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Introduction

The prolate headed *Lactococcus lactis* c2 phages are among the 3 most common species isolated in the dairy industry. It was previously believed that the c2 phage species showed a very narrow heat inactivation spectrum, many inactivated by traditional pasteurization treatment of cheese milk. We recently characterized the thermal inactivation of eight c2 phages [Marvig et al. (2011) Int. Dairy J. 21, 556-560] and showed that c2 phages had an inactivation span (8-log reduction) of at least 10°C from 70°C to 80°C.

Comparative genomics of c2 phages

We have recently sequenced five c2 phages using 454 Next Generation Sequencing Technology. The draft sequence was aligned in Figure 1 using the Artemis Comparison Tool. The published sequences of c2 and bIL67 were included in the comparison. The comparison showed that c2 phages like the 936 phages have conserved genomes.

Comparative genomics of c2 phages with different thermal inactivation

The phages P220 and P684 had identical host range (data not shown) and highly similar DNA sequence as seen from Figure 1 and Figure 2B. However, the two phages have different thermal inactivation as seen in Figure 2A. At 70°C for 5 min P220 was completely inactivated (8 log reduction) while P684 only had a 4.5 log reduction.

Is the late expressed L10 gene product involved in thermal stability?

When the genomes of P220 and P684 are compared the main difference in the structural part of the genome is a 93 bp deletion in the l10 gene homologue (Figure 3A). This gives a 31 a.a. deletion (Figure 3B).

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