-promoting bacterium as a novel approach for removing ammonium and phosphorus ions from wastewater. First International Meeting on Microbial Phosphate Solubilization. Salamanca, Spain, July 16-19, 2002, p. 73 **(Invited lecture)**.
20. **González L.E.** 1999. Removal of nitrates and phosphorus from wastewater using microalgae. Second International Conference on Environmental Microbiology. Pontificia Universidad Javeriana. May 19-21, 1999. Bogotá, Colombia **(Invited lecture)**.
21. **Gonzalez, L.E.** 1999. Use of microalgae for wastewater treatment. First Colombian Conference on Botany. Continental phycology in Colombia, Perspectives and Development. April 26-30, 1999. Bogotá, Colombia **(Invited lecture)**.
22. **González, L.E.**, R. Vazquez-Juarez and Bashan, Y. 1998. Immobilization of bacteria and microalgae in alginate to remove inorganic nitrogen from agroindustrial wastewaters. Second Colombian Simposium on Environmental Biotechnology. University of Boyacá, Research Center for Development “CIPADE”. May 20-22, 1998. Tunja, Colombia **(Invited lecture)**.
23. **Gonzalez, L.E.** and Valderrama, L.T. 1997. Utilization of microalgae for the tertiary treatment of agroindustrial wastewater. First Conference on Environmental Microbiology. Pontificia Universidad Javeriana. February 19-21, 1997. Bogotá, Colombia. **(Invited lecture)**.

**Administrative experience:**

1. 2003 – present. **Vice-President**. “The Bashan Foundation-for the advancement of science and arts”- Oregon, USA. A virtual international scientific research institute supporting diffusion of scientific information, graduate students from developing countries, environmental studies and arts. ([www.bashanfoundation.org](http://www.bashanfoundation.org))
2. 2000- 2007. **Coordinator, technical, and administrative responsible** for the Environmental Microbiology Group’s facility (3 research laboratories), The Northwestern Center for Biological Research (CIBNOR), La Paz, Mexico.
3. 1995-2000. **Coordinator** of the Program of Sanitation and Environmental Biotechnology. Faculty of Sciences, Department of Biology, Pontificia Universidad Javeriana, Bogota, Colombia.

**Cooperation with commercial companies: 1**

1. 2009. “**Algoil, S.A**”, Nicaragua. **Project**: Massive propagation of *Chlorella*.

**PUBLICATIONS:**

**(Note:** Until 2000 listed as: Gonzalez, L.E.; In 2000-2001 listed as: Gonzalez-Bashan, L.E.; from 2002 listed as: de-Bashan, L.E.)

**Peer-reviewed journal articles: 28**

**(In parentheses the impact factor (Journal Citation Reports®, Thomson Reuters at the time of publication).**

**Publications denoted with \* are from my Ph.D. thesis**

**Publications denoted with \*\* are from my postdoctoral period**

1. **Gonzalez, L.E.**, R.O. Cañizares and S. Baena. 1997. Efficiency of ammonia and phosphorus removal from a Colombian agroindustrial wastewater by the microalgae *Chlorella vulgaris* and *Scenedesmus dimorphus*. **Bioresource Technology** **60**: 259-262. (0.417)
2. Bashan, Y. and **L.E. Gonzalez**. 1999. Long-term survival of the plant growth-promoting bacteria *Azospirillum brasilense* and *Pseudomonas fluorescens* in dry alginate inoculant. **Applied Microbiology and Biotechnology** **51**: 262-266 (1.641)
3. **Gonzalez, L.E.** and Y. Bashan. 2000. Growth promotion of the microalgae *Chlorella vulgaris* when coimmobilized and cocultured in alginate beads with the plant growth-promoting bacteria *Azospirillum brasilense*. **Applied and Environmental Microbiology** **66**: 1537-1541 (3.389)
4. Bashan, Y., **Gonzalez, L.E.**, Toledo, G., Leon de La Luz, J.L., Bethlenfalvay, G., Carrillo, A., Troyo, E., Rojas, A., Holguin, G., Puente, M.E., Lebsky, V.K., Vazquez, P., Castellanos, T. and Glazier, E. 2000. A need for conservation of exceptional stands of the giant cardon cactus (*Pachycereus pringlei*) in Baja California Sur, Mexico. **Natural Areas Journal** **20**: 197-200 (0.452).
5. **Gonzalez-Bashan, L.E.**, V. Lebsky, J. P. Hernandez, J.J. Bustillos and Bashan, Y. 2000. Changes in the metabolism of the microalgae *Chlorella vulgaris* when coimmobilized in alginate with the nitrogen-fixing *Phyllobacterium myrsinacearum*. **Canadian Journal of Microbiology** **46**: 653-659 (1.105).
6. Lebsky, V.K., **Gonzalez-Bashan, L.E.**, and Bashan, Y. 2001. Ultrastructure of coimmobilization of the microalga *Chlorella vulgaris* with the plant growth-promoting bacterium *Azospirillum brasilense* and with its natural associative bacterium *Phyllobacterium myrsinacearum* in alginate beads. **Canadian Journal of Microbiology** **47**: 1-8 (1.071)
7. **de-Bashan, L.E.**, Moreno, M. Hernandez, J.-P., and Bashan, Y. 2002. Removal of ammonium and phosphorus ions from synthetic wastewater by the microalgae *Chlorella vulgaris* coimmobilized in alginate beads with the microalga growth-promoting bacterium *Azospirillum brasilense*. **Water Research** **36**: 2941-2948 (1.611)
8. Bashan, Y., Li, C.Y., Lebsky, V.K., Moreno, M., and **de-Bashan, L.E.** 2002. Primary colonization of volcanic rocks by plants in arid Baja California, Mexico. **Plant Biology** **4**: 392-402 (1.352)
9. Bashan, Y., and **de-Bashan, L.E.** 2002. Protection of tomato seedlings against infection by *Pseudomonas syringae* pv tomato by using the plant growth-promoting bacterium *Azospirillum brasilense*. **Applied and Environmental Microbiology** **68**: 2637-2643 (3.691)
10. Valderrama, L.T., Del Campo, C.M., Rodriguez, C.M., **de-Bashan, L.E.**, and Bashan, Y. 2002. Treatment of recalcitrant wastewater from ethanol and citric acid production using the microalga *Chlorella vulgaris* and the macrophyte *Lemna minuscule*. **Water Research** **36**: 4185 - 4192 (1.611)
11. **de-Bashan, L.E.**, Bashan, Y., Moreno, M., Lebsky, V.K., and Bustillos, J.J. 2002. Increased pigment and lipid content, lipid variety, and cell and population size of the microalgae *Chlorella* spp. when co-immobilized in alginate beads with the microalgae-growth-promoting bacterium *Azospirillum brasilenses*. **Canadian Journal of Microbiology** **48**: 514-521 (1.08)

12. Bashan, Y. and **de-Bashan, L.E.** 2002. Reduction of bacterial speck (*Pseudomonas syringae* pv *tomato*) of tomato by combined treatments of plant growth-promoting bacterium, *Azospirillum brasilense*, streptomycin sulfate, and chemo-thermal seed treatment. **European Journal of Plant Pathology** **108**: 821-829 (1.475)
13. **de-Bashan L.E.**, Hernandez J.-P., Morey, T., and Bashan Y. 2004. Microalgae growth-promoting bacteria as “helpers” for microalgae: a novel approach for removing ammonium and phosphorus from municipal wastewater. **Water Research** **38**: 466-474 (2.304).
14. Bashan, Y., Holguin, G. and **de-Bashan, L.E.** 2004. *Azospirillum*-plant relationships: physiological, molecular, agricultural, and environmental advances (1997-2003). **Canadian Journal of Microbiology** **50**: 521-577 (1.118)
15. (\*) **de-Bashan L.E.** and Bashan Y. 2004. Recent advances in removing phosphorus from wastewater and its future use as fertilizer (1997–2003). **Water Research** **38**: 4222-4246 (2.304)
16. Bashan, Y. and **de-Bashan, L.E.** 2005. Fresh-weight measurements of roots provide inaccurate estimates of the effects of plant growth-promoting bacteria on root growth: a critical examination. **Soil Biology and Biochemistry** **37**:1795-1804 (2.414)
17. (\*) **de-Bashan, L.E.**, Antoun, H., and Bashan, Y. 2005. Cultivation factors and population size control uptake of nitrogen by the microalgae *Chlorella vulgaris* when interacting with the microalgae growth-promoting bacterium *Azospirillum brasilense*. **FEMS Microbiology Ecology** **54**: 197-203 (2.787)
18. Hernandez, J.-P., **de-Bashan, L.E.** and Bashan Y. 2006. Starvation enhances phosphorus removal from wastewater by the microalga *Chlorella* spp. co-immobilized with *Azospirillum brasilense*. **Enzyme and Microbial Technology** **38**: 190-198 (1.897)
19. Holguin, G., Gonzalez-Zamorano P., **de-Bashan L.E.**, Mendoza, R., Amador E. and Bashan, Y. 2006. Biological and physicochemical indicators in healthy arid mangroves facing urban development encroachment to establish 'natural' baselines for management - a case study. **Science of the Total Environment** **363**: 260-274 (2.359)
20. Bashan, Y., Vierheilig, H., Salazar, B., and **de-Bashan, L.E.** 2006. Primary colonization and breakdown of volcanic rocks by the endemic elephant tree (*Pachycormus discolor*) of Baja California deserts. **Naturwissenschaften** **93**: 344–347 (2.021)
21. **de-Bashan L.E.**, Trejo A., Huss V.A.R., Hernandez J.-P. and Bashan, Y. 2008. *Chlorella sorokiniana* UTEX 2805, a heat and intense, sunlight-tolerant microalga with potential for removing ammonium from wastewater. **Bioresource Technology** **99**: 4980-4989 (4.453).
22. (\*) **de-Bashan, L.E.**, Antoun, H., and Bashan Y. 2008. Involvement of indole-3-acetic-acid produced by the growth-promoting bacterium *Azospirillum* spp. in promoting growth of *Chlorella vulgaris*. **Journal of Phycology** **44**: 938–947 (2.811)
23. (\*) **de-Bashan, L.E.**, Magallon, P., Antoun, H, and Bashan, Y. 2008. Role of glutamate dehydrogenase and glutamine synthetase in *Chlorella vulgaris* during assimilation of ammonium when jointly immobilized with the microalgae-growth-promoting bacterium *Azospirillum brasilense*. **Journal of Phycology** **44**: 1188–1196 (2.811)
24. (\*) **de-Bashan, L.E.**, and Bashan Y. 2008. Joint immobilization of plant growth-promoting bacteria and green microalgae in alginate beads as an experimental model for studying plant-bacterium interactions. **Applied and Environmental Microbiology** **74**: 6797–6802 (3.801).
25. Hernandez, J.-P., **de-Bashan, L.E.**, Rodriguez, D.J., Rodriguez, Y., and Bashan, Y. 2009. Growth promotion of the freshwater microalga *Chlorella vulgaris* by the nitrogen-fixing, plant growth-promoting bacterium *Bacillus pumilus* from arid zone soils. **European Journal of Soil Biology** **45**: 88-93 (0.888)
26. (\*\*)**de-Bashan, L.E.**, and Bashan, Y. 2009. Immobilized microalgae for removing pollutants: Review of practical aspects. (In Press) doi:10.1016/j.biortech.2009.09.043. **Bioresource Technology** (4.453)
27. Bashan, Y., and **de-Bashan, L.E.** 2010. How the plant growth-promoting bacterium *Azospirillum* promotes plant growth--a critical assessment. **Advances in Agronomy** **107**: (commissioned paper) (3.114).

28. Perez-Garcia, R.O., **de-Bashan, L.E.**, Hernandez, J.-P., and Bashan, Y. 2009. Efficiency of ammonium removal from municipal wastewater by heterotrophic, autotrophic, and mixotrophic cultures of *Chlorella vulgaris* jointly immobilized with *Azospirillum brasilense*. **Journal of Phycology** (2.811).(accepted)

**Submitted publications: 3** (unavailable until published)

Peer-reviewed journal	No. Publications	Impact factor*
Canadian Journal of Microbiology	4	1.071-1.118
Water Research	4	1.611-2.304
Applied and Environmental Microbiology	3	3.389–3.801
Bioresource Technology	3	0.417-4.453
Journal of Phycology	3	2.811
Advances in Agronomy	1	3.114
Applied Microbiology and Biotechnology	1	1.641
Enzyme and Microbial Technology	1	1.897
European Journal of Plant Pathology	1	1.475
European Journal of Soil Biology	1	0.888
FEMS Microbiology Ecology	1	2.787
Natural Areas Journal	1	0.452
Naturwissenschaften	1	2.021
Plant Biology	1	1.352
Science of the Total Environment	1	2.359
Soil Biology & Biochemistry	1	2.414

\*Range of impact factor (Journal Citation Reports®, Thomson Reuters) at the time of publication

Accumulative impact of all papers in refereed journals: 61.261

**Average “Impact Factor” of refereed papers: 2.187**

**Citations in peer-reviewed Journals and books (to December 2008): 293**

**Publications in languages other than English and popular scientific publications: 16**

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34. **Gonzalez-Bashan, L.E.** 2001. Cardon man. **Wildflower** 17 (1): 9. (English) (Canada).
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37. **de-Bashan L.E.**, Hernandez J.-P., and Bashan Y. 2003. Bacteria used in agriculture to increase growth of microalgae used in wastewater treatment. **Gaceta Biomédica** 8 (4): 8-9. (In Spanish)(Mexico)
38. Bashan, Y., Moreno, M., **de-Bashan, L.E.**, Leyva L.A. and Leon de La Luz J.-L. 2003. Crawling devil: a rare and mobile desert cactus. **Wildflower** 19 (4): 38-42. (English) (Canada).
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43. Bashan, Y., Puente M.E., Salazar, B., **de-Bashan, L.E.**, Bacilio, M., Hernandez, J.-P., Leyva L.A., Romero, B., Villalpando R., and Bethlenfalvay G.J. 2005. Reforestation of desert eroded soils: the role of plant growth-promoting bacteria and organic matter. (Reforestación de tierras erosionadas en el desierto: el papel de las bacteria promotoras de crecimiento en plantas y la material orgánica). **Suelos Ecuatoriales** 35: 70-77. (In Spanish)(Colombia).
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#### II International books: 3

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54. Lebsky, V.K., **Gonzalez, L.E.**, Carrillo, A., and Bashan, Y. 2000. Ultrastructure of coimmobilization of the microalga *Chlorella vulgaris* with the plant growth-promoting bacterium *Azospirillum brasilense* and with its natural associative bacterium *Phyllobacterium myrsinacearum* in alginate beads. In: **Nitrogen fixation: from molecules to crop productivity**. (eds.) Pedrosa, F.O., Hungria, M., Yates, G., and Newton, W. Kluwer Academic publishers, Dordrecht, The Netherlands. p. 583.
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2. National Symposium “Biological diversity, conservation and management of the highland ecosystems in Colombia”. Universidad de Los Andes. June 10 of 1994. Bogotá, Colombia. (Participant).
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4. **Gonzalez, L.E.**, and Bashan, Y. 1999. The plant growth-promoting bacterium *Azospirillum* sp. combined with microalgae as a novel wastewater treatment. 6<sup>th</sup> Symposium on Bacterial Genetics and Ecology. June 20-24, 1999. Florence, Italy. p. 59.

5. **Gonzalez, L.E.**, Lebsky, V.K. and Bashan, Y. 1999. Growth promotion of the fresh water microalgae *Chlorella vulgaris* when co-immobilized and co-cultured in alginate beads with plant growth-promoting bacterium *Azospirillum brasilense*. 6<sup>th</sup> Symposium on Bacterial Genetics and Ecology. June 20-24, 1999. Florence, Italy. p. 72.
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