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From environment to man: is *Aeromonas* infection an accident or a stopover on the adaptation road?

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Abstract

The versatility of bacterial life-style involves adaptation to various niches. Adaptation to both open environment and human specific niches is a challenge. In an attempt to improvethe understanding of aeromonosis, we investigated characteristics in genetic diversity, population structure, mode of evolution, pathogenic behavior among a large collection (>200*Aeromonas*strains). We compared & discussed results to those obtained with the *Pseudomonas, Ocrobactrum*&*Agrobacterium* models.

Evolution has resulted in exceptionally high genetic diversity, from whichemerge some clusters with speciation in action and subsets of strains host-adapted and/or “disease-specialized”.A high number of rrn operon, the high proportion of strains harboring divergent rrsV3 region with frequent horizontal transfer events, argued in favor of highly adaptative capabilities. The concerted evolution as a mode of homogenization of copies in multigenic families is not efficient in aeromonads. It is hypothesized that i) sequence modifications among 16SrRNA gene copies provide a fine-tuning of the ribosome function to optimize bacterial niche fitness; ii) a high number of 16SrRNA gene copies &intragenomic heterogeneity could be involved in maintaining functional diversity of *Aeromonas*spp. in environment, animal and human microbiotae.We observed large virulence capabilities and diverse pathogenic behavior, from slightly to highly pathogenic. Several couples of strains, isolated from the same human sample, showed together a synergistic pathogenic behavior.

The adaptation to human could coincide with a speciation in action, which could be a major mechanism for the emergence of true pathogens besides the acquisition of specialized virulence factors and complex pathogenic behaviors.

Biography

After Pharmacy studies and an internship in clinical microbiology, Brigitte Lamy has completed her PhD at the age of 33 years from Claude BernardLyon I University. She is practitioner at the Montpellier academic hospital (clinical microbiology department) and PhD advisor at the CNRS UMR 5119 research department (Team Pathogens and Environments).She has published more than 20 papers.