

The Group of "Environmental Microbiology"- CIBNOR

Final productivity 2008

(Numbers in parenthesis near journal's name are the scientific impact, 2007)

Summary

- Original publications in peer-reviewed, scientific <u>international</u> journals.	
Published and "in press" -	9
- Publications in a national journal	1
- Submitted papers -	8
- Publications in books -	5
- Publications in websites -	1
- Presentations in conferences	15
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- Total productivity (without conferences) for 2008	24

- **Average "Impact Factor" of all published papers in 2008: 2.871**

PUBLISHED AND "IN PRESS" PUBLICATIONS

PUBLICATIONS IN SCIENTIFIC INTERNATIONAL REVIEWED JOURNALS

1. 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).
2. Strangmann, A., Bashan, Y. and Giani, L. 2008. Methane in pristine and impaired mangrove soils and its possible effect on establishment of mangrove seedlings. **Biology and Fertility of Soils** 44: 511-519 (1.446).
3. 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)
4. Leyva L.A. and Bashan, Y. 2008. Activity of two catabolic enzymes of the phosphogluconate pathway in mesquite roots inoculated with *Azospirillum brasilense* Cd. **Plant Physiology and Biochemistry** 46: 898-904 (1.905).

5. 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).
6. 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)
7. Hartmann A., and Bashan, Y. 2009. Ecology and application of *Azospirillum* and other plant growth-promoting bacteria (PGPB) - special issue. **European Journal of Soil Biology** 45: 1-2 (0.888)
8. 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)
9. Lopez, B.R., Bashan, Y., Bacilio, M., De la Cruz-Agüero, G. 2009. Rock-colonizing plants: Abundance of the endemic cactus *Mammillaria fraileana* related to rock type in the southern Sonoran Desert. **Plant Ecology** 200: (In press) (1.73)

PUBLICATION IN NATIONAL JOURNAL

1. Holguin-Zehfuss, G.[†] 2008. La comunicación entre bacterias y plantas. **Ciencia** 59 (2): 72-78.

PUBLICATIONS IN INTERNATIONAL BOOKS

2. Bashan, Y., Puente M. E., de-Bashan L.E., and Hernandez J.-P. 2008. Environmental uses of plant growth-promoting bacteria. In: **Plant-Microbe interactions**. (Ed). E. Ait Barka and C. Clément. Chapter 4. pp. 69-93. Research Signpost, Trivandrum, Kerala, India
3. de-Bashan, L.E., and Bashan Y. 2008. Bacterias promotoras de crecimiento en plantas y microalgas verdes: un modelo conveniente para el estudio basico de las interacciones planta-bacteria. In: **Azospirillum sp.: cell physiology, plant interactions and agronomic research in Argentina**. F. D. Cassan and I. Garcia de Salamone (Eds.). Published by: Asociacion Argentina de Microbiologia, Buenos Aires, Argentina. Chapter 2. pp. 37-48.

4. Bashan, Y., de-Bashan, L.E. and Toledo G. 2009. Restoration of mangroves by plant-microbe interaction in the arid environment of Baja California Sur, Mexico. In: **Revised World Atlas of Mangrove for Conservation and Restoration of Mangrove Ecosystems**. Spalding M. and Kainuma, M. (Eds). Published by: International Society for Mangrove Ecosystems, Okinawa, Japan (commissioned paper).

PUBLICATIONS IN NATIONAL BOOKS

5. Bashan, Y. 2008. Prólogo. El uso de inoculantes microbianos como una importante contribución al futuro de la agricultura mexicana. In: **La biofertilización como tecnología sostenible**. (Eds.) Díaz-Franco, A., Mayek-Pérez, N. Published by: Plaza y Valdéz, Editores, Mexico City, Mexico. pp. 17-23.
6. Bashan, Y., de-Bashan, L.E., Hernandez, J.-P., Puente, M.E., Bacilio, M., and Leyva , L.A. 2008. Inoculantes microbianos sintéticos: ¿son el futuro? In: **La biofertilización como tecnología sostenible**. (Eds.) Díaz-Franco, A., Mayek-Pérez, N. Published by: Plaza y Valdéz, Editores, Mexico City, Mexico. pp. 167-186.

PUBLICATION IN WEBSITES

7. Puente, M. E., Bashan, Y., Rodriguez-Jaramillo C., and Li, C.Y. 2008. Image analysis for quantification of bacterial rock weathering. In: <http://bashanfoundation.org/smallroots.html>

SUBMITTED PUBLICATIONS

PUBLICATIONS IN SCIENTIFIC INTERNATIONAL REVIEWED JOURNALS

1. Puente, M.E., Li, C.Y., and Bashan, Y. 2008. Endophytic bacteria in cacti seeds accelerate rock-weathering. **Environmental and Experimental Botany**
2. Puente, M.E., Li, C.Y., and Bashan, Y. 2008. Endophytic bacteria in cacti seeds are essential for development of cactus seedlings. **Environmental and Experimental Botany**
3. Puente M.E., and Bashan Y. 2008. Survival and pH reduction capacity of rock-weathering, plant growth-promoting bacteria in slurries of rocky substrates. **Geomicrobiology Journal**.
4. de-Bashan, L.E., and Bashan, Y. 2008. Immobilized microalgae for removal of pollutants- a practical review. **Bioresource Technology**

5. Bashan, Y., Salazar, B., Puente, M.E. and Bethlenfalvay, G.J. 2008. Responses of native, legume desert trees used for reforestation to plant growth-promoting microorganisms in screen house. **Biology and Fertility of Soils**
6. Vovides, A.G., Bashan, Y., Lopez-Portillo, J.A., and Guevara R. 2008. Nitrogen fixation in pristine, reforested, and impaired mangrove forests of an arid zone. **Environmental and Experimental Botany**
7. Bashan, Y., Salazar, B., Puente, M. E., and Linderman, R.G. 2008. Reforestation of eroded desert soil with native trees: effects of inoculation with plant growth-promoting microorganisms, limited amounts of compost and water and plant density. **Biology and Fertility of Soils**.
8. Bashan, Y., Salazar, B., Puente, M. E., Bacilio, M., and Linderman, R.G. 2008. Enhanced establishment and growth of the giant cardon cactus in eroded field using plant growth-promoting microorganisms, compost and mixed reforestation with native legume trees. **Biology and Fertility of Soils**.

PRESENTATIONS IN CONFERENCES

1. Bashan, Y. 2008. Plant growth-promoting bacteria: from isolation to application. In: Special seminar in the Dept. of Microbiology, Synthetic Genomics Inc. February 25-26, 2008. La Jolla, California, USA. (**Invited Lecture**).
2. Lopez, B.R., Bashan, Y, Bacilio, M., De la Cruz-Agüero, G. 2008. Correlation of abundance of the endemic rock-dwelling cactus *Mammillaria fraileana* (Britt. & Rose) Boed. with bedrock in the southern Sonoran Desert. In: **International Symposium on Wild Flora in Arid Zones**. March 2008. La Paz, Baja California Sur, Mexico.
3. Bashan, Y. 2008. (i) Plant growth promoting bacteria for “face lifting” severe cases of desertification and, (ii) Plant-bacteria interactions in land reclamation and restoration; Restoration of below-ground ecosystems. Special seminars in the Department of Renewable Resources, College of Agriculture, University of Wyoming, March 31-April 3, 2008. Laramie, Wyoming, USA. (**Invited Lectures**).
4. de-Bashan, L.E., Bashan, Y., Puente, M.E., y Perez-Garcia, R.O. 2008. Recuperación de nutrientes de aguas residuales utilizando inmovilizados celulares microalga-bacteria bajo crecimiento heterotrófico. In: **“36 Congreso Nacional de Microbiología”**, June 4-7, Morelia, Michoacan, Mexico.

5. Rodríguez D.J, Hernández J.P y Bashan Y. 2008. Evaluación de sistemas combinados de *Chlorella sorokiniana* coinmovilizada con *Bacillus* sp. y *Paenibacillus* sp. en esferas de alginato para el tratamiento biológico de agua residual. In: **Congreso Internacional Gestión Sostenible del Agua**. 16-18.7.2008. Medellin, Colombia.
6. Bashan Y. 2008. Plant growth-promoting bacteria for "face-lifting" extreme cases of desertification. In: **Special Departmental Seminar**. Dept. Water, Soil and Environmental Science, University of Arizona. August 18, 2008. Tucson, Arizona, USA (**Invited lecture**).
7. Rodriguez D.J, Hernández J.-P, Bashan, Y. 2008. Efecto de *Bacillus subtilis* y *Paenibacillus* sp. sobre el crecimiento de *Chlorella sorokiniana* coinmovilizadas en esferas de alginato durante procesos de tratamiento biológico de agua residual. In: **XLIII Congreso Nacional de Ciencias Biológicas: "Generación de conocimiento para el desarrollo sostenible"**, October 7-10, 2008, Yopal, Colombia.
8. 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: **58th Canadian Chemical Engineering Conference**, October 19-22, 2008, Ottawa, Canada (**Invited lecture**).
9. 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**).
10. 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**).
11. Bashan, Y., Puente, M.E., Salazar, B., de-Bashan, L.E., and Hernandez, J.-P. 2008. (i) Plant growth-promoting bacteria for "face-lifting" extreme cases of desertification, and (ii) Enhancing the vigor of plants by inoculation with plant growth-promoting bacteria. In: **KRIBB conference on microbial compounds and plant health**. October 21, 2008, Daejeon, Korea. (**Invited Lecture**).pp. 23-25.

12. Bashan, Y., de-Bashan, L.E., Hernandez, J.-P., Puente, M.E., and Salazar, B. 2008. (i) Joint immobilization of plant growth-promoting bacteria and green microalgae in alginate beads as an experimental model for studying plant-bacterium interactions, and (ii) Enhancing the vigor of plants by inoculation with plant growth-promoting bacteria. In: **International Symposium on Beyond Biological Control**. October 22, 2008, Suwon, Korea. (**Invited Lecture**).pp. 93-99.
13. Bashan, Y., de-Bashan, L.E., Puente, M.E., Salazar, B. and Hernandez, J.-P. Enhancing the vigor of plants by inoculation with plant growth-promoting bacteria. In: **International symposium of the Korean Society of Plant Pathology on “New approaches to plant disease management”**. October 23 – 24, 2008. Muju, South Korea. (**Invited Lecture**).pp. 69-70.
14. Hernandez, J.-P., de-Bashan, L.E., Rodriguez, D.J., Rodriguez, Y., and Bashan, Y. 2008. Growth promotion of the freshwater microalga *Chlorella vulgaris* by the nitrogen-fixing, plant growth-promoting bacterium *Bacillus* sp. from arid zone soils. In: **8th national congress on biological nitrogen fixation**. October 29 – 31, 2008. Cuernavaca, Morelos, Mexico. (**Invited Lecture**). P. 24.
15. Vovides, A.G., Bashan, Y. Lopez-Portillo, J.A., and Guevara, R. 2008. Fijacion de nitrogeno como indicador de restauracion funcional en manglares reforestados de zonas aridas de Mexico. In: **8th national congress on biological nitrogen fixation**. October 29 – 31, 2008. Cuernavaca, Morelos, Mexico. P. 26.

REGIONAL COMMUNITY SERVICES

1. **Plant growth-promoting bacteria to solve environmental problems. Strategic internal project** of CIBNOR (Dr. Yoav Bashan, Dra. Esther Puente, Dra. Luz de-Bashan and Dr. Macario Bacilio) (P.C. 6.0)

SCIENTIFIC RECOGNITION AND INTERNATIONAL COMMUNITY SERVICES

1. **National recognition.** Two mangrove ecosystems were declared protected areas on 2 February 2008 by the Federal Government of Mexico. The mangroves are among eight that will be protected as part of a program of prioritizing conservation within the "Ramsar International Agreement for Conservation of Wetlands." The two ecosystems (the estuary at Balandra and the El Mogote sand bar at La Paz, B.C.S.) were restored in the previous decade by our group, under the guidance of Yoav Bashan, Gina Holguin (deceased), Gerardo Toledo, and Bernardo Salazar.
2. **Invited to serve as Editor-in Chief;** “The Open Forest Science Journal”, Bentham Science Publishers, NY., USA (April 16, 2008) (Yoav Bashan).

3. **Invited to serve as editorial board member**; “Agronomía Colombiana”. Published by the Colombian National University, Bogota, Colombia (December 12, 2008) (Yoav Bashan).
4. **Membership in scientific foreign organization**. Nominated as a sponsored, foreign member to the New York Academy of Sciences. 2008-2010. (July 1, 2008) (Yoav Bashan and Luz de-Bashan).
5. **Best poster presentation of a graduate student**: The poster: *Rodríguez D.J, Hernández J.P y Bashan Y. 2008. Evaluación de sistemas combinados de Chlorella sorokiniana coinmovilizada con Bacillus sp. y Paenibacillus sp. en esferas de alginato para el tratamiento biológico de agua residual* presented by Johana Rodríguez won the first prize award for poster presentation in: **Congreso Internacional Gestión Sostenible del Agua**. 16-18.7.2008. Medellín, Colombia.
6. **Revision of manuscripts for national and International Journals and funding agencies: Total: 40**

Reviewer	Journal, funding agency or University	Country	Number of manuscripts
Yoav Bashan	Nature	UK	1
	Soil Biology and Biochemistry	UK	1
	Bioresource Technology	UK	2
	Applied and Environmental Microbiology	USA	1
	Desalinization	USA	1
	Biotechnology Progress	USA	1
	Biology and Fertility of Soils	Germany	8
	Applied Microbiology and Biotechnology	Germany	1
	Water Research	The Netherlands	1
	European Journal of Soil Biology	The Netherlands	6
	Journal of Arid Environment	The Netherlands	1
	Environmental and Experimental Botany	France	1
	Research in Microbiology	France	1
	Journal of Applied Phycology	Australia	1
	Botany	Canada	1
	Canadian Journal of Plant Science	Canada	1
	Agrociencia	Mexico	1
	National Science Foundation-international research fellowship program	USA	1
Sonoma State University (California), evaluation for promotion to professorship	USA	1	
Luz de-Bashan	Water Research	The Netherlands	1
	European Journal of Soil Biology	The Netherlands	5
	Journal of Applied Phycology	Australia	1
Juan-Pablo Hernandez	SEP-CONACYT-Grant proposal	Mexico	1

EXTERNAL PROJECTS (total:\$13,503,000)(1,251,000 U\$S) (10.80 pesos=1 USD).

1. Estudio de la interacción y dinámica poblacional entre microalgas y bacterias promotoras de crecimiento de microalgas utilizadas en el tratamiento de aguas residuales, utilizando herramientas moleculares.

Monto: \$100, 000.00; Financiado por CONACYT

Duración: Un años (2008-2009).

Responsable: Dra. Luz de- Bashan

2. Cellular mechanisms controlling the combined growth of microalgae and microalgae growth-promoting bacteria and their contribution to eliminate nutrients (N and P) from wastewater.

Monto: \$1,383,000.00; Financiado por CONACYT-investigacion basica

Duración: Tres años (2007-2009).

Responsable: Dr. Yoav Bashan

Participants: Dra. Luz Estela de-Bashan Dra. Esther Puente., M.Sc Juan Pablo Hernández

3. Escalamiento de una novedosa tecnologia para el tratamiento terciario de aguas residuales combinado con la recuperacion de suelos erosionados de zonas aridas, utilizando microalgas y bacterias coinmovilizadas.

Monto: \$1,800,000.00; Financiado por SEMARNAT-CONACYT

Duración: Tres años (2008-2010).

Responsable: Dr. Yoav Bashan

Participants: Dra. Luz Estela de-Bashan Dra. Esther Puente., M.Sc Juan Pablo Hernández

4. Phytostabilization of mine tailings in northwestern Mexico: The role of plant-soil-microbe interactions. Financiado por CONACYT-Investigacion Basica.

Monto: \$750,000.00

Duración: Tres años (2007-2009).

Responsable: Dra. Esther Puente.

Participants: Dr. Yoav Bashan, Dra. Luz Estela de-Bashan, MC Juan Pablo Hernández

5. Phytostabilization of mine tailings in the southwestern united states: plant-soil-microbe interactions and metal speciation dynamics

Financiado por National Institute of Environmental and Health Sciences, USA (NIH).

Monto: \$ 8,910,000 (785,000 US\$)

Duración: 5 years (2005-2010)

Responsable: Dra. Raina M. Maier (University of Arizona)

Participants: Drs., J. Chorover (University of Arizona, Tucson) and Dr. Y. Bashan (CIBNOR)

6. Growth promoting bacteria associated with arid-saline environment and their effect on reproduction on two species of mesquite trees

Financiado por Comision Forestal Nacional (CONAFOR), Mexico

Monto: \$ 560,000 (53,000 USD)

Duración: Tres años (2006-2008)

Responsable: Dr. Edgar Rueda, University of Sonora, Santa Ana

Participantes: Dr. Y. Bashan, Dra. Luz de-Bashan, Dra. E. Puente, MC. J.P. Hernandez.

Staff and collaborations in 2008

Researchers (full time)

1. Dr. Yoav Bashan
2. Dra. Esther Puente
3. Dr. Macario Bacilio

Associated researchers at the rank of technician (full time)

4. Dra. Luz Gonzalez de-Bashan
5. M.Sc Juan-Pablo Hernández
6. Biol. Mar. Patricia Vazquez
7. Biol. Mar. Bernardo Salazar
8. cM.Sc. Alicia Jimenez

Students (Research)

9. Biol. Johana Rodríguez –**Licenciatura in Biology. Graduated April 10, 2008** (The University of Tolima, Ibague, Colombia) (M.Sc. Juan-Pablo Hernandez and Dr. Yoav Bashan, Directors).
10. M.Sc. Blanca Romero - **D.Sc.** Student since 2004 (CIBNOR, La Paz, Mexico) (with Dr. Yoav Bashan and Dr. Macario Bacilio).
11. Biol. Alejandra Vovides. – **D.Sc.** Student since 2004 (Instituto de Ecologia, Xalapa, Mexico). (with Dr. Jorge Lopez-Portillo and Dr. Yoav Bashan).
12. M.Sc. Paola Magallon – **Ph.D.** student since 2007 (Laval University, Quebec, Canada). (with Dr. Hani Antoun and Dr. Yoav Bashan).
13. Biol. Octavio Perez. **M.Sc** student since 2006 (CIBNOR, La Paz, Mexico). (with Dr. Yoav Bashan)
14. Biol. Adan Trejo. **M.Sc** student since 2007 (CIBNOR, La Paz, Mexico). (with Dr. Yoav Bashan)
15. cEng. Biotechnol. Denisse Covarrubias - **Licenciatura**. Since 2006 (Technical Institute of Sonora, Ciudad Obregon, Sonora, Mexico) (with Dr. Macario Bacilio)
16. cEng. Biotechnol. Patricia Castellón - **Licenciatura**. Since 2006 (Technical Institute of Sonora, Ciudad Obregon, Sonora, Mexico) (with Dr. Macario Bacilio).
17. Biol. Sergio Hernandez - **M.Sc** student since 2008 (CIBNOR, La Paz, Mexico). (with Dr. Luz de-Bashan and Dr. Yoav Bashan)

Group's administrator

cM.Sc. Rocio Villalpando.

Foreign and national collaborations in 2008

1. Prof. Hani Antoun. Laval University, Quebec (Canada). Water Bioremediation and phosphate solubilization.
2. Prof. Raina M. Maier, and M.Sc. Julie Nielsen, University of Arizona (USA). Phytostabilization of mine tailings.
3. Dr. Humberto Suzan. University of Queretaro (Mexico). Mesquite enzymology and ecology.

4. Dr. Guadalupe Malda. University of Queretaro (Mexico). Conservation of rare cacti.
5. Prof. Jimena Sanchez, National University of Colombia, Bogota (Colombia). The use of inoculants for plant growth promoting bacteria.
6. Dr. S.R. Prabhu, International Bio Recovery Corporation (Canada). Inoculant information from India.
7. Prof. Zvi Ha-Cohen, University of Ben Gurion in the Negev (Israel). Fatty acids from microalgae.
8. Dr. Horst Vierheilig. Superior council of research (Spain). Mycorrhizae of desert plants.
9. Dr. Bernard Bormann, USDA – Forest Service, Corvallis Oregon, (USA)- Rock weathering by plants.
10. Dr. Drora Kaplan. University of Ben Gurion in the Negev (Israel). Re-use of water in arid zone.
11. Dr. Robert Linderman- Plant Health Inc. Private sector, Corvallis, Oregon (USA). Reforestation of desert eroded lands.
12. Dr. C.Y. Li. USDA-Forest service (retired). Rock weathering by plants.
13. Dr. Gabor Bethlenfalvay- USDA-ARS (retired). Reforestation of desert eroded lands.
14. Dr. Jorge Lopez-Portillo and Dr. Roger Guevara, Institute of Ecology, Xalapa (Mexico). Nitrogen fixation in mangroves.
15. Prof. Anton Hartmann and Dr. Michael Schmid. German Research Center for Environmental Health, München, (Germany). FISH analysis of plant-bacteria interactions.