# Moraxella catarrhalis

Moraxella catarrhalis is a gram-negative diplococci, which is oxidase-positive and catalase-positive. It can lead to otitis media in children, along with sinusitis. It is the second most common bacterial cause of COPD exacerbation in adults, and can lead to bronchitis. This bacterium is also responsible for laryngitis in patients. Moraxella catarrhalis can be treated with amoxicillin-clavulanate, trimethoprim-sulfamethoxazole, extended-spectrum cephalosporins, macrolides, like azithromycin and clarithromycin, along with tetracyclines, and fluoroquinolones.




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## Characteristics

**Gram-Negative**
Graham-cracker Negative-devil
Moraxella Catarrhalis is gram negative, meaning it does not retain crystal violet stain. This is because it has a thin peptidoglycan layer, which is sandwiched between an inner cytoplasmic cell membrane and a bacterial outer membrane.

**Diplococci**
Double-cockeyes
Under microscopy, Moraxella catarrhalis exists as diplococci, or round bacteria (cocci) that typically occur in the form of two joined cells.

**Oxidase-positive**
Positive Ox-daisy
This bacterium is oxidase-positive, meaning it can produce cytochrome c oxidase, an enzyme of the bacterial electron transport chain. This means Moraxella catarrhalis can use oxygen as a terminal electron acceptor in respiration.

**Catalase-positive**
Positive-cat
Moraxella is catalase-positive. This means that it catalyzes the decomposition of hydrogen peroxide to water and oxygen, which is important for preventing oxidative damage by reactive oxygen species.

## Associated Infections

**Otitis Media**
Oats-out-of-Ear
This bacterium is a common cause of otitis media in children.

**Sinusitis**
Sinner
Adults and children may be colonized with Moraxella catarrhalis, and can develop sinusitis because of this bacteria. This is more commonly seen in children.

**Chronic Obstructive Pulmonary Disease (COPD)**
Crone Lungs Diseased
Moraxella catarrhalis is the second most common cause of bacteria-induced COPD exacerbation. The most common cause is H. influenzae.

**Bronchitis**
Broccoli-on-fire
When the bronchi in the lungs become inflamed, this leads the patient to suffer irritation in the form of coughing that often produces mucus. In addition, patients may suffer from chest pain, shortness of breath, and wheezing. This is referred to as bronchitis and decreases expiratory airflow in patients.

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Important to note, bronchitis is further specified as either acute or chronic. Chronic bronchitis is one of the lung diseases included in the umbrella term of COPD, in addition to emphysema. <br>

**Laryngitis**

Larynx-on-fire

Patients can also develop laryngitis due to Moraxella catarrhalis infection, which is one of the most common bacterial causes of laryngitis. This is more common in adults, but children can also be affected.

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