The sporadic isolation of an organism resembling Pasteurella haemolytica, associated with focal necrotic pneumonia combined with pleuritis, arthritis and septicaemia, was described by Bertschinger and Seifert (1979). Infections with this Pasteurella-like agent do not seem to be of substantial economic importance, contrary to Haemophilus pleuropenumoniae infections, although both pathol odological findings show striking similarities.

A study on the DNA base sequence relationship (Madaclan et al., 1980) among strains of the genus Actinobacillus, Haemophilus and Pasteurella reveals that H. pleuropenumoniae (syn. Haemopneumoniales) and the Pasteurella-like organism are closely related and, with the exception of the k-motor requirement of H. pleuropenumoniae, there are no phenotypic differences.

On the basis of these findings we performed a number of comparative studies with the exception of NAD requirement, the two strains cannot be distinguished biochemically. Some major biochemical properties are shown in Table 1.

Table 1: Comparison of the major phenotypic features of H. pleuropenumoniae and Pasteurella-like organism

<table>
<thead>
<tr>
<th>Feature</th>
<th>H. pleuropenumoniae</th>
<th>Pasteurella-like</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAD requirement</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Heterolysin (Sheep blood)</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Urease</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mucinol</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Sensitivity to Penicillin</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

A further difference may be observed in the consistency of the colonies. While H. pleuropenumoniae is known to form a sticky colony on the classical growth media, the colony of the Pasteurella-like organism is mostly smooth and does not adhere to the plate medium, as shown on an agar (Niclot, 1972) and show on young culture a bright iridescence, suggesting the presence of a capsular component.

In a serological investigation it was found that both strains belong to the capsular type 2, according to the serological classification of H. pleuropenumoniae (Kilian et al., 1980). The specificity was confirmed by adsorption assays. Serotype 2 is known to be prevalent in Switzerland, and all Pasteurella-like strains were isolated so far in the routine diagnostic belonged to this serotype. It is, however, likely that other serotypes too occur in Pasteurella-like strains.

The scanning profiles of the proteic pattern of SDS-solubilized cell proteins (Niclot et al., 1980) of the two strains, obtained after polyclarilamide gel electrophoresis, showed a striking similarity.

To complete our comparative study, we performed an experimental infection on a 12 weeks old crossbred piglet. We infected intramuscularly 1.7 x 10⁸ Pasteurella-like organisms or strain 419 (6 h culture suspended in saline).

The course of the infection was highly comparable with that observed after administration of a high dose of H. pleuropenumoniae. After 6 to 7 hours, the piglet showed severe respiratory distress with fever (41.3°C) and blood tinged vomiting. After a period of seeming amelioration, the animal died 36 hours after inoculation. The necropsy revealed the typical lesions of pneumonia and pleuritis seen in H. pleuropenumoniae infections. The inoculated strains could be implicated in the sequence of events from the lung and the bronchi.

Furthermore we infected 4 piglets with 5.3 x 10⁸ Pasteurella-like organisms of the same strains (48 h. old culture) in order to follow the immunohological reaction. The pigs showed only mild respiratory symptoms and recovered rapidly. A blood sample taken 10 days later gave, for all piglets, evidence of an increased complement-fixing antibodies to a titre of 1:20 to 1:40, irrespective of the antigen used (inoculated Pasteurella-like strain or H. pleuropenumoniae serotype 2).

The results obtained in the different investigated systems confirm the similarities of the two strains. This fact must be considered in the bacteriological diagnosis of pleuropenumonia in pigs, and the same control measures have to be applied also with NAD-independent isolates.

In field conditions, however, NAD-dependent strains (H. pleuropenumoniae) surprisingly caused much more frequently infections and a much severer course of infection than NAD-independent strains. This may point out a more marked virulence of H. pleuropenumoniae, the factor of which is not yet defined but may be in relation with its deficiency to synthesize NAD.

Until more specific statistical data on the spread of infection with both varieties of strains are available, there is to be attached equal etiological importance to both agents. Further bacteriological work on this subject is required and additional experimental data have to be gathered in order to assess the real practical implication of the infection with one or the other kind of strain.

Selected references: