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Contact 9th Meeting of the Swiss Microbial Ecology from simon.marechal@uzh.ch

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To Merlin Unternährer <merlin.unt@limnol.uzh.ch>

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Type of presentation:
Oral presentation

Title:
Low level of metabolic auxotrophies among environmental Pseudomonas isolates

Authors:
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Abstract (300 words maximum): :
There is increasing evidence that cross-feeding – the exchange of a metabolic product between individual cells – is common in bacteria. However, many studies on cross-feeding involve defined (and often engineered) laboratory study systems, while it is less clear how prevalent the exchange of metabolites is in natural communities.
Here, we used a collection of 320 Pseudomonas strains isolated from pond and soil habitats to quantify the frequency of amino acid auxotrophies. Auxotrophic strains are unable to produce a specific metabolite and thus become dependent on other strains to acquire the metabolite via cross-feeding. Our screen, involving defined agar minimal media in the presence or absence of specific amino acids, revealed very low frequencies of amino acid auxotrophy among pseudomonads. Specifically, we identified one strain with a histidine auxotrophy and six strains with unspecific auxotrophies, while all other strains were autonomous prototrophs. Follow-up experiments with mixed cultures revealed no clear evidence for cross-feeding. Finally, preliminary bioinformatic genome analysis point towards high metabolic versatility and amino acid prototrophy for most Pseudomonas strains. Taken together, our results show that environmental Pseudomonas strains seem to be predominantly generalists with a high level of metabolic autonomy and little engagement in cross-feeding.

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