Moellerella wisconsensis: what’s its role in cattle disease?

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Abstract
Since its first description in 1984, Moellerella wisconsensis has been occasionally isolated from clinical specimens but its pathogenic role remains unclear. This paper reports the first isolation of Moellerella wisconsensis from the liver and kidney tissues in a cow in Portugal, and represents the fifth isolation of this microorganism from non-human sources reported in the literature. Further studies are needed for the clarification of the role of this microorganism as a pathogenic agent.

Introduction
Moellerella wisconsensis is a Gram negative bacillus, belonging to the family Enterobacteriaceae, described for the first time in 1984 (Hickman-Brenner et al. 1984). This bacterium has been isolated from stool samples of patients with diarrhea (Hickmann-Brenner et al. 1984, Marshall et al. 1986, Quevedo et al. 2003) but also from other clinical samples such as gallbladder tissue (Wittke et al. 1985, Ohanessian et al. 1987), bronchial aspirate (Wallet et al. 1994), bile (Aguilar et al. 2004) and blood (Aller et al. 2009, Cardentey-Reyes et al. 2009). Besides its recovering from human samples, this bacterium has also been recovered from animal samples, human food and water (Hickman-Brenner et al. 1984, Bangert et al. 1988, Sandfort et al. 2002, Stock et al. 2003, Casalinuovo et al. 2009, Coton et al. 2013). The pathogenic power of M. wisconsensis is poorly known. Notwithstanding, its recovering from clinical specimens’ raises some questions about its pathogenic role. This paper describes a case of M. wisconsensis isolation from the liver and the kidney tissues in an adult cow from Alentejo region, Portugal.

Materials and Methods
Case report
In a meat producing herd, located at the county of Portel - southeast of Portugal (38.3°N7.58°W), a ten years old cow developed a fetid bloody diarrhea, depression and progressive anorexia. Four weeks after the onset of the signs the animal died. Post-mortem findings revealed hemorrhagic intestinal mucosa, enlarged mesenteric lymph nodes, generalized jaundice and enlarged liver. A fragment of liver and kidney were sampled and placed into sterile containers in cold boxes for transport to the laboratory (Laboratory of Microbiology – Escola Universitária Vasco da Gama).

Bacteriological examination
Specimens were cultured on MacConkey agar (Oxoid®) and Columbia blood agar (bioMérieux®). The plates were incubated aerobically at 36±1°C in aerobic atmosphere for 24 hours. The hemolytic phenotype was determined visually on Columbia blood agar. Nextly, a Gram staining was performed to characterize the colonies and other biochemical tests, e.g. oxidase test and the inoculation of the API identification gallery (bioMérieux®), allowed the biochemical identification of the microorganism.

Results
After 24 hours of incubation, a pure culture of small, grey and alpha hemolytic colonies were observed on Columbia Blood Agar (bioMérieux®) These colonies were lactose positive on MacConkey agar (Oxoid®) and Columbia blood agar (bioMérieux®). The plates were incubated aerobically at 36±1°C in aerobic atmosphere for 24 hours. The hemolytic phenotype was determined visually on Columbia blood agar. Nextly, a Gram staining was performed to characterize the colonies and other biochemical tests, e.g. oxidase test and the inoculation of the API identification gallery (bioMérieux®), allowed the biochemical identification of the microorganism.

Discussion and Conclusions
M. wisconsensis is a Gram negative enterobacterium described for the first time in 1984 (Hickman-Brenner et al. 1984). Because of its rare isolation in clinical samples, its role as a pathogen remains unclear (Ohanessian et al. 1987, Aguilar et al. 2004). However, M. wisconsensis has been isolated in cases of hemorrhagic diarrhea in humans (Hickman-Brenner et al. 1984). Furthermore, the recovering of this microorganism from other clinical conditions such as gallbladder infections or acute cholecystitis should not be neglected and its ability to cause disease should be investigated. Belonging to Enterobacteriaceae family, its natural habitat is the gut and water is a probable source of infection, especially if no chlorinated (Hickman-Brenner et al. 1984).

In this case, the tissues culture yielded a microorganism identified as M. wisconsensis and no other microorganisms were isolated.

To our best knowledge this is the fifth report of isolation of this bacterium in non-human samples and the first reported in Portugal. Although we cannot associate this bacterium to the clinical signs presented by the animal due to the lack of information about its virulence, we hope that this report will stimulate the investigation to clarify about the role of this microorganism as a pathogenic agent.

References


