

- Abel, S., Ticconi, C. A., Delatorre, C.A., (2002) Phosphate sensing in higher plants. *Physiol Plant* **115**,1–8.
- Abril, A., Zurdo-Pineiro, J. L., Peis, A., Rivas, R. and Velazquez E (2007) Solubilization of phosphate by a strain of *Rhizobium leguminosarium* bv *trifolii* isolated from *Phaseolus vulgaris* in El Chaco Arido soil (Argentina). In Velazquez E, Rodriguez-Berrueco C (eds) Book Series: Developments in Plant and Soil Sciences. Springer, The Netherlands. 135-138.
- Achal, V., Savant, V.V., Reddy S.M., (2007) Phosphate Solubilization by Wide Type Strain and UV-induced mutants of *Aspergillus tubingensis*. *Soil Biology and Biochemistry*. **39**, (2) 695-699, ISSN 0038-0717
- Afzal, A. and Bano, A. (2008) *Rhizobium* and Phosphate Solubilizing Bacteria Improve the Yield and Phosphorus Uptake in Wheat (*Triticum aestivum*). *International Journal of Agricultural Biology*. **10** (Suppl 1): 85-88
- Ahemad, M., and Khan, M. S. (2011). Functional aspects of plant growth promoting rhizobacteria: recent advancements. *Insight Microbiol*, **1**(3), 39-54.
- Ahmed, N., and Shahab, S. (2010). Involvement of bacterial pyrroloquinoline in plant growth promotion: A novel discovery. *World App. Sci. J*, **8**, 57-61.
- Alikhani, H.A., Saleh-Rastin, N. and Antoun, H. (2006) Phosphate solubilization activity of rhizobia native to Iranian soils. *Plant Soil*. **287**, 35–41.
- Ames, B. N. (1966). Assay of inorganic phosphate, total phosphate and phosphatases. *Methods Enzymol* **8**, 115–118.
- Andrews, M., Lea, P. J., Raven, J. A., and Azevedo, R. A. (2009). Nitrogen use efficiency. 3. Nitrogen fixation: genes and costs. *Annals of Applied Biology*, **155**(1), 1-13.
- Ankomah, A. B., Zapata, F., Hardarson, G., and Danso, S. K. (1996). Yield, nodulation, and N₂ fixation by cowpea cultivars at different phosphorus levels. *Biology and fertility of soils*, **22**(1-2), 10-15.

Anthony, A. O., and Kloepper, J. W. (2009). Plant-microbes interactions in enhanced fertilizer-use efficiency. *Applied microbiology and biotechnology*, **85**(1), 1-12.

Arcand, M. M. & Schneider, K. I. M. D. (2006) Plant- and microbial-based mechanisms to improve the agronomic effectiveness of phosphate rock: a review. *Anais Da Academia brasileira De Ciencias* **78**: 791-807.

Archana, G. (2010). Engineering Nodulation Competitiveness of Rhizobial Bioinoculants in Soils. In *Microbes for Legume Improvement* (157-194). Springer Vienna.

Archana, G., Buch A., Naresh Kumar G (2012) Pivotal role of organic acid secretion by rhizobacteria in plant growth promotion, In: Satyanarayan T, Johri BN, Prakash A, editors. *Microorganisms in Sustainable Agriculture and Biotechnology*. Springer, pp. 35-53.

Argaw, A. (2011). Evaluation of Co-inoculation of Bradyrhizobium japonicum and Phosphate Solubilizing Pseudomonas spp. Effect on Soybean (Glycine max L. Merr.) in Assosa Area. *Journal of Agricultural Science and Technology*, **14**(1), 213-224.

Ashraf, M. A., Asif, M., Zaheer, A., Malik, A., Ali, Q., and Rasool, M. (2013). Plant growth promoting rhizobacteria and sustainable agriculture: A review. *Afr J Microbiol*, **7**(9), 704-709.

Awasthi, R., Tewari, R., and Nayyar, H. (2011). Synergy between Plants and P-Solubilizing Microbes in soils: Effects on Growth and Physiology of Crops. *International Research Journal of Microbiology*, **2**(12), 484-503.

Azziz, G., Balsa, N., Haghjou, T., Taulé, C., Valverde, Á., Igual, J. M., and Arias, A. (2012). Abundance, diversity and prospecting of culturable phosphate solubilizing bacteria on soils under crop-pasture rotations in a no-tillage regime in Uruguay. *Applied Soil Ecology*, **61**, 320-326.

Babu-Khan, S., Yeo, T.C., Martin, W.L., Duron, M.R., Rogers, R.D. and Goldstein, A.H. (1995) Cloning of a mineral phosphate-solubilizing gene from *Pseudomonas cepacia*. *2012 Appl Environ Microbiol* **61**, 972-978.

Badawi, F. S. F., Biomy, A. M. M., & Desoky, A. H. (2011). Peanut plant growth and yield as influenced by co-inoculation with *Bradyrhizobium* and some rhizo-microorganisms under sandy loam soil conditions. *Annals of Agricultural Sciences*, 56(1), 17-25.

Bambara, S., and Ndakidemi, P. A. (2010). Phaseolus vulgaris response to Rhizobium inoculation, lime and molybdenum in selected low pH soil in Western Cape, South Africa. *African Journal of Agricultural Research*, 5(14), 1804-1811.

Banik, S. and Day, B.K. (1982) Available Phosphate Content of an Alluvial Soil as Influenced by Inoculation of Some Isolated Phosphate Solubilizing Microorganisms. *Plant and Soil*, 69, (3), 353-364, ISSN 1573-5036.

Bardgett, R. D., Bowman, W. D., Kaufmann, R., & Schmidt, S. K. (2005). A temporal approach to linking aboveground and belowground ecology. *Trends in Ecology & Evolution*, 20(11), 634-641.

Barker, W. W., Welch, S. A., Welch S. C., and Banfield, F., (1998) Experimental observations of the effects of bacteria on aluminosilicate weathering. *Amer. Mineral*, 83: 1551- 1563.

Barth, P. T., Datta, N. A. O. M. I., Hedges, R. W., and Grinter, N. J. (1976). Transposition of a deoxyribonucleic acid sequence encoding trimethoprim and streptomycin resistances from R483 to other replicons. *Journal of bacteriology*, 125(3), 800-810.

Basu, A. and Phale, P. S. (2006) Inducible uptake and metabolism of glucose by the phosphorylative pathway in *Pseudomonas putida* CSV86. *FEMS Microbiol. Lett.* 259(2), 311-316

Bernardelli, C. E., Luna, M. F., Galar, M. L., and Boiardi, J. L. (2001). Periplasmic PQQ-dependent glucose oxidation in free-living and symbiotic rhizobia. *Current Microbiology*, 42(5), 310-315.

Bernardelli, C. E., Luna, M. F., Galar, M. L., and Boiardi, J. L. (2008). Symbiotic phenotype of a membrane-bound glucose dehydrogenase mutant of *Sinorhizobium meliloti*. *Plant and soil*, 313(1-2), 217-225.

- Bert, Boesten. and Ursula, B. Priefer. (2004)** The C-terminal receiver domain of the *Rhizobium leguminosarum* bv. viciae FixL protein is required for free-living microaerobic induction of the *fnrN* promoter *Microbiology* **150**: 3703–3713
- Bianco, C., and Defez, R. (2009).** Medicago truncatula improves salt tolerance when nodulated by an indole-3-acetic acid-overproducing Sinorhizobium meliloti strain. *Journal of experimental botany*, **60**(11), 3097-3107.
- Bianco, C., and Defez, R. (2010).** Auxins upregulate nif and fix genes. *Plant signaling and behavior*, **5**(10), 1290-1294.
- Bianco, C., and Defez, R. (2010).** Improvement of phosphate solubilization and Medicago plant yield by an indole-3-acetic acid-overproducing strain of Sinorhizobium meliloti. *Applied and environmental microbiology*, **76**(14), 4626-4632.
- Bianco, C., Imperlini, E., Calogero, R., Senatore, B., Amoresano, A., Carpentieri, A. and Defez, R. (2006).** Indole-3-acetic acid improves Escherichia coli's defences to stress. *Archives of microbiology*, **185**(5), 373-382.
- Biswas, J.C., Ladha, J.K., Dazzo, F.B., (2000a)** Rhizobia inoculation improves nutrient uptake and growth of lowland rice. *Soil Sci Soc Am J.* **64**, 1644–1650.
- Bloemberg, G. V., & Lugtenberg, B. J. (2001).** Molecular basis of plant growth promotion and biocontrol by rhizobacteria. *Current opinion in plant biology*, **4**(4), 343-350.
- Bogino, P. C., Oliva, M. D. L. M., Sorroche, F. G., and Giordano, W. (2013).** The Role of Bacterial Biofilms and Surface Components in Plant-Bacterial Associations. *International journal of molecular sciences*, **14**(8), 15838-15859.
- Bogino, P. C., Oliva, M. D. L. M., Sorroche, F. G., and Giordano, W. (2013).** The Role of Bacterial Biofilms and Surface Components in Plant-Bacterial Associations. *International journal of molecular sciences*, **14**(8), 15838-15859.
- Bohlool, B. B., Ladha, J. K., Garrity, D. P., & George, T. (1992).** Biological nitrogen fixation for sustainable agriculture: A perspective. In *Biological nitrogen fixation for sustainable agriculture* (pp. 1-11). Springer Netherlands.

Boiardi, J., Galar, M. L. and Neijssel, O. M. (1996), PQQ-linked extracellular glucose oxidation and chemotaxis towards this cofactor in rhizobia. *FEMS Microbiology Letters*, **140**: 179–184.

Boiero, L., Perrig, D., Masciarelli, O., Penna, C., Cassan, F., and Luna, V. (2007). Phytohormone production by three strains of *Bradyrhizobium japonicum* and possible physiological and technological implications. *Applied microbiology and biotechnology*, **74**(4), 874–880.

Bomfeti, C. A., Florentino, L. A., Guimarães, A. P., Cardoso, P. G., Guerreiro, M. C., and Moreira, F. M. D. S. (2011). Exopolysaccharides produced by the symbiotic nitrogen-fixing bacteria of leguminosae. *Revista Brasileira de Ciência do Solo*, **35**(3), 657–671.

Bosworth, A. H., Williams, M. K., Albrecht, K. A., Kwiatkowski, R., Beynon, J., Hankinson, T. R., ... and Triplett, E. W. (1994). Alfalfa yield response to inoculation with recombinant strains of *Rhizobium meliloti* with an extra copy of *dctABD* and/or modified *nifA* expression. *Applied and environmental microbiology*, **60**(10), 3815–3832.

Bowatte, S., Tillman, R., Carran, A., and Gillingham, A. (2006). Can phosphorus fertilisers alone increase levels of soil nitrogen in New Zealand hill country pastures?. *Nutrient Cycling in Agroecosystems*, **75**(1-3), 57–66.

Buch , A., Archana, G. and Naresh Kumar, G. (2008) Metabolic channeling of glucose towards gluconate in phosphate-solubilizing *Pseudomonas aeruginosa* P4 under phosphorus deficiency. *Res Microbiol* **159**, 635–642.

Bugg, T., Foght, J. M., Pickard, M. A. and Gray, M. R. (2000) Uptake and active efflux of polycyclic aromatic hydrocarbons by *Pseudomonas fluorescens* LP6a. *Appl. Environ. Microbiol.* **66**, 5387–5392

Carmen, B., and Roberto, D. (2011). Soil Bacteria Support and Protect Plants Against Abiotic Stresses.

Castagno, L. N., Estrella, M. J., Sannazzaro, A. I., Grassano, A. E., and Ruiz, O. A. (2011). Phosphate-solubilization mechanism and in vitro plant growth promotion

activity mediated by *Pantoea eucalypti* isolated from *Lotus tenuis* rhizosphere in the Salado River Basin (Argentina). *Journal of Applied Microbiology*, **110**(5), 1151-1165.

Chabot, R., Antoun, H. Cescas, M. P., (1996) Growth promotion of maize and lettuce by phosphate-solubilizing *Rhizobium leguminosarum* biovar. *Phaseoli*, Plant and Soil. **184**, 311-321.

Chabot, R., Antoun, H., and Cescas, M. P. (1996). Growth promotion of maize and lettuce by phosphate-solubilizing *Rhizobium leguminosarum* biovar. *phaseoli*. *Plant and Soil*, **184**(2), 311-321.

Chanchal Kumar, Kavita Yadav, G. Archana and G. Naresh Kumar (2013) 2-Ketogluconic Acid Secretion by Incorporation of *Pseudomonas putida* KT 2440 Gluconate Dehydrogenase (*gad*) Operon in *Enterobacter asburiae* PSI3 Improves Mineral Phosphate Solubilization *Curr Microbiol.* **67**:388–394

Chen, Y. P., Rekha P. D., Arunshen A. B., Lai W. A., and Young C. C., (2006) Phosphate solubilizing bacteria from subtropical soil and their tricalcium phosphate solubilizing abilities. *Appl. Soil Ecol.* **34**, 33-41

Choi O, Kim J, Kim JG, Jeong Y, Moon JS, Park CS and Hwang I (2008) Pyrroloquinoline quinone is a plant growth promotion factor produced by *Pseudomonas fluorescens* B16. *Plant Physiol.* **146**: 657–668

Choi, K. H., and Kim, K. J. (2009). Applications of transposon-based gene delivery system in bacteria. *J Microbiol Biotechnol*, **19**(3), 217-228.

Choi, K. H., Trunck, L. A., Kumar, A., Mima, T., Karkhoff-Schweizer, R. R., and Schweizer, H. P. (2008)b. Genetic tools for *Pseudomonas*. *Pseudomonas: genomics and molecular biology*, ed. P. Cornelis.

Chou, C. P. (2007). Engineering cell physiology to enhance recombinant protein production in *Escherichia coli*. *Appl Microbiol Biotechnol* **76**, 521–532. doi:10.1007/s00253-007-1039-0.

Chung, C. N., Jun, W. J., and Park, I. H. (2009). Articles: Chemistry and Food; Introduction of a Bacterial Hemoglobin Gene for Improving Bacterial Growth under Hypoxic Condition. **43**(6), 77-84.

- Cordell, D., Drangert, J. O., and White, S. (2009).** The story of phosphorus: Global food security and food for thought. *Global environmental change*, **19**(2), 292-305.
- Cordell, D., Rosemarin, A., Schröder, J.J. and Smit, A.L.(2011).** Towards global phosphorus security: A systemsframework for phosphorus recovery and reuse options. *Chemosphere*, **84**: 747-758
- Costa, H., Gallego, S. M., and Tomaro, M. L. (2002).** Effect of UV-B radiation on antioxidant defense system in sunflower cotyledons. *Plant Science*, **162**(6), 939-945.
- Costa, P.B., Beneduzi, A., Souza, R., Schoenfeld, R., Vargas, L.K., Passaglia, L.M. (2013)** The effects of different fertilization conditions on bacterial plant growth promoting traits: guidelines for directed bacterial prospection and testing. *Plant Soil* **368**, 267–280.
- Crespo, J. M., Boiardi, J. L., and Luna, M. F. (2011).** Mineral phosphate solubilization activity of *Gluconacetobacter diazotrophicus* under P-limitation and plant root environment. *Agricultural Sciences*, **2**(1), 16-22.
- Crews, T. E., & Peoples, M. B. (2004).** Legume versus fertilizer sources of nitrogen: ecological tradeoffs and human needs. *Agriculture, Ecosystems & Environment*, **102**(3), 279-297.
- Cunningham, S. D., and MuNNS, D. N. (1984).** The correlation between extracellular polysaccharide production and acid tolerance in *Rhizobium*. *Soil Science Society of America Journal*, **48**(6), 1273-1276.
- Daimon, H., Nobuta, K., Ohe, M., Harada, J. and Nakayama, Y. (2006)** Tricalcium phosphate solubilization by root nodule bacteria of *Sesbania cannabina* and *Crotalaria juncea*. *Plant Prod Sci* **9**, 388–389.
- Dakora, F. D. (2003).** Defining new roles for plant and rhizobial molecules in sole and mixed plant cultures involving symbiotic legumes. *New Phytologist*, **158**(1), 39-49.
- Danhorn, T., and Fuqua, C. (2007).** Biofilm formation by plant-associated bacteria. *Annu. Rev. Microbiol.*, **61**, 401-422.

De Freitas, J.R., Banerjee, M.R., and Germida, J.J., (1997) Phosphate Solubilizing Rhizobacteria Enhance the Growth and Yield but not Phosphorous Uptake on Canola (*Brassica napus* L.). *Biology and Fertility of Soils*, **24**, (4) 358-364, ISSN 1432-0789

De Gelder, L., Ponciano, J. M., Joyce, P., and Top, E. M. (2007). Stability of a promiscuous plasmid in different hosts: no guarantee for a long-term relationship. *Microbiology*, **153**(2), 452-463.

de Souza, R., Beneduzi, A., Ambrosini, A., da Costa, P. B., Meyer, J., Vargas, L. K., ... and Passaglia, L. M. (2013). The effect of plant growth-promoting rhizobacteria on the growth of rice (*Oryza sativa* L.) cropped in southern Brazilian fields. *Plant and Soil*, 1-19.

Deakin , W.J. and Broughton , W.J. (2009) Symbiotic use of pathogenic strategies: rhizobial protein secretion systems . *Nat. Rev. Microbiol.* **7** :312 – 320 .

Deepa, C. K., Dastager, S. G., and Pandey, A. (2010). Isolation and characterization of plant growth promoting bacteria from non-rhizospheric soil and their effect on cowpea (*Vigna unguiculata* (L.) Walp.) seedling growth. *World Journal of Microbiology and Biotechnology*, **26**(7), 1233-1240.

Deshwal, V.K., Dubey, R.C., and Maheshwari, D.K., (2003) Isolation of plant-growth promoting strains of *Bradyrhizobium* (*Arachis*) sp. with biocontrol potential against *Macrophomina phaseolina* causing charcoal rot of peanut. *Curr Sci.* **84**, 443–448

Deubel, A.; Gransee, A. and Merbach, W. (2000). Transformation of Organic Rhizodeposits by Rhizoplane Bacteria and its Influence on the Availability of Tertiary Calcium Phosphate. *Journal of Plant Nutrition and Soil Science*, **163**, (4),387-392, ISSN 1436-8730

Dominati, E., Patterson, M., & Mackay, A. (2010). A framework for classifying and quantifying the natural capital and ecosystem services of soils. *Ecological Economics*, **69**(9), 1858-1868.

Dow, K. & Downing, T. E. The Atlas of Climate Change. 1-112 (University of California Press, 2007).

Dubey, R., and Olenyuk, B. (2010). Direct organocatalytic coupling of carboxylated piperazine-2, 5-diones with indoles through conjugate addition of carbon nucleophiles to indolenine intermediates. *Tetrahedron letters*, **51**(4), 609-612.

Dubois M, Gilles KA, Hamilton JK, Rebers PA, Smith F (1956) Calorimetric method for the determination of sugars and related substances, *Anal. Chem.*, **28**: 350 - 356.

Dudeja S.S and Narula, N. (2008). Molecular diversity of root nodule forming bacteria (Review) In: Agriculturally important microorganisms Vol II (Eds George G. Khachatourians; Dilip K. Arora ; T. P. Rajendran and Alok K. Srivastava) Academic World International. II. pp1-24.

Duine H (1991) Quinoproteins enzymes containing the quinonoid cofactor pyrroloquinoline quinone, topaquinone or tryptophantryptophan quinone. *Eur. J. Biochem.* 2000 271–284

Dutta, S., and Podile, A. R. (2010). Plant growth promoting rhizobacteria (PGPR): the bugs to debug the root zone. *Critical reviews in microbiology*, **36**(3), 232-244.

Eaglesham, A. R. J., Stowers, M. D., Maina, M. L., Goldman, B. J., Sinclair, M. J., and Ayanaba, A. (1987). Physiological and biochemical aspects of diversity of *Bradyrhizobium* sp.(Vigna) from three West African soils.*Soil Biology and Biochemistry*, **19**(5), 575-581.

Edwards, E. J., McCaffery, S., and Evans, J. R. (2005). Phosphorus status determines biomass response to elevated CO₂ in a legume: C₄ grass community. *Global Change Biology*, **11**(11), 1968-1981.

Elkoca E., Kantar, F. and Sahin, F. (2007) Influence of nitrogen fixing and phosphorus solubilizing bacteria on the nodulation, plant growth, and yield of chickpea. *J. Plant Nutrition* **31**: 157-171.

Elser, James J. (2012): "Phosphorus: a limiting nutrient for humanity?." *Current opinion in biotechnology* **23**, no. 6 833-838.

Erman, M., Yildirim, B., Togay, N., and Cig, F. (2009). Effect of phosphorus application and *Rhizobium* inoculation on the yield, nodulation and nutrient uptake in

field pea (*Pisum sativum* sp. *arvense* L.). *Journal of Animal and Veterinary Advances*, 8(2), 301-304.

Erman, M., Yildirim, B., Togay, N., and Cig, F. (2009). Effect of phosphorus application and *Rhizobium* inoculation on the yield, nodulation and nutrient uptake in field pea (*Pisum sativum* sp. *arvense* L.). *Journal of Animal and Veterinary Advances*, 8(2), 301-304.

Ezawa, T., S. E. Smith and F. A. Smith., (2002) P metabolism and transport in AM fungi. *Plant Soil* 244:221-230

FAOSTAT. Food and Agriculture Organization of the United Nations, Statistical Databases, Online at <http://faostat.fao.org> (2003).

Farhat, Mounira Ben, Amin Fourati, and Hichem Chouayekh(2013):. "Coexpression of the Pyrroloquinoline Quinone and Glucose Dehydrogenase Genes from *Serratia marcescens* CTM 50650 Conferred High Mineral Phosphate-Solubilizing Ability to *Escherichia coli*." *Applied biochemistry and biotechnology* 1-13.

Faure, D., Vereecke, D., and Leveau, J. H. (2009). Molecular communication in the rhizosphere. *Plant and soil*, 321(1-2), 279-303.

Franché C, Lindström K, Elmerich C (2009) Nitrogen-fixing bacteria associated with leguminous and non-leguminous plants. *Plant Soil* 321:35–59

Frey, A. D., and Kallio, P. T. (2003). Bacterial hemoglobins and flavohemoglobins: versatile proteins and their impact on microbiology and biotechnology. *FEMS microbiology reviews*, 27(4), 525-545.

Fuhrer, T., Fischer, E. and Sauer, U. (2005) Experimental identification and quantification of glucose metabolism in seven bacterial species. *J. Bacteriol.* 187, 1581-1590

Fujishige, N. A., Kapadia, N. N., De Hoff, P. L., and Hirsch, A. M. (2006). Investigations of *Rhizobium* biofilm formation. *FEMS microbiology ecology*, 56(2), 195-206.

García-Fraile P., Carro, L., Robledo M., Fernández M., Mateos P., Rivas R., Igual J., Peix A., Vela'zquez E.,(2012) Rhizobium Promotes Non-Legumes Growth and Quality in Several Production Steps: Towards a Biofertilization of Edible Raw Vegetables Healthy for Humans. *PLOS One*. 7, (5)

Geckil, H., Z. Barak, D. M. Chipman, S. O. Erenler, D. A. Webster, and B. C. Stark. 2004. Enhanced production of acetoin and butanediol in recombinant *Enterobacter aerogenes* carrying *Vitreoscilla* hemoglobin gene. *Bioproc. and Biosys. Engin.* 26: 325-30.

Giannopolitis, C. N., and Ries, S. K. (1977). Superoxide dismutases I. Occurrence in higher plants. *Plant physiology*, 59(2), 309-314.

Glick, B. R. (1995). Metabolic load and heterologous gene expression. *Biotechnology advances*, 13(2), 247-261.

Goldstein, A. H., and Liu, S. T. (1987). Molecular cloning and regulation of a mineral phosphate solubilizing gene from *Erwinia herbicola*. *Nature Biotechnology*, 5(1), 72-74.

Goldstein, A.H. (1995). Recent Progress in Understanding the Molecular Genetics and Biochemistry of Calcium Phosphate Solubilization by Gram-negative Bacteria. *Biological, Agriculture and Horticulture*, 12,(1), 185-193,ISSN 0144-8765.

Goosen, N., Horsman HP, Huinen RG and van de Putte P (1989) *Acinetobacter calcoaceticus* genes involved in biosynthesis of the coenzyme pyrrolo-quinoline-quinone nucleotide sequence and expression in *Escherichia coli* K-12. *J. Bacteriol.* 171: 447–455

Goosen, N., Huinen, R. G and van de Putte P (1992) A 24-amino-acid polypeptide is essential for the biosynthesis of the coenzyme pyrrolo-quinoline-quinone. *J. Bacteriol.* 174: 1426–1427

Graham, P. H., and Vance, C. P. (2003). Legumes: importance and constraints to greater use. *Plant physiology*, 131(3), 872-877.

Gresshoff, P.M., Lohar, D., Chan, P., Biswas, B., Jiang, Q., Reid, D., et al.

(2009) Genetic analysis of ethylene regulation of legume nodulation *Plant Signal. Behav.* 4 : 818 – 823 .

Gringauz, E., K. A. Orle, C. S. Waddell, and N. L. Craig (1988). Recognition of *Escherichia coli* attTn7 by transposon Tn7: Lack of specific sequence requirements at the point of Tn7 insertion. *J. Bacteriol.* 170, 2832-2840.

Gulati, A., Sharma, N., Vyas, P., Sood, S., Rahi, P., Pathania, V., and Prasad, R. (2010). Organic acid production and plant growth promotion as a function of phosphate solubilization by *Acinetobacter rhizosphaerae* strain BIHB 723 isolated from the cold deserts of the trans-Himalayas. *Archives of microbiology*, 192(11), 975-983.

Gull, M., Hafeez, F. Y., Saleem, M. and Malik, K. A. (2004) Phosphorus uptake and growth promotion of chickpea by co-inoculation of mineral phosphate solubilizing bacteria and a mixed rhizobial culture. *Aust. J. Exp. Agric.* 44: 623-628.

Gupta, A., Gopal, M., & Tilak, K. V. B. R. (2001). Rhizobacteria from field grown mungbean: Plant growth Promoting potential. *Indian Journal of Agricultural Research*, 35(1), 31-35.

Gyaneshwar, P., Kumar, G. N., Parekh, L. J., and Poole, P. S. (2002). Role of soil microorganisms in improving P nutrition of plants. *Plant and soil*, 245(1), 83-93.

Han, L. (2004). Genetically modified microorganisms. In *The GMO Handbook*(pp. 29-51). Humana Press.

Haque, N. A. and Dave, S. R., (2005) Ecology of phosphate solubilizers in semi-arid agricultural soils. *Indian J Microbiol* 45, 27–32.

Hardarson, G., and Atkins, C. (2003). Optimising biological N₂ fixation by legumes in farming systems. *Plant and soil*, 252(1), 41-54.

Hardoim, P. R., Nazir, R., Sessitsch, A., Elhottová, D., Korenblum, E., van Overbeek, L. S., and van Elsas, J. D. (2013). The new species *Enterobacter oryzophilus* sp. nov. and *Enterobacter oryzendophyticus* sp. nov. are key inhabitants of the endosphere of rice. *BMC microbiology*, 13(1), 164.

Hauge, J. G. (1964) Glucose dehydrogenase of *Bacterium anitratum*: an enzyme with a novel prosthetic group. *J Biol Chem.* **239**: 3630-3639.

Hayat, R., Ali, S., Amara, U., Khalid R., Ahmed, I., (2010) Soil beneficial bacteria and their role in plant growth promotion: a review. *Ann. Microbiol.* **60** (4): 579-598.

Herridge, D. F., Peoples, M. B., and Boddey, R. M. (2008). Global inputs of biological nitrogen fixation in agricultural systems. *Plant and Soil*, **311**(1-2), 1-18.

Hester, K. L., Lehman, J., Najar, F., Song, L., Roe, B. A., MacGregor, C. H., Hager, P. W., Phibbs, P. V. Jr. and Sokatch, J. R. (2000) Crc is involved in catabolite repression control of the bkd operons of *Pseudomonas putida* and *Pseudomonas aeruginosa*. *J. Bacteriol.* **182**, 1144-1149

Hungria, M., Nogueira, M. A., and Araujo, R. S. (2013). Co-inoculation of soybeans and common beans with rhizobia and azospirilla: strategies to improve sustainability. *Biology and Fertility of Soils*, **1-11**. in complete

Hwangbo, H., Park, R. D., Kim, Y. W., Rim, Y. S., Park, K. H., Kim, T. H., ... and Kim, K. Y. (2003). 2-ketogluconic acid production and phosphate solubilization by *Enterobacter intermedium*. *Current Microbiology*, **47**(2), 0087-0092.

Igual, J. M., Valverde A, Cervantes E, Velazquez E, (2001) Phosphate-solubilizing bacteria as inoculants for agriculture: use of updated molecular techniques in their study. *Agronomie*, **21** (Suppl 6-7): 561-568.

Imperlini, E., Bianco, C., Lonardo, E., Camerini, S., Cermola, M., Moschetti, G., and Defez, R. (2009). Effects of indole-3-acetic acid on *Sinorhizobium meliloti* survival and on symbiotic nitrogen fixation and stem dry weight production. *Applied microbiology and biotechnology*, **83**(4), 727-738.

Islam, M. T., and Hossain, M. M. (2012). Plant probiotics in phosphorus nutrition in crops, with special reference to rice. In *Bacteria in Agrobiolgy: Plant Probiotics*(325-363). Springer Berlin Heidelberg.

Israel, D. W. (1987). Investigation of the role of phosphorus in symbiotic dinitrogen fixation. *Plant Physiology*, **84**(3), 835-840.

Janczarek, M. (2011). Environmental signals and regulatory pathways that influence exopolysaccharide production in rhizobia. *International journal of molecular sciences*, 12(11), 7898-7933.

Janczarek, M., Jaroszuk-Ścisel, J., and Skorupska, A. (2009). Multiple copies of *rosR* and *pssA* genes enhance exopolysaccharide production, symbiotic competitiveness and clover nodulation in *Rhizobium leguminosarum* bv. *trifolii*. *Antonie Van Leeuwenhoek*, 96(4), 471-486.

Jayasinghearachchi, H. S., and Seneviratne, G. (2004). A bradyrhizobial-*Penicillium* spp. biofilm with nitrogenase activity improves N₂ fixing symbiosis of soybean. *Biology and fertility of soils*, 40(6), 432-434.

Johnson, S. E., & Loeppert, R. H. (2006). Role of organic acids in phosphate mobilization from iron oxide. *Soil Science Society of America Journal*, 70(1), 222-234.

Karaman, M. R., Şahin, S., Düzdemir, O., and Kandemir, N. (2013). Selection of chickpea cultivars with agronomic phosphorus (P) utilization characters as influenced by *Rhizobium* inoculation. *Scientific Research and Essays*, 8(17), 676-681.

Karasu A, O " z M, Dog'an R (2009) The effect of bacterial inoculation and different nitrogen doses on yield and yield components of some chickpea genotypes (*Cicer arietinum* L.). *African J Biotechnol* 8:59–64

Katznelson, H. and Bose, B. (1959) Metabolic activity and phosphate dissolving capability of bacterial isolates from wheat roots in the rhizosphere and non rhizosphere soil. *Can. J. Microbiol.* 5: 79-85.

Khairnar, N. P., Misra, H. S., and Apte, S. K. (2003). Pyrroloquinoline–quinone synthesized in *Escherichia coli* by pyrroloquinoline–quinone synthase of *Deinococcus radiodurans* plays a role beyond mineral phosphate solubilization. *Biochemical and biophysical research communications*, 312(2), 303-308..

Khan, A.A., Jilani G., Akhtar, M. S., Saqlan, S. M., Rasheed, N. M., (2009) Phosphorus Solubilizing Bacteria: Occurrence, Mechanisms and their Role in Crop Production. *J. Agric. Biol. Sci.*, 1, (1) 48-58.

Khan, K. S., and Joergensen, R. G., (2009) Changes in microbial biomass and P fractions in biogenic household waste compost amended with inorganic P fertilizers. *Bioresource Technology*.100, 303-309.

Khosravi, M., D. A. Webster, and B. C. Stark. 1990. Presence of the bacterial hemoglobin gene improves α -amylase production of a recombinant *Escherichia coli* strain. *Plasmid* 24: 1-5.

Kim KY, Jordan D, Krishnan HB (1998) Expression of genes from *Rahnella aquatilis* that are necessary for mineral phosphate solubilization in *Escherichia coli*. *FEMS Microbiol Lett* 159: 121–127.

Kim, C. H., Han, S. H., Kim, K. Y., Cho, B. H., Kim, Y. H., Koo, B. S., and Kim, Y. C. (2003). Cloning and expression of pyrroloquinoline quinone (PQQ) genes from a phosphate-solubilizing bacterium *Enterobacter intermedius*. *Current microbiology*, 47(6), 457-461.

Kloepper, J.W., Leong, J., Teintze, M. & Scroth, M.N., (1980) Enhanced plant growth by siderophores produced by plant growth-promoting rhizobacteria, *Nature* 286, 885-886.

Koch, B., Jensen, L. E. and Nybroe, O. (2001). A panel of Tn7-based vectors for insertion of the *gfp* marker gene or for delivery of cloned DNA into Gram-negative bacteria at a neutral chromosomal site. *Journal of Microbiological Methods*.

Koch, B., Worm, J., Jensen, L. E., Hojberg, O. and Nybroe, O. (2001) Carbon limitation induces σ^S -dependent gene expression in *Pseudomonas fluorescens* in soil. *Appl. Environ. Microbiol.* 67: 3363-3370.

Kouchi, H. , Imaizumi-Anraku, H. , Hayashi, M. , Hakoyama, T. , Nakagawa, T. , Umehara, Y. , et al . (2010) How many peas in a pod? Legume genes responsible for mutualistic symbioses underground. *Plant Cell Physiol.* 51 : 1381 – 1397 .

Kovach, M. E., Elzer, P. H., Hill, D. S. Robertson, G. T., Farris, M. A., Roop, R. M. II and Peterson, K. M. (1995) Four new derivatives of the broad-host-range cloning vector pBBR1MCS, carrying different antibiotic-resistance cassettes. *Gene*, 166: 175-176.

- Krishnaraj, P. U. and Goldstein, A. H. (2001)** Cloning of a *Serratia marcescens* DNA fragment that induces quinoprotein glucose dehydrogenase-mediated gluconic acid production in *Escherichia coli* in the presence of stationary phase *Serratia marcescens*. *FEMS Microbiol. Lett.* **205**: 215-220.
- Kumar R. and Chandra R. (2008)** Influence of PGPR and PSB on *Rhizobium leguminosarum* bv. *viciae* strain competition and symbiotic performance in lentil. *World J. Agricultural Sciences* **4**, 297-301.
- Lambertsen, L., Sternberg, C. and Molin, S. (2004).** Mini-Tn7 transposons for site-specific tagging of bacteria with fluorescent proteins. *Environmental microbiology* **6**, 726-32.
- Lazarovits, G., and Nowak, J. (1997).** Rhizobacteria for improvement of plant growth and establishment. *HortScience*, **32**(2), 188-192.
- Lekberg, Y., and Koide, R. T. (2005).** Arbuscular mycorrhizal fungi, rhizobia, available soil P and nodulation of groundnut (*Arachis hypogaea*) in Zimbabwe. *Agriculture, ecosystems and environment*, **110**(3), 143-148.
- Lessie, T. G. and Phibbs, P. V. Jr. (1984)** Alternative pathways of carbohydrate utilization in pseudomonads. *Annu. Rev. Microbiol.* **38**: 359–388
- LeVier , K. , Phillips , R.W. , Grippe , V.K. , Roop , R.M. and Walker , G.C. (2000)** Similar requirements of a plant symbiont and a mammalian pathogen for prolonged intercellular survival . *Science* **287** : 2492 – 2493 .
- Lichtenstein, C. and S. Brenner (1981).** Site-specific properties of Tn7 transposition into the *E. coli* chromosome. *Mol. Gen. Genet.* **183** , 380-387.
- Lindström, K., Murwira, M., Willems, A., and Altier, N. (2010).** The biodiversity of beneficial microbe-host mutualism: the case of rhizobia. *Research in microbiology*, **161**(6), 453-463.
- López-Arredondo, DL., Herrera-Estrella, L., (2012)** Engineering phosphorus metabolism in plants to produce a dual fertilization and weed control system. *Nature Biotechnology* **30**, 889–893.

Lowry O.H., Rosenbrough N.J., Farr A.L., Randall R.J. (1951) Protein measurement with folin-phenol reagent. *J. Biol. Chem.*, **193**: 265–275.

Mabrouk Y., and Belhadj, O. (2010). The Potential Use of Rhizobium–Legume Symbiosis for Enhancing Plant Growth and Management of Plant Diseases. In *Microbes for Legume Improvement* (495-514). Springer Vienna.

Mäder, P., Kaiser, F., Adholeya, A., Singh, R., Uppal, H. S., Sharma, A. K., ... & Fried, P. M. (2011). Inoculation of root microorganisms for sustainable wheat–rice and wheat–black gram rotations in India. *Soil Biology and Biochemistry*, *43*(3), 609-619.

Madsen, E.B., Antolín-Llovera, M., Grossmann, C., Ye, J., Vieweg, S., Broghammer, A., Krusell, L., Radutoiu, S., Jensen, O.N., Stougaard, J., and Parniske, M. (2011). Autophosphorylation is essential for the in vivo function of the *Lotus japonicus* Nod factor receptor 1 and receptor-mediated signaling in cooperation with Nod factor receptor 5. *Plant J.* **65**:404–417.

Magnusson, O. T, Toyama H, Saeki M, Schwarzenbacher R, Klinman J. P (2004) The structure of a biosynthetic intermediate of pyrroloquinoline quinone (PQQ) and elucidation of the final step of PQQ biosynthesis. *Journal of the American Chemical Society* **126**(17):5342-5343.

Mahatma, M. K., Bhatnagar, R., Mittal, G. K., and Mahatma, L. (2011). Antioxidant metabolism in pearl millet genotypes during compatible and incompatible interaction with downy mildew pathogen. *Archives of Phytopathology and Plant Protection*, *44*(9), 911-924.

Marinkovic, J., Dordevic, V., Svetlana, (2013) Osmotic stress tolerance, PGP traits and RAPD analysis of *Bradyrhizobium Japonicum* strains. **45**, (1), 75-86.

Martínez-Viveros, O., Jorquera, M. A., Crowley, D. E., Gajardo, G., and Mora, M. L. (2010). Mechanisms and practical considerations involved in plant growth promotion by rhizobacteria. *Journal of soil science and plant nutrition*, *10*(3), 293-319.

Mathur, T., Singhal, S., Khan, S., Upadhyay, U.P., Fatma, F. and Rattan, A., (2006) Detection of bio film formation among the clinical isolates of staphylococci: an

evaluation of three different screening methods. *Indian Journal of Medical Microbiology* **24** (1):25-29.

Matsushita, K. and Ameyama, M. (1982) D-glucose-dehydrogenase from *Pseudomonas fluorescens*, membrane bound. *Methods Enzymol.* **89**: 149-154.

McKenzie G.J, Craig N.L., (2006) Fast, easy and efficient: site-specific insertion of transgenes into enterobacterial chromosomes using Tn7 without need for selection of the insertion event. *BMC Microbiol.* **6**:39-46

Mehboob, I., Naveed, M., Zahir, A. Z., 2009. Rhizobial association with non-legumes: mechanisms and applications. *Crit. Rev. Plant Sci.* **28**, 432–456.

Mendrygal, K. E., and González, J. E. (2000). Environmental regulation of exopolysaccharide production in *Sinorhizobium meliloti*. *Journal of bacteriology*, **182**(3), 599-606.

Meulenberg JJ , Sellink E, Loenen WAM, Riegman NH, Van Kleef M, Postma PW (1990) Cloning of *Klebsiella pneumoniae* *pqq* genes and PQQ biosynthesis in *Escherichia coli*. *FEMS Microbiol Lett* **71**:337–344.

Meulenberg JJ, Sellink E, Riegman NH, Postma PW (1992) Nucleotide sequence and structure of the *Klebsiella pneumoniae* *pqq* operon. *Mol Gen Genet* **232**:284–294

Mia, M. A., Shamsuddin, Z. H. (2010) Rhizobium as a crop enhancer and biofertilizer for increased cereal production. *Afr J Biotechnol.* **9**, 6001–6009

Midgley, M. and Dawes, E. A. (1973) The regulation of transport of glucose and methyl aglucoside in *Pseudomonas aeruginosa*. *Biochem. J.* **132**:141-154

Misra, H. S., Rajpurohit, Y. S., and Khairnar, N. P. (2012). Pyrroloquinoline-quinone and its versatile roles in biological processes. *Journal of biosciences*, **37**(2), 313-325.

Moghimi, A., Tate, M. E., and Oades, J. M. (1978). Characterization of rhizosphere products especially 2-ketogluconic acid. *Soil Biology and Biochemistry*, **10**(4), 283-287.

Monds RD, Silby MW, Mahanty HK. 2001. Expression of the Pho regulon negatively regulates biofilm formation by *Pseudomonas aureofaciens* PA147-2. *Mol. Microbiol.* **42**:41542– 426.

Morel M., Victoria Braña and Susana Castro-Sowinski (2012). Legume Crops, Importance and Use of Bacterial Inoculation to Increase Production, Crop Plant, Dr Aakash Goyal (Ed.), ISBN: 978-953-51-0527-5,

incorrect
citation

Morrissey, J. P., Walsh, U. F., O'Donnell, A., Moënne-Loccoz, Y., and O'Gara, F. (2002). Exploitation of genetically modified inoculants for industrial ecology applications. *Antonie Van Leeuwenhoek*, **81**(1-4), 599-606.

Nakano, Y., and Asada, K. (1981). Hydrogen peroxide is scavenged by ascorbate-specific peroxidase in spinach chloroplasts. *Plant and Cell Physiology*, **22**(5), 867-880.

Nelson, K. E., et al. (2002) Complete genome sequence and comparative analysis of the metabolically versatile *Pseudomonas putida* KT2440. *Environ. Microbiol.* **4** (12), 799-808

Neubauer, P., Lin, H. Y., and Mathisizik, B. (2003). Metabolic load of recombinant protein production: inhibition of cellular capacities for glucose uptake and respiration after induction of a heterologous gene in *Escherichia coli*. *Biotechnology and bioengineering*, **83**(1), 53-64.

O'Hara, G. W. (2001). Nutritional constraints on root nodule bacteria affecting symbiotic nitrogen fixation: a review. *Animal Production Science*, **41**(3), 417-433.

Okazaki, S., Nukui, N., Sugawara, M. and Minamisawa, K. (2004) Rhizobial strategies to enhance symbiotic interactions: rhizobitoxine and 1-aminocyclopropane-1-carboxylate deaminase. *Microbes Environ.* **19** : 99 – 111 .

Oldroyd, G.E., and Downie, J.A. (2008). Coordinating nodule morphogenesis with rhizobial infection in legumes. *Ann.Rev. Plant Biol.* **59**:519-546.

Ow, D. S. W., Lee, D. Y., Yap, M. G. S., and Oh, S. K. W. (2009). Identification of cellular objective for elucidating the physiological state of plasmid-bearing

Escherichia coli using genome-scale in silico analysis. *Biotechnology progress*, **25**(1), 61-67.

Ow, D. S. W., Nissom, P. M., Philp, R., Oh, S. K. W., Yap, M. G. S. (2006). Global transcriptional analysis of metabolic burden due to plasmid maintenance in Escherichia coli DH5 during batch fermentation. *Enzyme Microb Technol* **39**, 391–398. doi:10.1016/j.enzmitec.2005.11.048.

P. Conforte, V., Echeverria, M., Sánchez, C., A. Ugalde, R., B. Menéndez, A., and C. Lepek, V. (2010). Engineered ACC deaminase-expressing free-living cells of *Mesorhizobium loti* show increased nodulation efficiency and competitiveness on *Lotus* spp. *The Journal of General and Applied Microbiology*, **56**(4), 331-338.

Pandey, P., ARORA, S., SOOD, A., BISHT, S., & MAHESHWARI, D. (2009, October). FORMULATION OF AN EFFECTIVE RHIZOBIUM BIOINOCULANT USING GREEN FLUORESCENT PROTEIN REPORTER SYSTEM. In *Chemical, Biological and Environmental Engineering-Proceedings of the International Conference on Cbee 2009* (p. 462). World Scientific.

Park KH, Lee OM, Jung HI, Jeong JH, Jeon YD, Hwang DY, Lee CY, Son HJ (2010) Rapid solubilization of insoluble phosphate by a novel environmental stress-tolerant Burkholderia vietnamiensis M6 isolated from ginseng rhizospheric soil. *Appl Microbiol Biotechnol* **86**:947–955

Patel, D. K., Archana G. and Naresh Kumar G. (2008) Variation in the nature of organic acid secretion and mineral phosphate solubilization by *Citrobacter* sp. in the presence of different sugars. *Curr. Microbiol.* **56**(2), 168-174

Peix, A. Rivas-Boyer, A.A. Mateos, P.F. Rodriguez-Barrueco, C., E. MartõÁñez-Molina and E. Velazquez (2001) Growth promotion of chickpea and barley by a phosphate solubilizing strain of *Mesorhizobium mediterraneum* under growth chamber conditions. *Soil Biology and Biochemistry* **33** 103-110.

Peix, A., Lang, E., Verbarg, S., Spro"er, C., Rivas, R., SantaRegina, I., Mateos, P.F., Martí'nez-Molina, E. et al. (2009) *Acinetobacter* strains IH9 and OCI1, two rhizospheric phosphate solubilizing isolates able to promote plant growth, constitute a new genomovar of *Acinetobacter calcoaceticus*. *Syst Appl Microbiol* **32**, 334–341

Perez, Elizabeth, Miguel Sulbaran, María M. Ball, and Luis Andres Yarzabal(2007): "Isolation and characterization of mineral phosphate-solubilizing bacteria naturally colonizing a limonitic crust in the south-eastern Venezuelan region." *Soil Biology and Biochemistry* 39, no. 11 2905-2914.

Persello-Cartieaux, F, Nussaume, L, Robaglia, C. (2003). Tales from the underground, molecular plant-rhizobacteria interactions. *Plant Cell Environ* 26, 189–199.

Perveen, S., M. S. Khan and A. Zaidi. 2002. Effect of rhizospheric microorganisms on growth and yield of green gram (*Phaseolus radiatus*). *Ind. J. Agric. Sci.* 72:421-423.

Peters, J. E. and Craig, N. L. (2001). Tn7 : Smarter Than we thought. *Cell* 2, 806-814.

Peterson, G. L. (1979) Review of the Folin phenol quantitation method of Lowry, Rosenberg, Farr and Randall. *Anal Biochem* 100: 201.

Pikovskaya, R. I. (1948) Mobilization of phosphorus in soil in connection with vital activity of some microbial species. *Mikrobiologiya* 17: 362–370.

Pirhofer-Walzl, K., Rasmussen, J., Høgh-Jensen, H., Eriksen, J., Sørensen, K., & Rasmussen, J. (2012). Nitrogen transfer from forage legumes to nine neighbouring plants in a multi-species grassland. *Plant and soil*, 350(1-2), 71-84.

Plenchette, C., and Morel, C. (1996). External phosphorus requirement of mycorrhizal and non-mycorrhizal barley and soybean plants. *Biology and fertility of soils*, 21(4), 303-308.

Popp, C., & Ott, T. (2011). Regulation of signal transduction and bacterial infection during root nodule symbiosis. *Current opinion in plant biology*, 14(4), 458-467.

Puehringer, S., Metlitzky M, Schwarzenbacher R. (2008) The pyrroloquinoline quinone biosynthesis pathway revisited: a structural approach *BMC Biochem.* 9: 8.

Pueppke, S. G., & Broughton, W. J. (1999). Rhizobium sp. strain NGR234 and R. fredii USDA257 share exceptionally broad, nested host ranges. *Molecular plant-microbe interactions*, 12(4), 293-318.

- Quay, S. C., Friedman, S. B. and Eisenberg, R. C. (1972) Gluconate regulation of glucose catabolism in *Pseudomonas fluorescens*. *J. Bacteriol.* **112**: 291-298.
- Qureshi, M. A., M. A. Shakir, A. Iqbal, N. Akhtar and A. Khan (2011) CO-Inoculation of phosphate solubilizing bacteria and rhizobia for improving growth and yield of mungbean (*Vigna radiata* L.) *The Journal of Animal and Plant Sciences*, **21**(3):, Page: 491-497.
- Raghothama, K.G., Muchhal, U.S., Kim, D.H., Bucher, M. (1999) Molecular regulation of plant phosphate transporters. In: Lynch, J. P., Deikman, J. (eds) *Phosphorus in plant biology: regulatory roles in molecular, cellular, organismic, and ecosystem processes*, American society of plant physiologists, Maryland. 271–280
- Rajpurohit, Y. S., Gopalakrishnan, R, and Misra, H. S (2008) Involvement of a protein kinase activity inducer in DNA double strand break repair and radioresistance of *Deinococcus radiodurans*. *J. Bacteriol.* **190**: 3948–3954
- Ramírez, M., Valderrama, B., Arredondo-Peter, R., Soberón, M., Mora, J., and Hernández, G. (1999). *Rhizobium etli* genetically engineered for the heterologous expression of *Vitreoscilla* sp. hemoglobin: effects on free-living and symbiosis. *Molecular plant-microbe interactions*, **12**(11), 1008-1015.
- Ramos, H. J., Roncato-Maccari, L. D., Souza, E. M., Soares-Ramos, J. R., Hungria, M., & Pedrosa, F. O. (2002). Monitoring *Azospirillum*-wheat interactions using the *gfp* and *gusA* genes constitutively expressed from a new broad-host range vector. *Journal of Biotechnology*, **97**(3), 243-252.
- Rao, M. R., and Mathuva, M. N. (2000). Legumes for improving maize yields and income in semi-arid Kenya. *Agriculture, ecosystems and environment*, **78**(2), 123-137.
- Rashid, H.K., M.D. Mohiuddin and M. Rahman(2008) Enumeration, isolation and identification of nitrogen fixing bacterial strains at seedling stage in rhizosphere of rice grown in non-calcareous grey flood plain soil of Bangladesh. *Journal of the Faculty of Environmental Science and Technol.*, **13**, 97-101.
- Raven, P.H., Johnson, G. B. (2008). *Biology*. 8th ed. McGraw- Hill Companies, Inc., NY. Remans, R.; Croonenborghs, A.; Torres Gutierrez, R.; Michiels, J. and

Vanderleyden, J. Effects of plant growth-promoting rhizobacteria on nodulation of *Phaseolus vulgaris* L. are dependent on plant nutrition. *European Journal of Plant Pathology*, Vol.119, pp.341-351,

Rengel, Z. (2002). Breeding for better symbiosis. *Plant and Soil*, **245**(1), 147-162.

Renilla, S., Bernal, V., Fuhrer, T., Castaño-Cerezo, S., Pastor, J. M., Iborra, J. L and Cánovas, M. (2012). Acetate scavenging activity in *Escherichia coli*: interplay of acetyl-CoA synthetase and the PEP-glyoxylate cycle in chemostat cultures. *Applied microbiology and biotechnology*, **93**(5), 2109-2124.

Rinaudi L, Fujishige NA, Hirsch AM, Banchio E, Zorreguieta A and Giordano W (2006) Effects of nutritional and environmental conditions on *Sinorhizobium meliloti* biofilm formation. *Res Microbiol* **157**: 867–875.

Rinaudi, L. V., and Giordano, W. (2010). An integrated view of biofilm formation in rhizobia. *FEMS microbiology letters*, **304**(1), 1-11.

Rinaudi, L. V., Sorroche, F., Zorreguieta, Á., and Giordano, W. (2010). Analysis of the *mucR* gene regulating biosynthesis of exopolysaccharides: implications for biofilm formation in *Sinorhizobium meliloti* Rm1021. *FEMS microbiology letters*, **302**(1), 15-21.

Rodríguez, H., and Fraga, R. (1999). Phosphate solubilizing bacteria and their role in plant growth promotion. *Biotechnology advances*, **17**(4), 319-339.

Rogers, M., N. Ekaterinaki, E. Nimmo, and D. Sherratt (1986). Analysis of Tn7 transposition. *Mol. Gen. Genet.* **205**, 550-556.

Ronson, C. W. and Primrose, S. B. (1979). *J.Gen. Microbial.* **112**:77-88

Rosas SB, Andres GA, Rovera M, Correa NS, 2006. Phosphate solubilizing *Pseudomonas putida* can influence the Rhizobia legume symbiosis. *Soil Biol Biochem.* **38**: 3502-3505.

Rouws, L. F. M., Meneses, C. H. S. G., Guedes, H. V., Vidal, M. S., Baldani, J. I., & Schwab, S. (2010). Monitoring the colonization of sugarcane and rice plants by the endophytic diazotrophic bacterium *Gluconacetobacter diazotrophicus* marked with *gfp* and *gusA* reporter genes. *Letters in applied microbiology*, **51**(3), 325-330.

- Rozkov, A., Avignone-Rossa, C. A., Ertl, P. F., Jones, P., O'Kennedy, R. D., Smith, J. J. and Bushell, M. E. (2004). Characterization of the metabolic burden on *Escherichia coli* DH1 cells imposed by the presence of a plasmid containing a gene therapy sequence. *Biotechnology and bioengineering*, **88**(7), 909-915.
- Rucker Robert; Winyoo Chowanadisai; Masahiko, Nakano. (2009) Potential Physiological Importance of Pyrroloquinoline Quinone Alternative Medicine Review **14**:(3)
- Rudresh, D. L., Shivaprakash, M. K., and Prasad, R. D. (2005). Effect of combined application of *Rhizobium* phosphate solubilizing bacterium and *Trichoderma* spp. on growth, nutrient uptake and yield of chickpea (*Cicer aritenium* L.). *Applied soil ecology*, **28**(2), 139-146.
- Rugheim AME, Abdelgani, ME, 2012. Effects of microbial and chemical fertilization on yield and seed quality of faba bean (*Vicia faba*). *Int Food Res J.* **19**(2): 417-422
- Russo, A., Carrozza, G. P., Vettori, L., Felici, C., Cinelli, F., & Toffanin, A. (2012) Plant Beneficial Microbes and Their Application in Plant Biotechnology. *Innovations in Biotechnology*, Dr. Eddy C. Agbo (Ed.), ISBN: 978-953-51-0096-6
- Ryan, J., Ibriki, H., Delgado, A., Torrent, J., Sommer, R., and Rashid, A. (2012). 3 Significance of Phosphorus for Agriculture and the Environment in the West Asia and North Africa Region. *Advances in Agronomy*, **114**, 91.
- Sahasrabudhe, M. M. (2011). Screening of rhizobia for indole acetic acid production. *Ann Biol Res*, **2**(4), 460-468.
- Saichana, I., Ano, Y., Adachi, O., Matsushita, K., and Toyama, H. (2007). Preparation of enzymes required for enzymatic quantification of 5-keto-D-gluconate and 2-keto-D-gluconate. *Bioscience, biotechnology, and biochemistry*, (0), 0709070545.
- Saiki, Y., Habe, H., Yuuki, T., Ikeda, M., Yoshida, T., Nojiri, H., and Omori, T. (2003). Rhizoremediation of dioxin-like compounds by a recombinant *Rhizobium tropici* strain expressing carbazole 1, 9a-dioxygenase constitutively. *Bioscience, biotechnology, and biochemistry*, **67**(5), 1144-1148.

- Saiki, Y., Habe, H., Yuuki, T., Ikeda, M., Yoshida, T., Nojiri, H., and Omori, T. (2003). Rhizoremediation of dioxin-like compounds by a recombinant *Rhizobium tropici* strain expressing carbazole 1, 9a-dioxygenase constitutively. *Bioscience, biotechnology, and biochemistry*, 67(5), 1144-1148.
- Sambrook, J. and Russell, D. W. (2001) Molecular Cloning: a Laboratory Manual, 3rd edn. Cold Spring Harbor, NY: Cold Spring Harbor Laboratory.
- Sánchez-Calderón, L., Chacon-López, A., Pérez-Torres, C. A., and Herrera-Estrella, L. (2010). Phosphorus: plant strategies to cope with its scarcity. In *Cell Biology of Metals and Nutrients* (pp. 173-198). Springer Berlin Heidelberg.
- Sanginga, N. (2003). Role of biological nitrogen fixation in legume based cropping systems; a case study of West Africa farming systems. *Plant and Soil*, 252(1), 25-39.
- Santos, M. A. D., Nicolás, M. F., & Hungria, M. (2006). Identification of QTL associated with the symbiosis of *Bradyrhizobium japonicum*, *B. elkanii* and soybean. *Pesquisa Agropecuária Brasileira*, 41(1), 67-75.
- Schenk, P. M., Carvalhais, L. C., and Kazan, K. (2012). Unraveling plant-microbe interactions: can multi-species transcriptomics help?. *Trends in biotechnology*, 30(3), 177-184.
- Schenk, P. M., Carvalhais, L. C., and Kazan, K. (2012). Unraveling plant-microbe interactions: can multi-species transcriptomics help?. *Trends in biotechnology*, 30(3), 177-184.
- Schleissner, C., Reglero, A. and Luengo, J. M. (1997) Catabolism of D-glucose by *Pseudomonas putida* U occurs via extracellular transformation into D-gluconic acid and induction of a specific gluconate transport system. *Microbiol.* 143: 1595-1603
- Schmidt-Eisenlohr, H. and Baron, C. (2003). The competitiveness of *Pseudomonas chlororaphis* carrying pJP4 is reduced in the *Arabidopsis thaliana* rhizosphere. *Appl Environ Microbiol* 69, 1827-1831. doi:10.1128/AEM.69.3.1827-1831.2003.
- Schweizer, H. P. (1991). Escherichia-Pseudomonas shuttle vectors derived from pUC18/19. *Gene*, 97(1), 109-112.

Sgherri, C. L. M., Maffei, M., & Navari-Izzo, F. (2000). Antioxidative enzymes in wheat subjected to increasing water deficit and rewatering. *Journal of plant physiology*, 157(3), 273-279.

Shahid, M., Hameed, S., Imran, A., Ali, S., and van Elsas, J. D. (2012). Root colonization and growth promotion of sunflower (*Helianthus annuus* L.) by phosphate solubilizing *Enterobacter* sp. Fs-11. *World Journal of Microbiology and Biotechnology*, 28(8), 2749-2758.

Sharma, M. P., Jaisinghani, K., Sharma, S. K., and Bhatia, V. S. (2012). Effect of Native Soybean Rhizobia and AM Fungi in the Improvement of Nodulation, Growth, Soil Enzymes and Physiological Status of Soybean Under Microcosm Conditions. *Agricultural Research*, 1(4), 346-351.

Sharma, V., Archana, G., and Naresh Kumar, G. (2011). Plasmid load adversely affects growth and gluconic acid secretion ability of mineral phosphate-solubilizing rhizospheric bacterium *Enterobacter asburiae* PSI3 under P limited conditions. *Microbiological Research*, 166(1), 36-46.

Shashidhar, B, Podile A. R (2009) Transgenic expression of glucose dehydrogenase in *Azotobacter vinelandii* enhances mineral phosphate solubilization and growth of sorghum seedlings. *Microb Biotechnol* 4:521–529

Shen, Yao-Qing, Florence Bonnot, Erin M. Imsand, Jordan M. RoseFigura, Kimmen Sjo lander, and Judith P. Klinman. (2012) Distribution and Properties of the Genes Encoding the Biosynthesis of the Bacterial Cofactor, Pyrroloquinoline Quinone *Biochemistry* 51: 2265–2275

Shim, H., Chauhan, S., Ryoo, D., Bowers, K., Thomas, S. M., Burken, J. G., and Wood, T. K. (2000). Rhizosphere competitiveness of trichloroethylene-degrading, poplar-colonizing recombinant bacteria. *Applied and environmental microbiology*, 66(11), 4673-4678.

Shridhar, B. S. (2012) "Review: Nitrogen Fixing Microorganisms. *Intl. J* 3.1, 46-52.

Shridhar, B. S. (2012). Review: Nitrogen Fixing Microorganisms. *International Journal of*.

Sibley, M. H., and Raleigh, E. A. (2012). A versatile element for gene addition in bacterial chromosomes. *Nucleic acids research*, **40**(3), e19-e19.

Simons, M., Van Der Bij, A. J., Brand, I., De Weger, L. A., Wijffelman, C. A., and Lugtenberg, B. J. (1996). Gnotobiotic system for studying rhizosphere colonization by plant growth-promoting *Pseudomonas* bacteria. *MPMI-Molecular Plant Microbe Interactions*, **9**(7), 600-607.

Singh Y., and Sharma, A. (2011). Effect of sources of phosphorus and microbial inoculation on productivity, nutrient availability in soil and uptake of nutrients by chickpea (*Cicer arietinum*) grown on sandy loam soil. *The Indian Journal Of Agricultural Sciences*, **81**(9).

Singh, J. S., Pandey, V. C., and Singh, D. P. (2011). Efficient soil microorganisms: a new dimension for sustainable agriculture and environmental development. *Agriculture, Ecosystems and Environment*, **140**(3), 339-353.

Singh, R. K., Rai, A., Sharma, S., Singh, S. P., and Srivastava, D. K. (2011). Effect of Biofertilizer on Nodulation of Pea (*Pisum Sativum* L.) in Alluvial Soil. *Annals of Horticulture*, **4**(2), 147-150.

Sinha, B. K., Basu P. S (1981) Indole-3-acetic acid and metabolism in root nodules of *Pongamia pinnata* L. Pierre. *Biochem Physiol Pflanzen*. **176**: 218-227.

Solaiman, A. R. M., and Habibullah, A. K. M. (1990). Responses of groundnut to rhizobium inoculation [in Bangladesh]. *Bangladesh Journal of Soil Science*, **21**.

Somado, E. A., Sahrawat, K. L., and Kuehne, R. F. (2006). Rock phosphate-P enhances biomass and nitrogen accumulation by legumes in upland crop production systems in humid West Africa. *Biology and Fertility of Soils*, **43**(1), 124-130.

Sorroche, F. G., Spesia, M. B., Zorreguieta, Á., and Giordano, W. (2012). A positive correlation between bacterial autoaggregation and biofilm formation in native *Sinorhizobium meliloti* isolates from Argentina. *Applied and environmental microbiology*, **78**(12), 4092-4101.

Sridevi, M., and Mallaiah, K. V. (2009). Phosphate solubilization by *Rhizobium* strains. *Indian journal of microbiology*, **49**(1), 98-102.

Stark, B. C., Dikshit, K. L., and Pagilla, K. R. (2011). Recent advances in understanding the structure, function, and biotechnological usefulness of the hemoglobin from the bacterium *Vitreoscilla*. *Biotechnology letters*, **33**(9), 1705-1714.

Stefan, M., Munteanu, N., and Dunca, S. (2012). PLANT-MICROBIAL INTERACTIONS IN THE RHIZOSPHERE-STRATEGIES FOR PLANT GROWTH-PROMOTION. *Analele Stiintifice ale Universitatii "Alexandru Ioan Cuza" din Iasi Sec. II a. Genetica si Biologie Moleculara*, **13**(1), 87-96.

Stowers Mark D. (1985). Carbon Metabolism In *Rhizobium* Species. *Ann. Rev. Microbiol.* **39**:89-108.

Tahir, M., and Sarwar, M. A. (2013). Plant Growth Promoting Rhizobacteria (PGPR): A Budding Complement of Synthetic Fertilizers for Improving Crop Production. *Group*.

Taiz, L., Zeiger, E. (2010). *Plant Physiology*, 5th ed. Sinauer Associates, Inc. U.S.A. pp 354-357.

Tapia, J., Munoz, J., Gonzalez, F., Blazquez, M., Malki, M., and Ballester, A. (2009) Extraction of extracellular polymeric substances from the acidophilic bacterium *Acidiphilium* 3.2 Sup (5). *Water Sci Technol* **59**: 1959–1967.

Thies JE, Singleton PW, Bohlool BB (1991) Influence of the size of indigenous rhizobial populations on establishment and symbiotic performance of introduced rhizobia on field grown legumes. *Appl Environ Microbiol* **57**:19–28

Tiessen, H. (2008). Phosphorus in the global environment. In *The ecophysiology of plant-phosphorus interactions* (pp. 1-7). Springer Netherlands.

Togay, N., Togay, Y., Cimrin, K. M., and Turan, M. (2008). Effects of rhizobium inoculation, sulfur and phosphorus applications on yield, yield components and nutrient uptakes in chickpea (*Cicer arietinum* L.). *African Journal of Biotechnology*, **7**(6).

Toyama H, Furuya N, Saichana I, Ano Y, Adachi O, Matsushita K (2007) Membrane-bound, 2-keto D-gluconate-yielding D-gluconate dehydrogenase from

Gluconobacter dioxyacetonicus IFO 3271, molecular properties and gene disruption. *Appl Environ Microbiol* **73**:6551–6556

Unge, A., Tombolini, R., Davey, M.E., de Bruijn, F.J., Jansson, J.K., (1998) GFP as a marker gene. In: Akkermans, A.D.L., Van Elsas, J.D., de Bruijn, F.J. (Eds.), *Molecular Microbial Ecology Manual*. Kluwer Academic Publishers, Dordrecht, pp. 6.1.13 1 – 6.1.13 16.

Upadhyaya, C. P., Akula, N., Young, K. E., Chun, S. C., Kim, D. H., & Park, S. W. (2010). Enhanced ascorbic acid accumulation in transgenic potato confers tolerance to various abiotic stresses. *Biotechnology letters*, **32**(2), 321-330.

Valentine, A. J., Benedito, V. A., Kang, Y. (2011). Legume nitrogen fixation and soil abiotic stress: from physiology to genomics and beyond. *Annual Plant Reviews* **42**, 207-248.

Valverde, A., Burgos, A., Fiscella, T., Rivas, R., Velazquez, E., Rodríguez-Barrueco, C. and Igual, J. M. (2006). Differential effects of coinoculations with *Pseudomonas jessenii* PS06 (a phosphate-solubilizing bacterium) and *Mesorhizobium ciceri* C-2/2 strains on the growth and seed yield of chickpea under greenhouse and field conditions. *Plant and soil*, **287**(1-2), 43-50.

Van Kessel, C., and Hartley, C. (2000). Agricultural management of grain legumes: has it led to an increase in nitrogen fixation?. *Field Crops Research*, **65**(2), 165-181.

van Rossum, M. W., Alberda, M., and van der Plas, L. H. (1997). Role of oxidative damage in tulip bulb scale micropropagation. *Plant Science*, **130**(2), 207-216.

Van Schie, B. J., De Mooy, O. H., Linton, J. D., Van Dijken, J. P., and Kuenen, J. G. (1987). PQQ-dependent production of gluconic acid by *Acinetobacter*, *Agrobacterium* and *Rhizobium* species. *Journal of general microbiology*, **133**(4), 867-875.

Van Schie, B. J., Van Dijken, J. P., and Kuenen, J. G. (1989). Effects of growth rate and oxygen tension on glucose dehydrogenase activity in *Acinetobacter calcoaceticus* LMD 79.41. *Antonie van Leeuwenhoek*, **55**(1), 53-65.

Vanbleu, E., Marchal, K. and Vanderleyden, J. (2004) Genetic and physical map of the pLAFR1 vector. *DNA Seq.* **15**(3), 225-227

Vance, C. P. (2001). Symbiotic nitrogen fixation and phosphorus acquisition. Plant nutrition in a world of declining renewable resources. *Plant physiology*, **127**(2), 390-397.

Vassilev, N., Nikolaeva, I., and Vassileva, M. (2007)b. Indole-3-acetic acid production by gel-entrapped *Bacillus thuringiensis* in the presence of rock phosphate ore. *Chemical Engineering Communications*, **194**(4), 441-445.

Vassilev, N., Nikolaeva, I., Jurado, E., Reyes, A., Fenice, M., and Vassileva, M. (2008). Antagonistic effect of microbially-treated mixture of agro-industrial wastes and inorganic insoluble phosphate to *Fusarium* wilt disease. *Progress in environmental microbiology*. Nova Publishers, USA, 223-234.

Vassilev, N., Requena, A. R., Nieto, L. M., Nikolaeva, I., and Vassileva, M. (2009). Production of manganese peroxidase by *Phanerochaete chrysosporium* grown on medium containing agro-wastes/rock phosphate and biocontrol properties of the final product. *Industrial Crops and Products*, **30**(1), 28-32.

Vassilev, N., Vassileva, M., and Nikolaeva, I. (2006). Simultaneous P-solubilizing and biocontrol activity of microorganisms: potentials and future trends. *Applied microbiology and biotechnology*, **71**(2), 137-144.

Vassilev, N., Vassileva, M., Bravo, V., Fernández-Serrano, M., and Nikolaeva, I. (2007)a. Simultaneous phytase production and rock phosphate solubilization by *Aspergillus niger* grown on dry olive wastes. *Industrial Crops and Products*, **26**(3), 332-336.

Vazquez, P., Holguin, G., Puente, M. E., Lopez-Cortes, A., and Bashan, Y. (2000). Phosphate-solubilizing microorganisms associated with the rhizosphere of mangroves in a semiarid coastal lagoon. *Biology and Fertility of Soils*, **30**(5-6), 460-468.

Vela'zquez E, Garcí'a-Fraile P, Ramí'ez-Bahena MH, Rivas R, Martí'nez-Molina E (2010) Bacteria involved in nitrogen-fixing legume symbiosis: current

taxonomic perspective. In: Khan MS et al (eds) *Microbes for legume improvement*. Springer, Heidelberg, pp 1–25

Velterop, J. S, Sellink, E., Meulenberg, J. J., David, S., Bulder, I., Postma, P. W. (1995) Synthesis of pyrroloquinoline quinone in vivo and in vitro and detection of an intermediate in the biosynthetic pathway. *J Bacteriol* **177**:5088–5098

Verma, J. P., Yadav, J., Tiwari, K. N., and Kumar, A. (2013). Effect of indigenous *Mesorhizobium* spp. and plant growth promoting rhizobacteria on yields and nutrients uptake of chickpea (*Cicer arietinum*L.) under sustainable agriculture. *Ecological Engineering*, **51**, 282-286.

Vieira, R. F., Mendes, I. C., Reis-Junior, F. B., and Hungria, M. (2010). Symbiotic Nitrogen Fixation in Tropical Food Grain Legumes: Current Status. In *Microbes for Legume Improvement* (pp. 427-472). Springer Vienna.

Vikram A, Algawadi AR, Krishnaraj PU, Mahesh KKS (2007) Transconjugation studies in *Azospirillum* sp. negative to mineral phosphate solubilization. *World J Microbiol Biotechnol* **23**: 1333–1337

Vogler, A. P., Trentmann, S. T. E. F. A. N., and Lengeler, J. W. (1989). Alternative route for biosynthesis of amino sugars in *Escherichia coli* K-12 mutants by means of a catabolic isomerase. *Journal of bacteriology*, **171**(12), 6586-6592.

Vyas, P., and Gulati, A. (2009). Organic acid production in vitro and plant growth promotion in maize under controlled environment by phosphate-solubilizing fluorescent *Pseudomonas*. *BMC microbiology*, **9**(1), 174.

Wakabayashi, S., H. Matsubara, and D.A.Webster. 1986. Primary sequence of dimeric bacterial haemoglobin from *Vitreoscilla*. *Nature* **322**: 481-483.

Walker, T. S., Bais, H. P., Grotewold, E. and Vivanco, J. M. (2003) Root exudation and rhizosphere biology. *Plant Physiol.* **132**: 44-51.

Wang, P., Zhong, Z., Zhou, J., Cai, T., and Zhu, J. (2008). Exopolysaccharide biosynthesis is important for *Mesorhizobium tianshanense*: plant host interaction. *Archives of microbiology*, **189**(5), 525-530.

- Wang, Z., Xiang, L., Shao, J., Węgrzyn, A., Węgrzyn, G. (2006) Effects of the presence of ColE1 plasmid DNA in *Escherichia coli* on the host cell metabolism. *Microb Cell Fact* 5, 34. doi:10.1186/1475-2859-5-34.
- Wani PA, Khan MS, Zaidi A (2007) Synergistic effects of the inoculation with nitrogen fixing and phosphate-solubilizing rhizobacteria on the performance of field grown chickpea. *J Plant Nutr Soil Sci* 170:283–287
- Ward, J. T., Lahner, B., Yakubova, E., Salt, D. E., and Raghothama, K. G. (2008). The effect of iron on the primary root elongation of *Arabidopsis* during phosphate deficiency. *Plant physiology*, 147(3), 1181-1191.
- Webley, D. M., Duff, R. B. (1965) The incidence, in soils and other habitats of micro-organisms producing 2-ketogluconic acid. *Plant Soil* 22:307–313
- Wecksler, S. R., Stoll, S., Iavarone, A. T., Imsand, E. M., Tran, H., Britt, R. D., Klinman, J. P. (2010) Interaction of PqqE and PqqD in the pyrroloquinoline quinone (PQQ) biosynthetic pathway links PqqD to the radical SAM superfamily. *Chem Commun (Camb)*. 46 (37):7031-3.
- West, S. E., Schweizer, H. P., Dall, C., Sample, A. K., Runyen-Janecky, L. J. (1994) Construction of improved *Escherichia-Pseudomonas* shuttle vectors derived from pUC18/19 and sequence of the region required for their replication in *Pseudomonas aeruginosa*. *Gene* 148(1), 81-86
- Xavier, J. B., and Foster, K. R. (2007). Cooperation and conflict in microbial biofilms. *Proceedings of the National Academy of Sciences*, 104(3), 876-881.
- Yadav, B. K., and Tarafdar, J.C., (2007) Ability of *Emericella rugulosa* to Mobilize Unavailable P Compounds during Pearl Millet (*Pennisetum glaucum* L.) Crop under Arid Condition. *Indian Journal of Microbiology*, 41, (1), 57-63, ISSN 0046-8991.
- Yang Xue-Peng, Gui-Fang Zhong, Jin-Ping Lin, Duo-Bin Mao and Dong-Zhi Wei (2010) Pyrroloquinoline quinone biosynthesis in *Escherichia coli* through expression of the *Gluconobacter oxydans* pqqABCDE gene cluster. *J Ind Microbiol Biotechnol* 37:575–580.

- Yazdani, M., Bagheri, H., and Ghanbari-Malidarreh, A. (2011). Investigation the Effect of Biofertilizers, Phosphate Solubilization Microorganisms (PSM) and Plant Growth Promoting Rhizobacteria (PGPR) on Improvement of Quality and Quantity in Corn (*Zea mays* L.). *Advances in Environmental Biology*, 5(8), 2182-2185.
- Yu, X., Liu, X., Zhu, T. H., Liu, G. H., and Mao, C. (2011). Isolation and characterization of phosphate-solubilizing bacteria from walnut and their effect on growth and phosphorus mobilization. *Biology and Fertility of Soils*, 47(4), 437-446.
- Yum DY, Lee YP, Pan JG (1997) Cloning and expression of a gene cluster encoding three subunits of membrane-bound gluconate dehydrogenase from *Erwinia cypripedii* ATCC 29267 in *Escherichia coli*. *J Bacteriol* 179: 1796566-6572
- Zaman-Allah, M., Sifi, B., L'Taief, B., El Aouni, M. H., and Drevon, J. J. (2007). Rhizobial inoculation and P fertilization response in common bean (*Phaseolus vulgaris*) under glasshouse and field conditions. *Experimental Agriculture*, 43(1), 67-78.
- Zhan, H. J., Lee, C. C., and Leigh, J. A. (1991). Induction of the second exopolysaccharide (EPSb) in *Rhizobium meliloti* SU47 by low phosphate concentrations. *Journal of bacteriology*, 173(22), 7391-7394.
- Zou, X., Binkley, D., & Doxtader, K. G. (1992). A new method for estimating gross phosphorus mineralization and immobilization rates in soils. *Plant and Soil*, 147(2), 243-250.
- Zucca, S., Pasotti, L., Politi, N., De Angelis, M. G. C., and Magni, P. (2013). A standard vector for the chromosomal integration and characterization of BioBrick™ parts in *Escherichia coli*. *Journal of biological engineering*, 7(1), 1-13.