

The Group "Environmental Microbiology"- CIB

Productivity in 2000

(Numbers in parenthesis near journal's name are the scientific impact, 1999)(Codes refer to the financing project)

Summary

- Original publications in peer reviewed, scientific <u>international</u> journals.	
Published and "in press" -	18
- Original publications in peer reviewed, scientific <u>national</u> journals.	
Published and "in press" -	4
Submitted papers -	7
- Publications in books (regular and conference)-	14
- Scientific publications in the Internet	2
- Publications in National Newspapers	2
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- Total productivity for 2000	47

- Average "Impact Factor" of all published and "in press" papers: 1.46

PUBLISHED AND "IN PRESS" PUBLICATIONS

Publications in scientific international reviewed journals

1. Bashan, Y., Gonzalez, L.E., Toledo, G., Leon de La Luz, J.L., Bethlenfalvay, G.J., Troyo, E., Rojas, A., Holguin, G., Puente, M.E., Lebsky, V.K., Vazquez, P., Castellanos, T. and Glazier, E. 2000. A proposal for conservation of exemplary stands of the giant cardon cactus (*Pachycereus pringlei* [S. Wats Britt. & Ross]) in Baja California Sur, Mexico. **Natural Areas Journal** **20**: 197-200 (0.736). AYCG 1
2. Bashan, Y., Davis, E. A., Carrillo, A. and Linderman, R.G. 2000. Assessment of VA mycorrhizal nodule potential in relation to the establishment of cactus seedlings under mesquite nurse-trees in the Sonoran desert. **Applied Soil Ecology** **14**:165-176.(1.0) BIVE 1
3. Gonzalez, L.E., and Bashan, Y. 2000. Increased growth of the microalga *Chlorella vulgaris* when coimmobilized and cocultured in alginate beads with the plant growth-promoting bacterium *Azospirillum brasilense*. **Applied and Environmental Microbiology**. **66**: 1527-1531 (3.541) AYCG

4. Carrillo-Garcia, A., Bashan, Y. and Bethlenfalvay, G.J. 2000. Resource-island soils and the survival of the giant cactus, cardon, of Baja California Sur. **Plant and Soil 218**: 207-214 (1.281) BIVE 1
5. Carrillo-Garcia, A., Bashan, Y., Diaz-Rivera, E., and Bethlenfalvay, G.J. 2000. Effects of resource - island soils, competition, and inoculation with *Azospirillum* on survival and growth of *Pachycereus pringlei*, the giant cactus of the Sonoran Desert. **Restoration Ecology 8**: 65-73 (1.236) BIVE 1
6. Bashan, Y. and Vazquez, P. 2000. Effect of calcium carbonate, sand, and organic matter levels on mortality of five species of *Azospirillum* in natural and artificial bulk soils. **Biology and Fertility of Soils 30**: 450-459 (1.27) BIVE 1
7. Vazquez, P., Holguin, G., Puente, M.E., Lopez-Cortes, A. and Bashan, Y. 2000. Phosphate-solubilizing microorganisms associated with the rhizosphere of mangroves growing in a semiarid coastal lagoon. **Biology and Fertility of Soils 30**: 460-468 (1.27) AYCG 1
8. Morzhina E.V., Tsyganov V.E., Borisov A.Y., Lebsky V.K., and Tikhonovich I.A. 2000. Four development stages identified by genetic dissection of pea (*P. sativum* L.) roots nodule morphogenesis. **Plant Science 155**: 75-83. (1.015) RT-1
9. Gonzalez-Bashan, L.E., Lebsky, V.K., Hernandez, J.P., Bustillos, J.J. and Bashan, Y. 2000. The metabolism of the microalga *Chlorella vulgaris* is affected by its natural associative bacterium *Phyllobacterium myrsinacearum* when coimmobilized in alginate beads. **Canadian Journal of Microbiology 46**: 653-659 (1.072) AYCG 1
10. Castellanos, T., Ascencio, F. and Bashan, Y. 2000. Starvation-induced changes in the cell-surface of *Azospirillum lipoferum*. **FEMS Microbiology Ecology 33**:1-9 (2.405). BIVE 1
11. Bashan, Y., Moreno, M., and Troyo, E. 2000. Growth promotion of the oilseed halophyte *Salicornia bigelovii* in seawater inoculated with mangrove rhizosphere bacteria and *Azospirillum* . **Biology and Fertility of Soils 32**: 265-272 (1.27) BIVE 1
12. Holguin, G, and Glick B.R. 2000. Expression of the ACC deaminase gene from *Enterobacter cloacae* UW4 in *Azospirillum brasilense*. **Microbial Ecology** (In press)(2.19) BIVE 1

13. Bacilio-Jimenez, M., Aguilar-Flores, S., Velazquez del Valle, M., Perez, A., Zepeda, A., and Zenteno, E. 2000. Endophytic bacteria in rice seeds inhibit early colonization of roots by *Azospirillum brasilense*. **Soil Biology and Biochemistry** (in press) (1.49) AGEC-1.
14. Holguin, G. Vazquez, P., and Bashan, Y. 2000. The role of sediment microorganisms in the productivity, conservation, and rehabilitation of mangrove ecosystems : AN OVERVIEW . **Biology and Fertility of Soils** (In press).(1.27) AYCG 1
15. Lebsky, V.K., Gonzalez-Bashan, L.E., 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. **Canadian Journal of Microbiology** (in press)(1.072) AYCG 1
16. Ortíz, B., Bacilio, M., Gorocica, P., Montaña, L.F., Garfias, Y., and Zenteno, E. 2000. The hydrophobic character of peanut (*Arachis hipogea*) isoagglutinins. **Journal of Agricultural and Food Chemistry** (1.453)(In press).
17. Toledo, G., Rojas, A., and Bashan, Y. 2000. Monitoring of black mangrove restoration with nursery-reared seedlings on an arid coastal lagoon. **Hydrobiologia** (In press)(0.706)(AYCG 1)
18. Rojas, A., Holguin, G., Glick, B.R. and Bashan, Y. 2000. Synergism between *Phyllobacterium* sp. (N₂-fixer) and *Bacillus licheniformis* (P-solubilizer), both from a semiarid mangrove rhizosphere. **FEMS Microbiology Ecology** (2.405)(AYCG 1) (In press)

PUBLICATIONS IN NATIONAL REVIEWED JOURNALS

19. Bashan, Y., Toledo, G., Gonzalez, L.E. and Holguin, G. 2000. La caída de los gigantes: un análisis del decaimiento del carbono (*Pachycereus pringlei*) en Baja California Sur. **Ciencia y Desarrollo** 26 (no. 150): 30-37. AYCG 1
20. Strangmann, A., Noormann, M., Bashan, Y. and Giani, L. 2000. Methane dynamics in natural and disturbed mangrove soils (tropical salt marshes) in Baja California Sur, Mexico. **Mitteilungen der Deutschen Bodenkundlichen Gesellschaft** 91: 1549-1552. AYCG 1
21. Bashan, Y. 2000. Publication in high impact international journals, does it matter in Mexico? **Ciencia y Desarrollo** (in Spanish). AYCG 1 (In press).

22. Bashan, Y., Gonzalez-Bashan, L.E., and Leon de la Luz, J.L. 2000. Is the "king cactus" of Baja California deserts, the giant cardon, under siege? **Wildflower**. AYCG 1 (In press).

PUBLICATIONS IN NATIONAL BOOKS

23. Gonzalez, L.E., Holguin, G., Glick, B.R., and Bashan, Y. 2000. Plant growth-promoting bacteria for agriculture and the environment. In: **Agricultural Microbiology for the 21th century**. (Ed). R. Ferrera-Cerrato and A. Alarcon. Published by Mundi Prensa, Mexico. (in press) BIVE 1
24. Holguin, G., and Bashan, Y. 2000. Mangroves: microbiology and economical importance. In: **Agricultural Microbiology for the 21th century**. (Ed). R. Ferrera-Cerrato and A. alarcon. Published by Mundi Prensa, Mexico.(in press) AYCG 1

PUBLICATION IN CONFERENCE'S BOOKS

25. 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. AYCG-1
26. Tikhonovich, I.A., B.Boesten, A.Y. Borisov, J.M. Jacobi, A.S.Kukalev, V.K. Lebsky, E.V. Morzhina, J. Olivares, N.E. Petrova, U.B. Priefer, V.L. Romanov, J. Sanjuan, J.M. Sanjuan-Pinilla, A.F. Topunov, V.E.Tcyganov, V.A.Voroshilova. 2000. Plant genes controlling development of two pea (*Pisum sativum* L.) endosymbiotic systems. 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. 311-312. RT-1
27. Bashan, Y., Bashan L.E., Moreno, M., Puente, M.E., Rojas, A., Bethlenfalvay, G.J., Carrillo, A., Holguin G., Vazquez P., and Glick B.R. 2000. Environmental applications of plant growth-promoting bacteria of the genus *Azospirillum*. In **Proceedings of the 10th International Conference on Plant Pathogenic Bacteria**. (Eds.) S.D. De Boer. International Society of Plant Pathology, Canada (In press). AYCG-1
28. Bashan, Y. 2000. Reduction in disease severity of *Pseudomonas syringae* pv. *tomato* in tomatoes by *Azospirillum brasilense* inoculation combined with partial application of bactericides. In **Proceedings of the 10th**

- International Conference on Plant Pathogenic Bacteria.** (Eds.) S.D. De Boer. International Society of Plant Pathology, Canada (In press). BIVE-1
29. Bashan, Y. 2000. The tomato rhizosphere supports better the survival of the plant growth-promoting bacterium *Azospirillum brasilense* than its pathogen *Pseudomonas syringae* pv. *tomato*. In **Proceedings of the 10th International Conference on Plant Pathogenic Bacteria.** (Eds.) S.D. De Boer. International Society of Plant Pathology, Canada (In press). BIVE-1
 30. Bashan, Y. 2000. Environmental application for *Azospirillum* sp. In: **Proceedings of the 5th International plant growth-promoting rhizobacteria conference.** Auburn University Web Site. Available <http://www.ag.auburn.edu/argentina/pdfmanuscripts/bashan.5pdf> (AYCG-1)
 31. Gonzalez-Bashan, L.E., Hernandez, J.P., Lebsky, V.K., Moreno, M. and Bashan, Y. 2000. Improved growth and water bioremediation capacity of the microalga *Chlorella vulgaris* when coimmobilized in alginate beads with the plant growth-promoting bacterium *Azospirillum brasilense*. In: **Proceedings of the 5th International plant growth-promoting rhizobacteria conference.** Auburn University Web Site. Available: <http://www.ag.auburn.edu/argentina/pdfmanuscripts/bashan3.pdf> (AYCG-1)
 32. Bashan, Y., Moreno, M., Puente, M.E., Holguin, G., Vazquez, P., Troyo, E., and Glick, B.R. 2000. Inoculation of marine plants with marine plant growth-promoting bacteria and halotolerant *Azospirillum* - a novel approach of employing PGPBs for environmental use and seawater agriculture. In: **Proceedings of the 5th International plant growth-promoting rhizobacteria conference.** Auburn University Web Site. Available: <http://www.ag.auburn.edu/argentina/pdfmanuscripts/bashan4.pdf> (BIVE-1)
 33. Bashan, Y., Carrillo, A.E., Bethlenfalvay, G.J., Rojas, A. and Puente, M.E. 2000. Prevention of desert soil erosion and enhancing soil stabilization by mycorrhizal fungi and by cactus plants inoculated with *Azospirillum brasilense*. In: **Proceedings of the 5th International plant growth-promoting rhizobacteria conference.** Auburn University Web Site. Available: <http://www.ag.auburn.edu/argentina/pdfmanuscripts/bashan2.pdf> (BIVE-1)
 34. Rojas, A., Holguin, G., Bashan, Y. and Glick, B.R. 2000. Mutualism between *Phyllobacterium* sp. (N₂ fixer) and *Bacillus licheniformis* (P-solubilizer) from semiarid mangrove rhizosphere. In: **Proceedings of the 5th International plant growth-promoting rhizobacteria conference.** Auburn University Web Site. Available: <http://www.ag.auburn.edu/argentina/pdfmanuscripts/rojas.pdf> (AYCG-1)

35. Holguin, G., Glick, B.R. 2000. Inoculation of tomato plants with *Azospirillum brasilense* transformed with the ACC deaminase gene from *Enterobacter cloacae* UW4. In: **Proceedings of the 5th International plant growth-promoting rhizobacteria conference**. Auburn University Web Site. Available: <http://www.ag.auburn.edu/argentina/pdfmanuscripts/holguin.pdf> (AYCG-1)
36. Holguin, G., Glick, B.R. 2000. improving the plant growth promoting ability of *Azospirillum brasilense* by genetic manipulation. In: **Proceedings of the 5th International plant growth-promoting rhizobacteria conference**. Auburn University Web Site. Available: <http://www.ag.auburn.edu/argentina/pdfmanuscripts/holguin2.pdf> (AYCG-1)

PUBLICATIONS IN THE INTERNET

37. Bashan, Y. and Miller, L. 2000. Conservation of exceptional stands of the giant cardon cactus in Baja California Sur, Mexico. At: <http://www.cibnor.org/conserv/cardon/icardon.html>
38. Bashan, Y. and Miller, L. 2000. Conservation of arid mangrove ecosystems in Baja California Sur, Mexico. At: <http://www.cibnor.org/conserv/mangrove/imang.html>

PUBLICATIONS IN A NATIONAL NEWSPAPER

39. Holguin, G. 2000. A "complete" map of the human genome. **La Jornada**, Mexico City, April 17. AYCG-1
40. Bashan, Y., and Holguin, G. 2000. Serios problemas enfrenta en Baja California Sur el Cardon o cactus gigante. **La Jornada**, Mexico City, (accepted) AYCG-1

SUBMITTED PUBLICATIONS

PUBLICATIONS IN SCIENTIFIC INTERNATIONAL REVIEWED JOURNALS

1. Bashan, Y., Li, C.Y., Moreno, M., Lebsky, V.K. and Gonzalez-Bashan, L.E. 2000. Lava-rocks-weathering plants from arid Baja California, Mexico. **Proceedings of the Natural Academy of Science USA** (10.26)
2. Puente, M.E., Bashan, Y., Li, C.Y., Moreno, M., Soeldner, A., and Lebsky, V.K. 2000. Microbial population of the rhizoplane of arid, lava-rocks-weathering cacti. **Proceedings of the Natural Academy of Science USA** (10.26)

3. Bashan, Y. and Gonzalez-Bashan, L.E. 2000. Root dry-weight vs. root fresh weight when evaluating the effect of plant growth-promoting bacteria on plants. **Journal of Applied Microbiology** (1.521)
4. Valderrama, L.T., Del Campo, C.M., Rodriguez, C.M., Gonzalez-Bashan, L.E., and Bashan, Y. 2000. Consecutive wastewater treatments using the microalga (*Chlorella vulgaris*) and the macrophyte (*Lemna valdiviana*) for ethanol and citric acid production effluents. **Water Research** (1.748)
5. Gonzalez-Bashan, L.E., Bashan, Y., Moreno, M., Lebsky, V.K., and Bustillos, J.J. 2000. Lipid and pigment content, ammonium absorption, and cell size of the microalgae *Chlorella* spp. increased when coimmobilized in alginate beads with *Azospirillum brasilense*. **Applied and Environmental Microbiology** (3.541)
6. Gonzalez-Bashan, L.E., Moreno, M. Hernandez, J.-P., and Bashan, Y. 2000. Ammonium and phosphorus removal from continuous and semi-continuous cultures by the microalgae *Chlorella vulgaris* coimmobilized in alginate beads with *Azospirillum brasilense*. **Biotechnology and bioengineering** (2.115)
7. Bacilio-Jiménez, M., Aguilar-Flores, S., Ventura-Zapata, E. and Zenteno E. 2000. Chemical characterization of radical exudates from rice (*Oryza sativa*) and their effect on the chemotactic capacity of endophytic bacteria and two root and soil plant growth-promoting bacteria (*Azospirillum* and *Bacillus* spp.). **Soil Biology and Biochemistry** (1.49)

ABSTRACTS IN CONFERENCES

1. Holguin, G., and Glick, B.R. 2000. Improving the plant-growth promoting ability of *Azospirillum brasilense* by genetic manipulation. Annual Graduate Symposium, Dept. of Biology, University of Waterloo. April 6.
2. Gonzalez, L.E. and Bashan, Y. 2000. Environmental applications of plant growth-promoting bacteria. 10th International Conference on Plant Pathogenic Bacteria. 23-27.7.2000. Charlottetown, Canada. S-14. **(Key note lecture and session chairman)**
3. Bashan, Y. 2000. Reduction in disease severity of *Pseudomonas syringae* pv. *tomato* in tomatoes by *Azospirillum brasilense* inoculation combined with partial application of bactericides. 10th International Conference on Plant Pathogenic Bacteria. 23-27.7.2000. Charlottetown, Canada. O-26.
4. Bashan, Y. 2000. The tomato rhizosphere supports better the survival of the plant growth-promoting bacterium *Azospirillum brasilense* than its pathogen *Pseudomonas syringae* pv. *tomato*. 10th International Conference on Plant Pathogenic Bacteria. 23-27.7.2000. Charlottetown, Canada. O-27.

5. Carcaño-Montiel, M.G., Almaraz-Suarez. J.J., Ferrera-Cerrato, R., Molina-Galan, J., and Bashan, Y. 2000. Isolation and evaluation of the diazotrophs *Azospirillum* sp., and *Klebsiela* sp. as growth promoters of maize plant (*Zea mays* L.). 30st National soil Congress, 25-29. 9. 2000, Veracruz, Mexico.
6. Bashan, Y. and Bashan, L.E. 2000. Environmental applications of *Azospirillum* Sp. 5th International plant growth-promoting rhizobacteria conference. Villa Carlos Paz, Argentina 29.10-3.11. 2000 (**Invited lecture and session chairman**). pp. 53-57.
7. Bashan, L.E., Hernandez, J.P., Lebsky, V.K., Moreno, M. and Bashan, Y. 2000. Improved growth and water bioremediation capacity of the microalgae *Chlorella vulgaris* when coimmobilized in alginate beads with the plant growth promoting bacteria *Azospirillum brasilense*. 5th International plant growth-promoting rhizobacteria workshop. Villa Carlos Paz, Argentina 29.10-3.11. 2000. Poster 13.
8. Bashan, Y., Moreno, M., Puente, M.E., Holguin, G., Vazquez, P., Troyo, E., and Glick , B.R. 2000. Inoculation of marine plants with marine plant growth-promoting bacteria and halotolerant *Azospirillum* - a novel approach of using PGPBs for the environment and seawater agriculture. 5th International plant growth-promoting rhizobacteria workshop. Villa Carlos Paz, Argentina 29.10-3.11. 2000. Poster 14.
9. Bashan, Y., Carrillo, A., Bethlenfalvay, G.J., Rojas, A. and Puente, ME. 2000. Prevention of desert soil erosion and enhancing soil stabilization by mycorrhizal fungi and by cactus plants inoculated with *Azospirillum brasilense*. 5th International plant growth-promoting rhizobacteria workshop. Villa Carlos Paz, Argentina 29.10-3.11. 2000. Poster 12.
10. Rojas, A., Holguin, G., Bashan, Y. and Glick, B.R. 2000. Mutualism between *Phyllobacterium* sp. (N₂ fixer) and *Bacillus licheniformis* (P-solubilizer) from semiarid mangrove rhizosphere. 5th International plant growth-promoting rhizobacteria workshop. Villa Carlos Paz, Argentina 29.10-3.11. 2000. Poster 112.
11. Larrinaga J. M, Bacilio M. J., Fraga P. H. and Lucero A. A. 2000. Efecto de la Composta en la Biomasa y el Crecimiento en Chiles (*Capsicum annum*,L.). XVIII Congreso de Fitogenetica. Irapuato Guanajuato. Mexico. 15-20.10. 2000. P. 360.

Staff and collaborations in 2000

Researchers

Dr. Yoav Bashan
 M.Sc. Gina Holguin (a Ph.D. student in Canada since 1997)
 Dr. Vladimir Lebsky
 Dr. Macario Bacilio

Students

IBQ Esther Puente- Ph.D. Student since 1999
 IBQ Angel Carrillo- M.Sc student since 1998
 pBiol. Adriana Rojas Since 1998.
 Agro. Moises Carcano - M.Sc student since 1997
 pBiol. Luis Alonso Leyva- since 2000
 Biol. Claudia Bravo- Colombia, Estancia de investigacion 6 months
 Two students of Social Service and Professional Practice (from UABCS, Mexico)

Associated researchers at the rank of technicians

Biol. Patricia Vazquez
 cM.Sc. Manuel Moreno
 cBiol. Juan-Pablo Hernandez
 M.Sc. Luz Gonzalez-Bashan

Local Collaborations in 2000

Dr. Jose Luis Leon de la Luz- Herbarium CIB- Conservation of cardons.
 Dr. Jose Bousillos- Oceanografia- Water bioremediation.

Foreign collaborations in 2000

Dr. C.Y. Li, USDA - Forestry, Corvallis Oregon, USA.- Rock weathering by plants
 Prof. B.R. Glick - University of Waterloo, Canada- Molecular biology of
Azospirillum.
 Assis. Prof. Luz Gonzalez and Profa. Luz T. Valderamma, Pontificia Universidad
 Javeriana, Bogota, Colombia. Water Bioremediation.
 Prof. Chen Dezhang, Dr. Liao Bowen, Forestry Research Institute, Goangzou,
 PRC (China). Inoculation of mangroves with beneficial bacteria.

Collaboration with the private sector

Laboratorios Agroenzimas- Tlanepantla, Estado de Mexico-New industrial
 project

Collaboration with the governmental sector

SEMARNAP - Conservation of cardons in Baja California Sur