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Cheese surface host complex microbiota, comprising fungi, bacteria and bacteriophages (phages). The latter are known to have a substantial impact on the dynamics of microbial ecosystems. However, to date, ecological roles of phages were mainly studied in natural ecosystems and in the human gut. The hypothesis of this work is that phages affect the microbial succession observed on the cheese surface during the ripening process. In order to explore this question, isolation and characterization steps represent the first objectives.

A first overview of the microbial diversity was obtained through a shotgun metagenomic study performed on the total DNA obtained from the rind of Epoisses cheese. This allowed to identify members of the *Pseudoalteromonas*, *Psychrobacter* and *Glutamicibacter* genera as the dominant bacteria.

Then, several bacteria-phages couples were targeted and isolated from the rind. A few phages infecting *Glutamicibacter*, *Psychrobacter*, *Brevibacterium* and *Leuconostoc* were obtained and characterized from a morphological (transmission electron microscopy) and genetic (genome sequencing) point of views. They all seem to be virulent, and belong to different families from the *Caudovirales* order, namely *Siphoviridae*, *Myoviridae* and *Podoviridae*. Moreover, one of them have a novel genetic organization, and may potentially expand the current classification.

Overall, phages targeting main bacterial genera were isolated (except for *Pseudoalteromonas*), suggesting that the diversity of phages is at least as important as the bacterial diversity in cheese.

This phage-bacteria collection isolated from the cheese surface will be useful for testing the hypothesis of an ecological role of phages in this ecosystem using synthetic ecology approaches. Ideally, dynamics of both phages and hosts will be monitored in real time within a cheese matrix, giving first clues of phage impact in this peculiar ecosystem. These results will be of importance for the cheese industry as they may help to reach unprecedented mastery of the ripening process.