**PASTEURELLACEAE**

****

****

**Instructor**

**Dr. Maytham Ihsan**

**Ph.D Vet Microbiology**

**GENERAL CHARACTERISTICS**

* *Pasteurella* and *Mannheimia* species are small (0.2 × 1–2 μm), non-motile, Gram-negative rods or coccobacilli.
* They are oxidase-positive facultative anaerobes, and most species are catalase positive.
* They grow best on media supplemented with blood or serum.
* *Mannheimia haemolytica* can tolerate the bile salts in MacConkey agar.
* IMPORTANT: pasteurellae exhibit **bipolar staining** In smears from infected blood or tissues stained by the Giemsa method.
* The family *Pasteurellaceae* comprises 15 genera, seven of which contain organisms of veterinary importance.
* Five **capsular antigens** A, B, D, E and F (into Letters) and at least 11 **somatic LPS antigens** (into Numbers)have been identified.
* **Carter**, is the first who was classify Pasteurellae.



Bipolarity staining in blood & tissue samples

**Usual habitat**

* Most *Pasteurella* and *Mannheimia* species are commensals on the mucosae of the upper respiratory tract of animals.
* Their survival in the environment is relatively short.

**Differentiating features of *Pasteurella multocida* and *Mannheimia haemolytica***

|  |  |  |
| --- | --- | --- |
| ***M. haemolytica*** | ***P. multocida*** | **Feature** |
| **Haemolytic** | **Non-haemolytic** | **Haemolysis on sheep blood agar** |
| **Grow with pin point colonies** | **No growth** | **Growth on MacConkey Agar** |
| **-** | **+** | **Sweetish odor colonies** |
| **-** | **+** | **Indole production** |
| **-** | **+** | **Lactose fermentation** |

**Virulence Factors of *Pasteurellae***

1. Capsule
2. Fimbriae
3. Surface fibrils & filamentous haemagglutinins

4) PMT toxin, a cytotoxic protein

**Diseases caused by P. multocida & M. haemoltica**

***P. Multocida* carter B (TYPE B)**

* Haemorrhagic septicaemia (Asia) / Cattle & buffaloes

***P. Multocida* carter E (TYPE E)**

* Haemorrhagic septicaemia (Africa) / Cattle & buffaloes

***P. Multocida* carter A (TYPE A)**

**- Associated with Pneumonic Pasteurellosis ((Shipping Fever))**

**- Fowl Cholera**

***P. Multocida* carter F (TYPE F)**

* Fowl Cholera

***M. Haemolytica***

* Bovine pneumonic pasteurellosis **((shipping fever))** in Cattle
* Gangrenous mastitis in Sheep

**DIAGNOSIS**

- A history of exposure to stress arising from transportation or overcrowding.

* Suitable specimens for laboratory examination from live animals include

-tracheobronchial aspirates nasal swabs

-Mastitic milk.

-Tissue or blood smears from septicaemic cases, stained by **Giemsa or Leishman** methods, may reveal large numbers of **bipolar-staining** organisms.

* Specimens should be cultured on blood agar and MacConkey agar. Plates are incubated aerobically at 37°C for 24 to 48 hours.
* Blood agar, supplemented with neomycin, bacitracin and antifungal, can be used for the isolation of *P. multocida* from heavily contaminated specimens.

Identification criteria for isolates:

– Colonial characteristics

– Growth on MacConkey agar

– Positive oxidase test

– Biochemical profile

– PCR-based methods for the identification of colonies phenotypically suggestive of *Pasteurella* or *Mannheimia* species.