

The Group of "Environmental Microbiology"- CIBNOR

Final productivity 2004

(Numbers in parenthesis near journal's name are the **scientific impact, 2003**)
(Codes refer to the strategic project responsible for the publication)

Summary

- Original publications in peer-reviewed, scientific <u>international</u> journals.	
Published and "in press" -	8
- Publication in national journal	1
- Submitted papers -	7
- Publications in books -	4
- Publications in newspapers	2
- Abstracts in conferences	13
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- Total productivity (without abstracts) for 2004	22

- **Average "Impact Factor" of all published and "in press" papers: 1.524**

PUBLISHED AND "IN PRESS" PUBLICATIONS

Publications in scientific international reviewed journals

1. 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 (PC 5.2) (1.822).
2. Bacilio M., Rodriguez H., Moreno M., Hernandez J.-P., and Bashan Y. 2004. Mitigation of salt stress in wheat seedlings by a *gfp*-tagged *Azospirillum lipoferum*. **Biology and Fertility of Soils 40**: 188-193 (PC 5.2) (1.152)
3. 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 (PC 5.2) (1.094).
4. Puente, M.E., Bashan, Y., Li, C.Y., and Lebsky, V.K. 2004. Microbial populations and activities in the rhizoplane of rock-weathering desert plants, I. Root colonization and weathering of igneous rocks. **Plant Biology 6**: 629-642 (1.420) (PC 5.2)
5. Puente, M.E., Li, C.Y., and Bashan, Y. 2004. Microbial populations and activities in the rhizoplane of rock-weathering desert plants, II. Growth promotion of cactus seedlings. **Plant Biology 6**: 643-650 (1.420) (PC 5.2)

6. 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 (1.812) (PC 5.2)
7. Rodriguez, H., Gonzalez, T., Goire, I., and Bashan, Y. 2004. Gluconic acid production and phosphate solubilization by the plant growth-promoting bacterium *Azospirillum* spp. **Naturwissenschaften** **91**: 552-555 (1.883) (PC 5.2)
8. Rodriguez, H., Fraga, R., Gonzalez, T., and Bashan, Y. 2004. Genetics of phosphate solubilization and its potential application for improving plant growth-promoting bacteria. **Plant and Soil** (in Press) (PC 5.2) (1.594).

PUBLICATIONS IN A REVIEWED INTERNATIONAL BOOK

9. Bashan, Y. and de-Bashan, L.E. 2005. Bacteria / Plant growth-promotion. In: **Encyclopedia of soils in the environment**. (Editor-in-Chief) D. Hillel, Elsevier, Oxford, U.K. Vol. 1. (in press). (PC 5.2)

PUBLICATIONS IN INTERNATIONAL BOOKS

10. de-Bashan L.E. and Bashan Y. 2004. Fertilizer potential of phosphorus recovered from wastewater treatments. In: **Microbial phosphate solubilization**. Edited by E. Velázquez-Pérez and C. Rodríguez-Barrueco, Kluwer Academic Publishers, Dordrecht, The Netherlands (In press). (PC 5.2).
11. Rodriguez, H., Fraga, R., Gonzalez, T., and Bashan, Y. 2004. Genetic modifications of phosphate solubilizing bacteria to be used as agricultural inoculants. In: **Microbial phosphate solubilization**. Edited by E. Velázquez-Pérez and C. Rodríguez-Barrueco, Kluwer Academic Publishers, Dordrecht, The Netherlands (In press). (PC 5.2)
12. Whitmore, R.C., Brusca R.C., González-Zamorano, P., Mendoza-Salgado R., Amador-Silva E.S., Holguin G., Mclvor C.C. 2004. The Ecological importance of mangrove ecosystems in Baja California Sur. In: **Biodiversity, ecosystems, and conservation in northern Mexico**. Cartron, J.-C. and Ceballos, G. (editors), Oxford University Press. (PC 3.2)

PUBLICATION IN A NATIONAL JOURNAL

13. Bashan, Y., and de-Bashan, L.E. 2004. The biggest of all; the giant cardon cactus of Baja California, Mexico. **Tzabar 11**: 18-25 (Hebrew) (Cacti and succulents society of Israel) (PC 5.2)

PUBLICATION IN NEWSPAPERS

14. Holguin, G., Patterson, P. 2004. Los daños causados por los campos de Golf. *El Peninsular*. 29.11.2004.
15. Holguin, G. 2004. ¿Si Brazil puede, por qué nosotros no? *El sudcaliforniano*. 05.09.2004.

SUBMITTED PUBLICATIONS

PUBLICATIONS IN SCIENTIFIC INTERNATIONAL REVIEWED JOURNALS

1. de-Bashan, L.E., Antoun, H., and Bashan, Y. 2004. Population size controls nitrogen uptake by the microalga *Chlorella* spp. when interacting with the microalga growth-promoting bacterium *Azospirillum brasilense*. **FEMS Microbiology Ecology** (2.915) (PC 5.2)
2. Bashan, Y. and de-Bashan, L.E. 2004. Fresh-weights of roots provide inaccurate estimates of the effects of plant growth-promoting bacteria on root growth: a critical examination. **Soil Biology and Biochemistry** (1.915) (PC 5.2)
3. Puente, M.E., Li, C.Y., and Bashan, Y. 2004. Rock-degrading bacterial endophytes in cactus. **Science** (30.979)(Washington DC) (PC 5.2)
4. Bashan, Y., Bustillos J. J., Leyva, L. A., Hernandez J.-P., and Bacilio M., 2004. Increase in photosynthetic pigments in wheat seedlings induced by *Azospirillum brasilense*. **Biology and Fertility of Soils** (1.151) (PC 5.2)
5. Hernandez, J.-P., de-Bashan, L. E. and Bashan Y. 2004. Starvation enhances phosphorus removal from wastewater by the microalga *Chlorella* spp. co-immobilized with *Azospirillum brasilense*. **Enzyme and Microbial Technology** (1.501) (PC 5.2)
6. Gonzalez-Acosta, B., Bashan, Y., Hernandez-Saavedra N. Y., Ascencio F., and De la Cruz-Agüero, G. 2004. Seasonal seawater temperature as the major determinant for populations of culturable bacteria in the sediment of intact semi-arid mangroves. **FEMS Microbiology Ecology** (2.947)(PC 5.2)

7. Holguin, G., Gonzalez-Zamorano P., de-Bashan L.E., Mendoza, R., Amador E. and Bashan Y. 2004. Biological and physicochemical indicators in healthy arid mangroves facing urban development encroachment to establish 'natural' baselines for management - a case study. **The Science of the Total Environment** (1.455) (PC 5.2 and PC 3.2)

PRESENTATIONS IN CONFERENCES

1. Bacilio, M., Holguin, G. and Romero, B. 2004. Plant growth promoting bacteria from the roots of semi-desert papaya plants. XXII Reunião Latinoamericana de Rizobiologia & I Reunião Nacional de Fixação Biológica de Nitrogênio. 13 a 15 de Setembro de 2004 cidade do Rio de Janeiro, Brasil. **(presentación de poster)**
2. Davila-Lule, A., Flores-Mireles, A., Villicaña, C., Ruiz, M.A., Eberhard, A., Gronquist, M., Carrillo, A., Vazquez, P., Holguin, G. 2004. Synthesis of acyl-homoserine lactones by plant growth promoting bacteria isolated from roots of mangroves from Bahia de Balandra, Baja California Sur, México. Congreso de Rhizobiologia. 12-15 Septiembre 2004, Ciudad Pesqueira, Brasil, **(presentación de poster)**
3. Holguin, G. 2004. Especies endémicas: mírame y no me toques!. PACE, Programa de Acercamiento de la Ciencia a la Educación, Actividades de Verano, La Ciencia es para Todos! 10.08.2004. Universidad Pedagógica, La Paz, BCS
4. Bashan, Y. 2004. Desert reforestation in northwest Mexico. The desert research institute. Ben Gurion University of the Negev, September 23, 2004, Sde Boqer, Israel. **(invited Lecture)**
5. Bashan, Y. 2004. Plant growth promoting bacteria with special emphasis on desert reforestation. Jornada académico-culturales 2004. Unidad regional norte, campus Santa Ana, División de ciencias administrativas, contables y agropecuarias. Universidad de Sonora, October 11-15, 2004. Santa Ana, Sonora, **(Conferencia magistral)**
6. de-Bashan, L.E. 2004. Inmovilización de microorganismos para propósitos ambientales. Jornada académico-culturales 2004. Unidad regional norte, campus Santa Ana, División de ciencias administrativas, contables y agropecuarias. Universidad de Sonora, October 11-15, 2004. Santa Ana, Sonora **(Conferencia magistral)**.
7. Bashan, Y., Puente, M.E., Li, C.Y., Bethlenfalvay, G., Moreno M., Bacilio, M., Rojas, C., and Salazar B. 2004. El uso de plantas nativas del desierto inoculadas con bacterias promotoras de crecimiento en plantas, micorriza y

composta para reforestación del desierto y prevención de erosión del suelo. 16th Congreso Mexicano de Botánica, Octubre 17-22, 2004, Oaxaca, Mexico **(Invited lecture)**. p. 49.

8. Holguin, G. 2004. Comunicación molecular entre las bacterias de la rizosfera y los mangles: reforestacion. Semana Biotecnológica del Instituto Tecnológico de Sonora. 25.10.2004. Ciudad Obregon, Sonora. **(Invited lecture)**
9. Bashan, Y. 2004. Recuperacion de areas degradadas utilizando microorganismos beneficos. Conference on the use of beneficial microorganisms, Escuela de Geociencias, Facultad de Ciencias, Universidad Nacional de Colombia, November 1-2, 2004. Medellin, Colombia **(Conferencia magistral)**.
10. de-Bashan, L.E. 2004. Biorremediacion de aguas utilizando microorganismos beneficos. Conference on the use of beneficial microorganisms, Escuela de Geociencias, Facultad de Ciencias, Universidad Nacional de Colombia, November 1-2, 2004. Medellin, Colombia **(Conferencia magistral)**.
11. Bashan, Y. Puente M.E. and Li, C.Y. 2004. Soil formation, and growth promotion of cacti inoculated with rock-weathering, plant growth-promoting bacteria. 32nd National Congress of Soil Science. November 8-10, 2004, Leon, Guanajuato, Mexico **(Invited lecture)**.
12. Bashan, Y. 2004. Plant-microorganisms-environment interactions, a complex sustaining the planet. Gaia's cycle of conferences. Autonomous University of Baja California Sur, November 22-23, 2004. La Paz, Mexico **(Invited lecture)**.
13. Bashan, Y., de-Bashan, L.E., Hernandez, J.-P., Yabur, R., Puente M. E., Bacilio, M. and Leyva, L.A. 2004. Synthetic microbial inoculants; are they the future? In: Symposium on Biofertilizers, INIFAP and the Center for Genomic Biotechnology, Nacional polytechnique Institute, 24 -25.11.2004. Reynosa and Rio Bravo, Tamaulipas, Mexico **(Conferencia magistral)**.

COMMUNITY SERVICES

1. **Papaya's strategic internal project** of CIB (Dra. Holguin and Dr. Bacilio)
2. **Ecological restoration strategic internal project** of CIB (Dr. Bashan and Dra. Puente)
3. **Restoration of the mangroves of Punta de Mogote**. Re-opening, stabilizing the feeding channel and planting a hurricane-destroyed mangroves in collaboration with SEMARNAT and PROFEPA financed by: "Praiso del Mar" Co. and the program of Restorcaion Ambiental at CIB. The system was restored and function. (Dr. Bashan, Dra. Holguin). (PC 5.2 and PC 3.2)
4. **Reforestation of 1500 m² of eroded land in Reserva de El Comitan** by planting 1500 native trees of 4 species treated with beneficial

microorganisms and compost. Reforestation completed. Financed by SEP-CONACYT (Dr. Bashan, Dra. Puente, Dr. Bacilio, MC Moreno, and MC Rojas). (PC 5.2)

5. **Participación en un foro para concientización ambiental de los ciudadanos de La Paz.** Titulo de plática: Los manglares, sirven para algo? 07.11.2004 (Dra. Gina Holguin).

EXTERNAL PROJECTS (total:\$ 6,082.000.00)

1. Desarrollo de una novel estrategia combinada para el biotratamiento de agua residual y la recuperación de suelos erosionados utilizando bacterias promotoras de crecimiento de microalgas (MGPB) y microalgas coinmovilizadas juntas en polimeros.

Financiado por CONACYT-SEMARNAT

Monto: \$ 1'859.900.00

Duración: Tres años (2003-2006)

Participantes: Dr. Yoav Bashan, MC. Luz Estela González, cMC Juan Pablo Hernández

2. Reforestación del desierto: el rol de los microorganismos del suelo y roca, y de las islas de recursos, en el establecimiento de plantas para la restauración de áreas perturbadas.

Financiado por SEP-CONACYT

Monto: \$ 1'513.591.00

Duración: Tres años (2003-2006)

Participantes: Dr. Yoav Bashan, Dr. Macario Bacilio, Dra M. Esther Puente, MC Claudia Rojas, MC. Manuel Moreno

3. Estudio de la codependencia y comunicacion entre miembros de la comunidad bacteriana de la rizosfera y arboles de mangle para el diseño de inoculantes mixtos que promuevan el crecimiento de plantas

Financiado por SEP-CONACYT

Monto: \$ 1'555.266.00

Duración: Tres años (2003-2006)

Responsable: Dra. Gina Holguin Zehfuss

Participantes: Dr. Yoav Bashan, Dr. Macario Bacilio, Biol. Mar. Patricia Vazquez Correa, Dr. Stephen Winans (USA), Dr. Anatol Eberhard (USA), Dr. Jaime Polanía (Colombia).

4. Estudio de la mitigacion del estrés salino en plantas de chile utilizando composta y bacterias promotoras del crecimiento vegetal.

Financiado por SEP-CONACYT

Monto: \$ 861,000.00

Duración: Tres años (2004-2007)

Participantes: Dr. Macario Bacilio Jiménez (Responsable), Dra. Gina Holguín Zehffus, Juan A Larrinaga Mayoral, Hector J. García Monarrez (UABCS).

5. Obtencion, caracterizacion y evaluacion de nuevas cepas de bacterias promotoras del crecimiento de las plantas para su empleo como inoculantes en la agricultura.

Financiado por Mexico- Cuba-CONACYT

Monto: \$ 10,725.00

Duración: Tres años (2004-2006)

Responsable: Dr. Yoav Bashan

Participantes: Dra. Hilda Rodríguez (Cuba), Dra. Gina Holguin

PRESENTATION OF AN INTERNATIONAL COURSE

Mecanismos de depuración de aguas residuales en humedales naturales y construidos. Cooperation of CYTED (Red Iberoamericana de Ciencia y Tecnología en Desarrollo), Mexico, and Pontificia Universidad Javeriana, Bogota, Colombia. October 25-30, 2004. Bogota, Colombia. (Dr. Yoav Bashan and cDr. Luz E. Gonzalez de-Bashan).

Staff and collaborations in 2004

Researchers

Dr. Yoav Bashan

Dra. Esther Puente

Dr. Macario Bacilio

Dra. Gina Holguin

Students

1. IBQ Esther Puente- D.Sc. 1999-2004 (Graduated May 2004) (CIB)
2. M.Sc. Luz Gonzalez de-Bashan - Ph.D. Student since 2001 (Laval University, Canada)
3. M.Sc. Ricardo Yabur - D.Sc. Student since 2001 (CICIMAR)
4. M.Sc. Barbara Gonzalez - D.Sc. Student since 2001(CIB)
5. Biol. Juan-Pablo Hernández- M.Sc student since 2002 (CICIMAR)
6. Biol. Ana Flores – M.Sc student since 2003. (CIB)
7. Eng. Luis Leyva - M.Sc student since 2003. (CIB)
8. Pasante Manuel A. Rodríguez – Licenciatura Student since 2004 (UABCS)
9. Biol. Alfonso Davila- M.Sc student since 2004. (CIB)
10. Biol. Claudia Villicana – M.Sc student since 2004. (CIB)
11. M.Sc. Blanca Romero - D.Sc. Student since 2004 (CIB)
12. cBiol. Elsa Samano. Scientific summer of the Mexican Academy (ITSON).
13. cBiol. Diana Arizmendi. Scientific summer of the Mexican Academy (UAM).
14. cBiol. Tania Melgoza. Scientific summer of the Mexican Academy (ITSON).
15. cBiol. Ana Soto. Scientific summer of the Mexican Academy (UA Nayarit)
16. Biol. Mar. Yossef Lopez. Servicio Social (UABCS).

17. cEng. Silke Fendrich. Civil Engineering student since 2001 (Tech. Univ. Hamburg, Germany)
18. Biol. Marcela Casillas. (Escuela Nacional de Ciencias Biologicas, IPN). Technical training for M.Sc.

Associated researchers at the rank of technician

1. Biol. Mar. Patricia Vazquez
2. M.Sc. Manuel Moreno (until September 2004)
3. cDr. Luz Gonzalez de-Bashan
4. cM.Sc Juan-Pablo Hernández
5. M.Sc. Claudia Rojas (until November 2004)

Group's administrator

cBio. Mar. Bernardo Salazar

Local Collaborations in 2004 at CIB

1. Dr. Jose J. Bustillos- Pigments in inoculated plants and microalgae
2. Dr. Fernando García-Carreño – Enzymology and Biochemistry.
3. Ann Navarrete-Del-Toro – Enzymology
4. M.Sc- Edgar Amador –Ornithology
5. M.Sc-Renato Mendoza- Ornithology.

Foreign collaborations in 2004

1. Dr. C.Y. Li, USDA – Forest Service, Corvallis Oregon, (USA)- Rock weathering by plants.
2. Dr. R.G. Linderman, USDA - ARS, Corvallis Oregon, (USA)- Use of mycorrhizae for desert vegetation.
3. Ing. B. Liao, Ing. H. Kang, cDr. Li and Dr. X. Ping, Tropical Forestry Research Institute, Goangzhou, PRC (China and Switzerland). Inoculation of mangroves with plant growth promoting bacteria.
4. Prof. Hani Antoun. Laval University, Quebec (Canada). Water Bioremediation.
5. Prof. Raina M. Maier, University of Arizona (USA). Desert re-vegetation-proposal.
6. Dr. Anatol Eberhard, Cornell University (USA). Homoserine lactone bacterium-bacterium recognition molecules.
7. Dr. Stephen Winans, Cornell University (USA). Homoserine lactone bacterium-bacterium recognition molecules.
8. Dr. Peter Felker. D'Arrigo Bros. Co. California (USA). Mesquite cultivation.
9. Dr. Hilda Rodriguez, University of Waterloo, (Canada), and Cuban Institute for Sugar By-Products, (Cuba), Molecular genetics of *Azospirillum*.
10. Dr. Jaime Polanía, National University of Colombia at St. Andres (Colombia). Inoculation of mangrove seedlings with beneficial bacteria.
11. Prof. Jimena Sanchez, National University of Colombia, Bogota (Colombia). The use of plant growth promoting bacteria.

12. Dr. Volker Huss, University of Erlangen (Germany). Identification of Microalgae.
13. Dr. S. Prabhu, International Bio Recovery Corporation (Canada). Inoculant information from India.
14. Prof. Zvi Ha-Cohen (Israel). Fatty acids from microalgae.