

*Clostridium botulinum*  
Detection and characterization of virulence  
plasmids in *C. botulinum* group III isolates.

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Botulism is a disease that causes neuroparalysis in the organism poisoned by the Botulinum neurotoxin (BoNT) produced by the bacterium *Clostridium botulinum*. Botulism is generally thought of as foodborne intoxication, but there are four different forms of botulism. Foodborne botulism, wound botulism, infant botulism and intestinal colonisation of adults. Botulism does not only infest humans but animals as well. Cases of foodborne and intestinal colonisation of botulism have been related to animals.

In 2007 and 2008 there were a large number of suspected botulism outbreaks in avian populations in Sweden and this led to larger investigation in the field. Samples from dead birds were sent in for testing. Investigation of bacterial strains related to the outbreaks has led to an ongoing project, which indicates that the *C. botulinum* (group III) type C is carrying a set of plasmids referred to as pan-plasmidome, consisting of a group of plasmids circulating in the strains of *C. botulinum*. The aim of this study was to detect and characterise which set of plasmids different strains carry and under which conditions toxin was produced.

PFGE technique was used in the study, since large DNA sequences were analysed. Different optimizations were done to improve the resolution of the PFGE gels. PCR was used as a control to confirm that the fragments seen on the PFGE in fact were the same plasmids as earlier sequenced. Liver and caecum samples with mixed colonies were first tested with real time PCR and those established to have a high value for the BoNT gene were tested with conventional PCR.

The conclusion made was that strains analysed contain in part different sets of plasmids which strengthens the thesis that a pan-plasmidome exists among the species of *Clostridium*. A plasmid was seen on the PFGE that could be a not yet detected plasmid. BoNT was synthesised in all conditions which indicate that if infected or exposed to the bacteria the risk of getting the disease could be quite high. Another toxin, C2 was not synthesised under any conditions. This could be because the medium lacked some critical component needed for C2 synthesis. Testing on mixed samples gave negative results. Altogether interesting results were found but further testing needs to be made to discover even more about the bacterium and the disease it causes.

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