

The "Environmental Microbiology" Group at CIBNOR

Productivity: Final 2013

(Numbers in parenthesis adjacent a journal's name are the impact factor, 2012)

SUMMARY

- Original publications in peer-reviewed journals with Impact factor	
- Published and "in press" -	7
- Submitted papers -	6
- Publications in books -	3
- Publications in websites -	1
- Invited presentations at conferences/seminars	13
- Voluntary presentation at conferences	1
- Review of manuscripts for international and national journals and funding agencies	71

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- Total productivity (without conferences, reviews and websites) for 2013: 16

- **Average "Impact Factor" of all published papers in 2013: 2.772**

PUBLISHED AND "IN PRESS" PUBLICATIONS IN PEER-REVIEWED JOURNALS WITH AN IMPACT FACTOR

1. Bashan, Y., Kamnev, A.A., and de-Bashan, L.E. 2013. A proposal for isolating and testing phosphate-solubilizing bacteria that enhance plant growth. **Biology and Fertility of Soils** 49: 1-2. (2.505)
2. Bashan, Y., Moreno, M., Salazar, B.G., and Alvarez, L. 2013. Restoration and recovery of hurricane-damaged mangroves using the knickpoint retreat effect and tides as dredging tools. **Journal of Environmental Management** 116: 196-203 (3.057)
3. Bashan, Y., Kamnev, A.A., and de-Bashan, L.E. 2013. Tricalcium phosphate is inappropriate as a universal selection factor for isolating and testing phosphate-solubilizing bacteria that enhance plant growth: a proposal for an alternative procedure. **Biology and Fertility of Soils** 49: 465-479 (2.505)
4. Cruz, I., Bashan, Y., Hernández-Carmona, G., and de-Bashan, L.E. 2013. Biological deterioration of alginate beads containing immobilized microalgae and bacteria during tertiary wastewater treatment. **Applied Microbiology and Biotechnology** 97: 9847-9858 (3.689)
5. Lopez, B.R., Bashan, Y., Trejo, A., and de-Bashan, L.E. 2013. Amendment of degraded desert soil with wastewater debris containing immobilized *Chlorella sorokiniana* and *Azospirillum brasilense* significantly modifies soil bacterial community structure, diversity, and richness. **Biology and Fertility of Soils** 49: 1053-1063 (2.505)

6. Bashan, Y., de-Bashan, L.E., Prabhu, S.R., and Hernandez, J.-P. 2013. Advances in plant growth-promoting bacterial inoculant technology- formulations and practical perspectives (1998-2013). (a Marschner Review). **Plant and Soil** (Published on line DOI: 10.1007/s11104-013-1956-x) (2.638)
7. Palacios, O.A., Bashan, Y., and de-Bashan, L.E. 2013. Proven and potential involvement of vitamins in interactions of plants with plant growth-promoting bacteria—an overview. **Biology and Fertility of Soils** (2.505) (accepted)

PUBLICATIONS IN NATIONAL BOOKS (In Spanish; Argentina and Mexico)

1. de-Bashan, L.E., Hernandez, J.-P. and Bashan, Y. 2013. Plant growth-promoting bacteria as a component for environmental improvement [Bacterias promotoras de crecimiento vegetal como componentes en el mejoramiento ambiental]. In: **Rizosfera, biodiversidad y agricultura sustentable**. Garcia de Salomone, I.E., Vazquez, S., Penna, C., and Cassan, F. (Eds), Published by: Asociacion Argentina de Microbiologia, Buenos Aires, Argentina. Chapter 14. pp. 261-285.
2. de-Bashan, L.E., Vazquez, P., Lopez, B.R., Moreno, M., Hernandez, J.-P., Bacilio, M., Leyva, L.A., and Bashan, Y. 2013. The smallest and the biggest: how desert microbes may help the plants [Los pequeños y los grandes: Una historia de cómo los micro-organismos pueden ayudar a las plantas]. In: **¿Qué se mueve en el Desierto? Historias del Matorral Sarcocaulis**. León de la Luz, J.L., Blázquez-Moreno M.C., and Ortega-Rubio, A. (Eds). Published by: Centro de Investigaciones Biológicas del Noroeste. La Paz, BCS., Mexico. Chapter 5. pp. 45-54.
3. de-Bashan, L.E., and Bashan, Y. 2013. Microorganismos utilizados en la recuperación de suelos erosionados y ecosistemas degradados en México. In: **Biodiversidad Microbiana de México**. (Eds): Álvarez Sánchez J., Rodríguez Guzmán, P. and Alarcón, A. Chapter 24. Published by: SAGARPA, Mexico City, Mexico, (accepted)

PUBLICATION IN WEBSITE

1. Gonzalez de Bashan, L.E., and Bashan Y. 2013. Reforestation of eroded lands in the desert; the role of plant growth-promoting bacteria and organic matter. [Reforestación de tierras erosionadas en el desierto: el papel de las bacterias promotoras de crecimiento en plantas y la material orgánica]. **El Universal** (Mexico). 16.4. 2013. Electronic version of the newspaper. http://blogs.eluniversal.com.mx/weblogs_detalle18216.html

SUBMITTED PUBLICATIONS

SCIENTIFIC INTERNATIONAL REVIEWED JOURNALS

1. Choix, F.J., Bashan, Y., Mendoza, A., and de-Bashan, L.E. 2013. Enhanced activity of ADP glucose pyrophosphorylase and formation of starch induced by *Azospirillum brasilense* in *Chlorella vulgaris*. **Applied Microbiology and Biotechnology** (3.689)

2. Leyva, L.A., Bashan Y., and de-Bashan, L.E. 2013. Co-immobilisation of *Chlorella vulgaris* with *Azospirillum brasilense* in alginate enhances accumulation of lipids and activity of acetyl-CoA carboxylase, under autotrophic and heterotrophic conditions. **Annals of Microbiology** (1.549)
3. Ramírez-Elias, M.A., Ferrera-Cerrato, R., Alarcón, A., Almaráz, J.J., Ramírez-Valverde, G., de-Bashan, L.E., Esparza-García, F.J., and García-Barradas, O. 2013. Characterization of culturable microbial functional groups isolated from the rhizosphere of four types of mangroves at the Terminos lagoon, Mexico. **Applied Soil Ecology** (2.106)
4. Bacilio, M., Moreno, M., and Bashan, Y. 2013. Mitigation of negative effects of progressive soil salinity gradient in peppers by application of humic acids and inoculation with *Pseudomonas stutzeri*. **Environmental and Experimental Botany** (2.578)
5. Meza, B., de-Bashan, L.E., and Bashan, Y. 2013. Involvement of indole-3-acetic acid produced by *Azospirillum brasilense* in accumulation of intra-cellular ammonium in *Chlorella vulgaris*. **Plant Physiology and Biochemistry** (2.775)
6. Meza, B., de-Bashan, L.E., Hernandez, J.-P., and Bashan, Y. 2013. Relatedness of accumulation of intra-cellular polyphosphate in *Chlorella vulgaris* cells to indole-3-acetic acid produced by *Azospirillum brasilense*. **Plant Physiology and Biochemistry** (2.775)

PRESENTATIONS AT CONFERENCES: (the invitee and the presenter = first author)

1. Lopez, B.R. 2013. Bacterias endófitas: Diversidad, evolución y efecto en las plantas. Seminar of the Academy of Biotechnology. The Northwestern Center for Biological Research, April 5, 2013. La Paz, B.C.S., Mexico (**Invited lecture**).
2. de-Bashan, L.E. and Bashan, Y. 2013. Use of PGPB and microalgae for biotreatment of wastewater and restoration of desert eroded soils. [Utilización de PGPBs y microalgas para el biotratamiento de aguas residuales y recuperación de suelos desérticos erosionados]. Special seminar in: Universidad del Bosque, May 7, 2013, Bogota, Colombia. (**Invited lecture**).
3. Bashan, Y., Hernandez, J.-P, Moreno, M., and de-Bashan, L.E. 2013. Development of slow release inoculants for agricultural and environmental use. [Desarrollo de inoculantes de lenta liberación con aplicación agrícola y ambiental]. In: 5th International Congress of Industrial Microbiology, May 7-10, 2013, Bogota, Colombia. p.67. (**Invited lecture**).
4. Bashan, Y. and de-Bashan, L.E. 2013. Uso de bacterias promotoras de crecimiento en la restauración de suelos erosionados. In: Simposio uso de bacteria promotoras de crecimiento vegetal (PGPB) para la recuperación de ambientes degradados por minería. May 14, 2013, Medellín, Colombia (**Invited lecture**).
5. de-Bashan, L.E., and Bashan, Y. 2013. Fitoestabilización de residuos mineros con ayuda de bacterias promotoras de crecimiento. In: Simposio uso de bacteria promotoras de crecimiento vegetal (PGPB) para la recuperación de ambientes degradados por minería. May 14, 2013, Medellín, Colombia (**Invited lecture**).

6. Bashan, Y., and de-Bashan, L.E. 2013. *Azospirillum*: How does it really work and what are its applications? In: 10th Soil Health Symposium of the USDA-NRCS (Natural Resource Conservation Service). June 5, 2013, Indio, California, USA (**Invited lecture**)
7. de-Bashan, L.E. and Bashan, Y. 2013. *Azospirillum* y microalgas verdes: un conveniente modelo para el estudio básico de las interacciones planta-bacteria. 38th Congress of the Mexican Association of Microbiology, June 23-26, 2013. Guanajuato, Mexico (**Invited lecture**)
8. Bashan, Y., and de-Bashan, L.E. 2013. Use of plant growth-promoting bacteria in environmental restoration [Uso de bacterias promotoras de crecimiento vegetal en la restauración ambiental]. 38th Congress of the Mexican Association of Microbiology, June 23-26, 2013. Guanajuato, Mexico (**Invited lecture and Chairman of a session**)
9. Cordero, T A., Lopez B.R., Bashan Y. 2013. El aporte del Bioterio en la Bioremediación Ambiental: Inmunolocalización por medio de anticuerpos policlonales de bacterias endófitas y movilización de elementos minerales en la cactácea *Mammillaria fraileana* endémica del sur del Desierto Sonorense. IX Congreso Internacional AMCAL, Junio 26-29 de 2013, Mérida Yucatán.
10. de-Bashan, L.E. and Bashan, Y. 2013. Phytostabilization of mine tailings in arid zones. First International Symposium on Biodiversity, Management and Conservation of Arid Ecosystems, September 25-27, 2013, Riohacha, Colombia. (**Invited lecture**)
11. Bashan, Y., Moreno, M., and de-Bashan, L.E. 2013 Restoration of arid mangrove ecosystems. First International Symposium on Biodiversity, Management and Conservation of Arid Ecosystems, September 25-27, 2013, Riohacha, Colombia. (**Invited lecture**)
12. Bashan, Y., de-Bashan, L.E., Lopez, B.R., and Moreno, M., 2013 Restoration of degraded arid lands aided by beneficial microorganisms. Seminar in: School of Engineering at University of the Guajira, September 27, 2013, Riohacha, Colombia. (**invited lecture**)
13. Lozano, N.E. 2013. Sucesión y ensamble de comunidades microbianas. Video Seminar: Universidad el Bosque de Bogota, Colombia. November 12, 2012. (**invited lecture**).
14. Bashan, Y., de-Bashan, L.E., Lopez, B.R., and Moreno, M., 2013 Restoration of degraded arid lands aided by beneficial microorganisms. 38th national congress of soil science. November 24-29, 2012, La Paz, Mexico. (**Plenary speaker and Chairman of session**)

DOMESTIC OUTREACH AND COMMUNITY SERVICES

1. **Strategic line of research of CIBNOR.** The use of plant growth-promoting bacteria to solve environmental problems in the desert. (Prof. Yoav Bashan, Dr. Luz de-Bashan, and Dr. Macario Bacilio) (CIBNOR internal code: P.C. 6.0)
2. 2013 – **Elected secretary** and responsible for the weekly seminar of the “Academia de Biotecnología” of CIBNOR (Dr. Luz de-Bashan)

3. 2013- A **TV program**. Soil restoration [Restoracion de suelos]. In: "Tiempo de ciencia", Channel 8, La Paz, Mexico, February 27, 2013. (Dr. Luz de-Bashan)

SCIENTIFIC RECOGNITION AND INTERNATIONAL SERVICES

4. **The National Mexican Prize in Soil Biology "Dr. Jesús Caballero Mellado"**. ["Premio al mérito en biología del suelo Dr. Jesús Caballero Mellado"]. Awarded by Mexican Society of Soil Science, Chapingo, Mexico, November 25, 2013. (Prof. Yoav Bashan)
5. **2014 – 2017. Promoted to the rank of "National Researcher Level 2"** by the National research system (Sistema Nacional de Investigadores, SNI) of Mexico. (Dr. Luz de-Bashan).
6. **Invited as foreign evaluators of the Central America agency for accredit graduate schools in Central America**, Tegucigalpa, Honduras for accredit Master in Science in the University of Panama (Dr. Luz de-Bashan and Prof. Yoav Bashan).
7. **Organization of a scientific session**. "Interacciones entre plantas y microorganismos". The 38th Congress of the Mexican Society of Microbiology, 23-26.6. 2013, Guanajuato, Mexico. (Prof. Yoav Bashan)
8. **Review of manuscripts** for journals, funding agencies and foreign universities: **Total: 71**

Reviewer	Journal, University or Funding Agency	Country	Number of manuscripts
Yoav Bashan	Water Research	The Netherlands	4
	Applied Soil Ecology	The Netherlands	5
	Biotechnology Advances	The Netherlands	1
	Chemosphere	The Netherlands	1
	Science of the Total Environment	The Netherlands	1
	Algal Research	The Netherlands	1
	Biology and Fertility of Soils	Germany	6
	Plant and Soil	Germany	4
	Agronomy and Sustainable Development	Germany	1
	Journal of Applied Phycology	Germany	4
	Environmental Science and Pollution Research	Germany	1
	Plant Biology	Germany	1
	Bioprocess and Biosystems Engineering	Germany	1
	Journal of Hazardous Materials	Germany	1
	European Journal of Plant Pathology	Germany	1
	Agronomy	Switzerland	1
	Desalinization and Water Treatment	USA	1
	Land Degradation and Development	USA	1
	Preparative Biochemistry and Biotechnology	UK	1
	International Journal of Phytoremediation	UK	1
Journal of Applied Microbiology	UK	3	
SpringerPlus	UK	1	

	Canadian Journal of Microbiology	Canada	2
	University of Manitoba	Canada	1
	University of Buenos Aires	Argentina	1
	Birla Institute of Scientific Research	India	1
	CONACYT- infrastructure proposals	Mexico	1
Luz de-Bashan	Water Research	The Netherlands	3
	Food Chemistry	The Netherlands	1
	European Journal of Soil Biology	The Netherlands	3
	Biology and Fertility of Soils	Germany	4
	Plant and Soil	Germany	1
	Microbial Ecology	Germany	1
	International Journal of Environmental Technology and Management	Switzerland	1
	Canadian Journal of Civil Engineering	Canada	2
	McGill University	Canada	1
	Revista Argentina de Microbiologia	Argentina	1
	CONACYT- infrastructure proposals	Mexico	4
	CONACYT- Innovations proposals	Mexico	1

EXTERNAL RESEARCH PROJECTS

(total:\$5,644,000 pesos)(= US\$434,000) (13 Mexican pesos = 1 USD).

“Physiological and genetic mechanisms in the establishment and maintenance of mutualisms of plants with different partners.”

Funding: MN\$4,380,000; Funded by CONACYT (investigacion basica)

Duration: Four years (2011–2014).

PI: Prof. Yoav Bashan

Co-PI: Dr. Luz E. de-Bashan and Prof. Martin Heil (CINVESTAV, Irapuato)

“Influence of biochar and compost in the phytoremediation of oil contaminated soil.”

Funding: MN\$307,000. Funded by UC-Mexus

Duration: 18 months (July 2011–December 2013)

PIs: Dr. Macario Bacilio (Mexico); Prof. David Crowley (UC Riverside, USA)

“Asociación microalga- bacterias promotoras de crecimiento vegetal—Efecto de la ficosfera y exudados bacterianos en el establecimiento y mantenimiento de la interacción cuando están inmovilizadas en esferas de alginato.”

Funding: MN\$650,000; Funded by CONACYT (investigacion basica)

Duration: 3 years (2012–014)

PI: Dr. Luz de-Bashan

Co-PI: Prof. Yoav Bashan

"Searching for bacteria living in the rhizosphere of native desert plants in the Sonoran Desert that restore soil fertility to degraded land in Baja California".

Funding: MN\$307,000. Funded by UC-Mexus

Duration: 18 months (July 2013–December 2014)

PIs: Dr. Luz de-Bashan (Mexico); Prof. Ann Hirsch (UCLA, USA)

Co-PI: Prof. Yoav Bashan

PERSONNEL IN 2013

(SNI-National academic ranking according to the National Research System of Mexico; Candidate<1< 2< 3; H-index and citations according to Google Scholar)

Researchers (full time)

1. Dr. Luz Gonzalez de-Bashan (SNI level 2; H-index-24; citations-2860)
2. Prof. Yoav Bashan (SNI level 3; H-index-54; citations-10,158)
3. Dr. Macario Bacilio (SNI level 1)

Research staff (full-time)

4. M.Sc. Manuel Moreno
5. M.Sc. Juan-Pablo Hernandez (SNI level 1; H-index-13; citations-757)

Post-Doctoral fellow (full time)

6. Dr. Blanca Lopez (SNI Candidate level)
7. Dr. Esmeralda Lopez

Sabbatical year (part time)

8. Dr. Lily Pereg (University of New England, Australia)

Graduate students (Research, full time)

9. **Beatriz Meza. M.Sc. Graduated March 5, 2013.** (CIBNOR, La Paz, Mexico). (With Dr. Luz de-Bashan).
10. M.Sc. Luis Leyva. **D.Sc.** Student since 2009 (CIBNOR, La Paz, Mexico). (With Prof. Yoav Bashan and Dr. Luz de-Bashan).
11. M.Sc. Francisco Choix. **D.Sc.** Student, since 2010. (CIBNOR, La Paz, Mexico). (With Prof. Yoav Bashan and Dr. Luz de-Bashan).
12. M.Sc. Oskar Palacios, **D.Sc.** Student, since 2011. (CIBNOR) La Paz, Mexico. (With Prof. Yoav Bashan and Dr. Luz de-Bashan).
13. Eng. Emmanuel Vidaña , **M.Sc** student, since 2011. (CIBNOR), La Paz, Mexico. (With Prof. Yoav Bashan).
14. Eng. Edgar Amavizca , **M.Sc** student, since 2011. (CIBNOR), La Paz, Mexico. (With Dr. Luz de-Bashan).
15. Eng. Cristina Galaviz. **M.Sc** student, since 2012 (CIBNOR), La Paz, Mexico. (With Prof. Yoav Bashan).
16. Biol. Edisa Garcia. **M.Sc** student, since 2012 (CIBNOR), La Paz, Mexico (With Prof. Yoav Bashan).
17. Biol. Paulina Adams. **M.Sc** student since 2013. (CIBNOR), La Paz, Mexico. (With Dr. Luz de-Bashan).

Training

18. Biol. Lourdes Vital. February 4-March 30, 2013. (Center of Genomic Biotechnology), Reynosa, Mexico (With Dr. Luz de-Bashan).

Webmaster-in-Chief

M.Sc Juan-Pablo Hernández

Group's aid

Biol. Cynthia Lucero

INTERNATIONAL AND NATIONAL COLLABORATIONS IN 2013

(in: projects, publications and supervising of graduate students in chronological order of cooperation)

1. **Prof. Hani Antoun**. Laval University, Quebec (**Canada**). Water Bioremediation.
2. **Dr. S.R. Prabhu**, TerraBioGen Technologies. Vancouver (**Canada**). Inoculant information from developing countries.
3. **Prof. Anton Hartmann and Dr. Michael Schmid**. German Research Center for Environmental Health, München, (**Germany**). FISH and plant-bacteria interactions.
4. **Prof. Martin Heil**, CINVESTAV (Guanajuato, **Mexico**). Mutualism between microalgae and bacteria.
5. **Dr. Michael Cohen** –Sonoma State University, California (**USA**). Enzymatic and molecular mechanisms of fatty acids in microalgae and tertiary wastewater treatment.
6. **Dr. Alberto Mendoza**- CBG-IPN, Reynosa, Tamaulipas (**Mexico**). Enzymatic and molecular mechanisms of fatty acids in microalgae.
7. **Prof. Chris Rensing**- University of Copenhagen (**Denmark**). Enzymatic and molecular mechanisms of fatty acids in microalgae.
8. **Prof. Felipe Ascencio** CIBNOR, La Paz, (**Mexico**). Enzymatic and molecular mechanisms of fatty acids in microalgae.
9. **Prof. Jesus Cordova**, University of Guadalajara (**Mexico**). Carbohydrate and starch production by microalgae.
10. **Prof. Gustavo Hernandez-Carmona**, IPN-CICIMAR, La Paz, (**Mexico**). Scaling up wastewater treatment.
11. **Prof. Joseph Kloepper and M.Sc. John McInroy**, Auburn University, Auburn (**USA**). FISH techniques for detection of PGPB (not active in 2013).
12. **Prof. Beatriz Baca**, Autonomous University of Puebla (**Mexico**). Indole-3-acetic acid regulation in *Azospirillum*.
13. **Dr. Cecilia Creus**, University of Mar de Plata, Balcarce (**Argentina**). Signal molecules in *Azospirillum*.
14. **Prof. Gabriela Olmedo**, CINVESTAV (Guanajuato, **Mexico**). Mutualism between microalgae and bacteria.
15. **Dr. Claudio Penna**, Stoller Co., **Brazil/Argentina**. Synthetic inoculants for plant growth-promoting bacteria (not active in 2013).
16. **Dr. Fabricio Cassan**. University of Rio Cuarto, **Argentina**. Synthetic inoculants for plant growth-promoting bacteria. (not active in 2013)
17. **Prof. David Crowley**. University of California-Riverside (**USA**). Phytoremediation of oil-contaminated soil using biochar.
18. **Dr. Gracia Gomez** –CIBNOR (**Mexico**). Genetic manipulation of microalgae.

19. **Prof. Ann Hirsh**, University of California-Los Angeles (**USA**). Microorganisms of the desert.
20. **Dr. Choong-Min Ryu**. Korean Institute of Bioscience and Biotechnology, Daejeon, (**Korea**). Volatiles in *Azospirillum*.
21. **Dr. S. Y. Park**. Korean Institute of Bioscience and Biotechnology, Daejeon, (**Korea**). Molecular biology of desert bacilli.
22. **Prof. Rainer Borriss**. Humboldt University (**Germany**). Molecular biology of desert bacilli.
23. **Prof. Alexander Kamnev**. Institute of Biochemistry and Physiology of Plants and Microorganisms (**Russia**). Phosphate solubilizing bacteria
24. **Dr. Alan Pamella**. Laboratorio Farroupilha. (**Brazil**). Improvements of commercial inoculants.
25. **Dr. Cesar Arriagada**. University of la Frontera (**Chile**). Bioremediation of mine tailings.
26. **Dr. Lily Pereg**. University of New England, (**Australia**). Specificity and affinity of *Azospirillum* for plants.