

Weakly hemolytic *Brachyspira hyodysenteriae* strains in pigs

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Abstract

Infections with *Brachyspira* species in swine occur in most swine-rearing countries and can result in substantial economic losses. Of all swine-associated *Brachyspira* species infections, classical swine dysentery, caused by *Brachyspira hyodysenteriae*, results in the most severe clinical symptoms (1). The strongly hemolytic species *B. hyodysenteriae*, “*B. suanatina*” and “*B. hamptonii*” are considered to be more pathogenic for pigs than the weakly hemolytic species *B. intermedia*, *B. innocens* and *B. murdochii* (2, 3). This led to the assumption that the degree of hemolysis may be linked with the virulence of a species.

This study aims to compare the hemolytic capacity of different *B. hyodysenteriae* strains, to relate the degree of hemolysis to the pathogenic potential and to identify the underlying molecular differences. Hemolysis of ten *B. hyodysenteriae* strains was quantified in an *in vitro* assay for hemolytic capacity in which supernatant of each strain was incubated with a 10% porcine red blood cell suspension where after absorption was measured (4). Complete sequences of the hemolysis associated genes *hlyA*, *tlyA*, *tlyB* and *tlyC* were determined for all *B. hyodysenteriae* strains. The virulence of a weakly and a strongly hemolytic *B. hyodysenteriae* strain were compared in experimentally infected pigs (5).

Hemolysis of the *B. hyodysenteriae* strains varied from near absence to pronounced hemolysis. One weakly hemolytic *B. hyodysenteriae* strain showed amino acid substitutions in *tlyA* and *tlyB* and, in contrast to a strongly hemolytic strain, proved to be low pathogenic in experimentally infected swine.

This study points out that the degree of hemolysis and the virulence of *B. hyodysenteriae* strains can vary and that weakly hemolytic *B. hyodysenteriae* strains can be found in fecal samples of swine. The appearance of weakly hemolytic, low virulent strains of *B. hyodysenteriae* is problematic for swine industry since they may affect herd dysentery status, thus compromising trading opportunities.

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