Science 13 October 2006:
Vol. 314. no. 5797, pp. 312 - 313
DOI: 10.1126/science.1130441

REPORTS

A Small Microbial Genome: The End of a Long Symbiotic Relationship?

Vicente Pérez-Brocal,[1,2] Rosario Gil,[1,2] Silvia Ramos,[1] Araceli Lamelas,[1,2] Marina Postigo,[3] José Manuel Michelena,[1,4] Francisco J. Silva,[1,2] Andrés Moya,[1,2] Amparo Latorre[1,2]*

Intracellular bacteria are characterized by genome reduction. The 422,434–base pair genome of *Buchnera aphidicola* BCc, primary endosymbiont of the aphid *Cinara cedri*, is ~200 kilobases smaller than the previously sequenced *B. aphidicola* genomes. *B. aphidicola* BCc has lost most metabolic functions, including the ability to synthesize the essential amino acid tryptophan and riboflavin. In addition, most retained genes are evolving rapidly. Possibly, *B. aphidicola* BCc is losing its symbiotic capacity and is being complemented (and might be replaced) by the highly abundant coexisting secondary symbiont.

[1] Institut Cavanilles de Biodiversitat i Biologia Evolutiva, Universitat de València, Apartado Postal 22085, 46071 València, Spain.
[2] Departament de Genètica, Universitat de València, Dr. Moliner, 50, 46100 Burjassot, València, Spain.
[3] Centro de Astrobiología (CSIC-INTA), Ctra. Ajalvir, km 4, 28850 Torrejón de Ardoz, Madrid, Spain.
[4] Departament de Zoologia, Universitat de València, Dr. Moliner, 50, 46100 Burjassot, València, Spain.