

# Struktur & Funktion des Atmungsapparates der Vögel

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## Respirationstrakt

- 1. Nasenhöhle**
  - Nasenmuscheln
  - Sinus infraorbitalis
- 2. Larynx**
- 3. Trachea**
- 4. Syrinx**
- 5. Lunge**
  - Bronchien
  - Gasaustauschendes Gewebe
- 6. Luftsäcke**

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## Mund-Rachenhöhle/Oropharynx

Mundhöhlendach

Choana

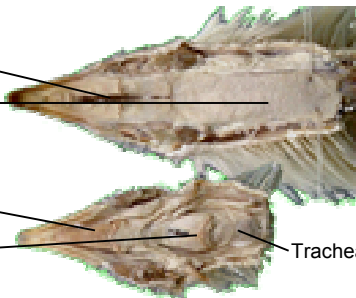
Oesophagus

Mundhöhlenboden

Zunge

Kehlkopfberg

Trachea



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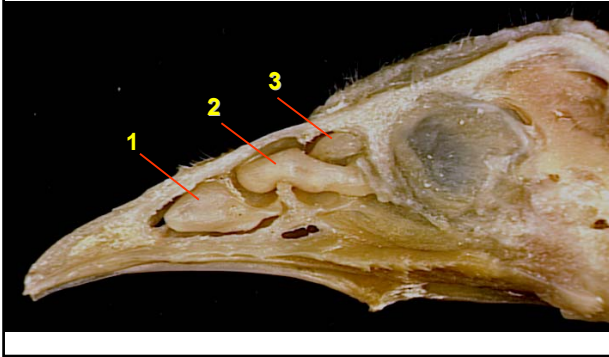
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## Nasenmuscheln



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## Nasenhöhle

- 1 Vordere Nasenmuschel
- 2 Mittlere Nasenmuschel
- 3 Hintere Nasenmuschel

NSS, 1992, Bd. V, S. 161

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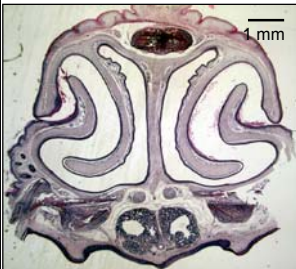
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## Rostrale Nasenmuschel

### Vorhofsregion

Mehrschichtiges Plattenepithel



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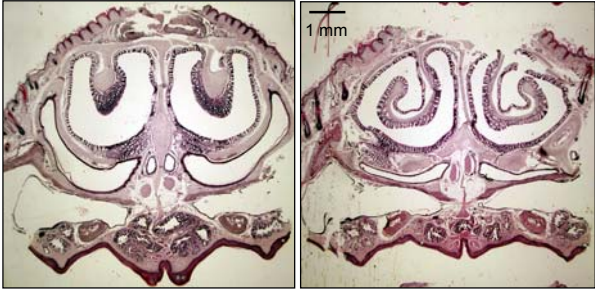
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## Mittlere Nasenmuschel

### Atmungsregion

Respiratorisches Epithel



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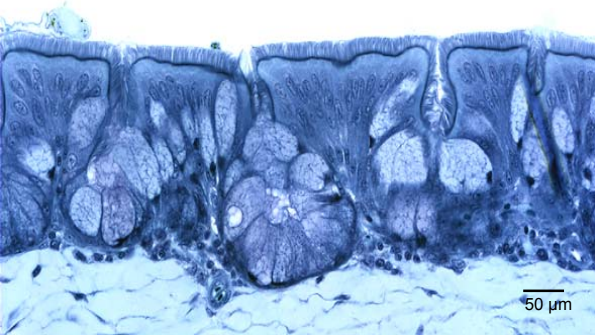
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### Mehrschichtiges flimmerndes Zylinderepithel mit Becherzellen



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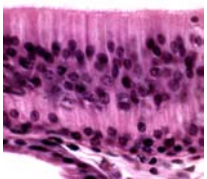
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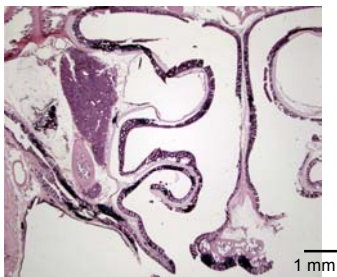
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## Kaudale Nasenmuschel

### Olfaktorische Region



Nasendrüse  
Sinus infraorbitalis



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## Sinus infraorbitalis

Dreieckiger Hohlraum direkt unter der Haut rostroventral des Auges



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## Wasser- & Thermoregulation

Steigende Temp.

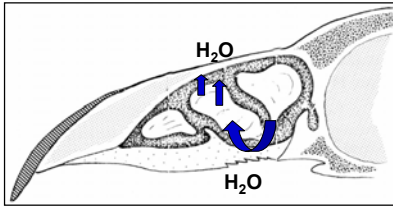


Wassersättigung



70 % des Wassers

rückgewonnen bei 20 °C



Sinkende Temp.



Kondensation



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## Funktion

**Filtration – Reinigung**

**Olfaction**

**Thermoregulation**

Ökonomie von Wasser & Wärme

Nasenmuscheln als Wärmeaustauscher

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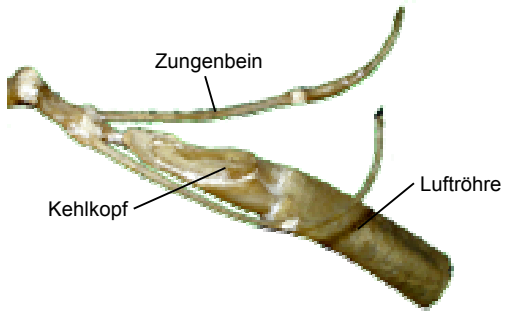
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## Larynx



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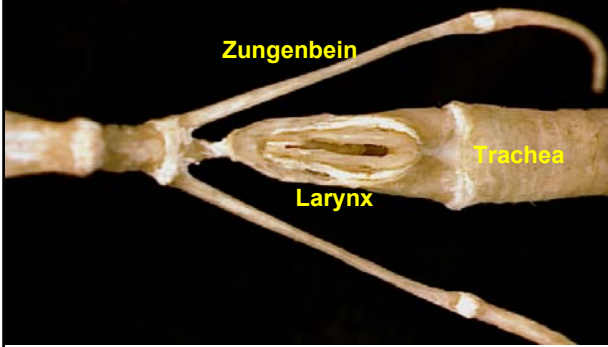
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## Larynx



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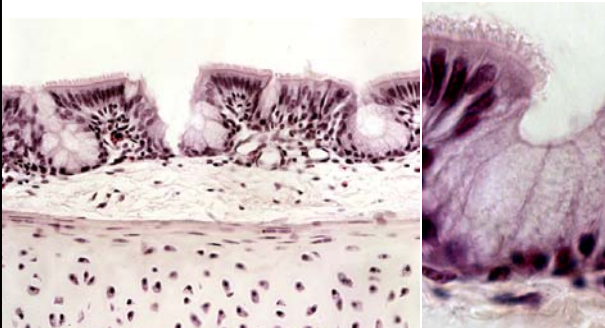
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## Mehreihiges Epithel mit Becherzellen & intraepithelialen Drüsen



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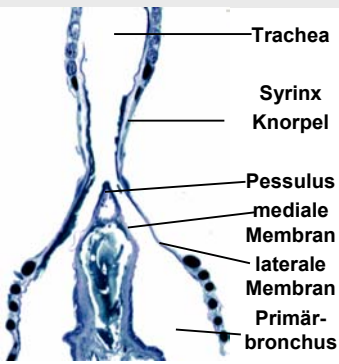
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## Syrinx



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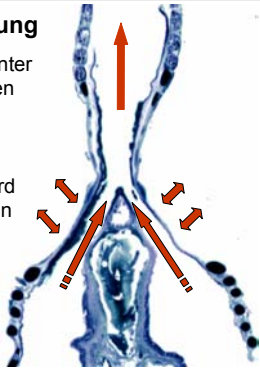
## Funktion des Syrinx

### Stimmbildung

Luft strömt hinter die elastischen Membranen

Vibration

Spannung wird durch Muskeln geregelt



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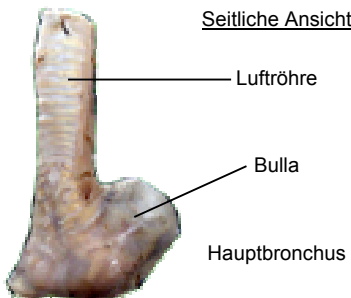
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## Stimmkopf eines Erpels

Seitliche Ansicht



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## Lunge



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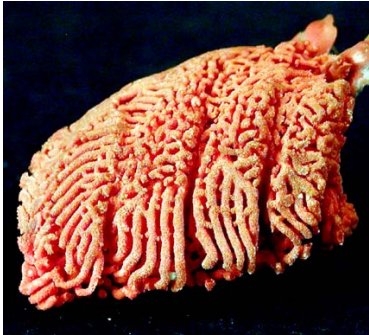
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## Bronchien

Cast - Seitenansicht



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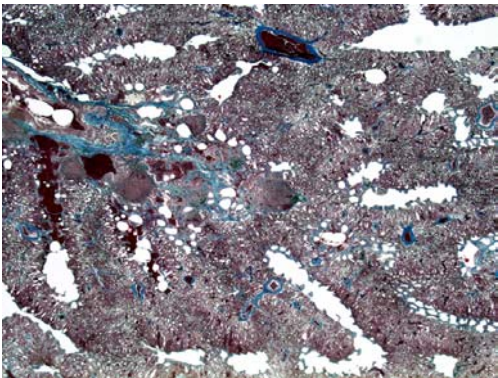
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## Lungengewebe



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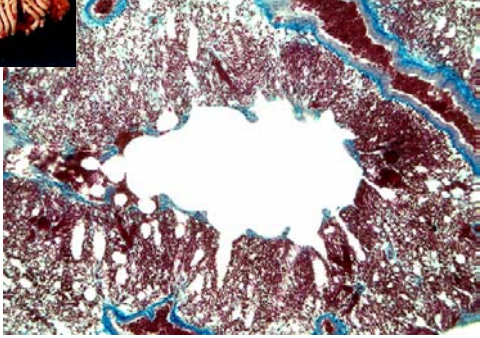
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## Parabronchen



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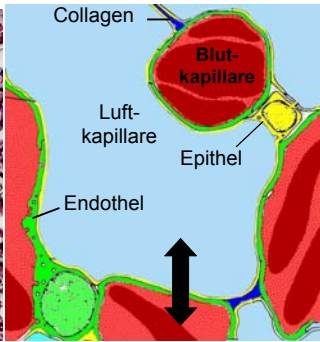
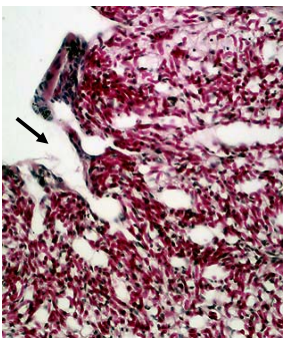
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## Ort des Gasaustausches



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## Äußere Atmung



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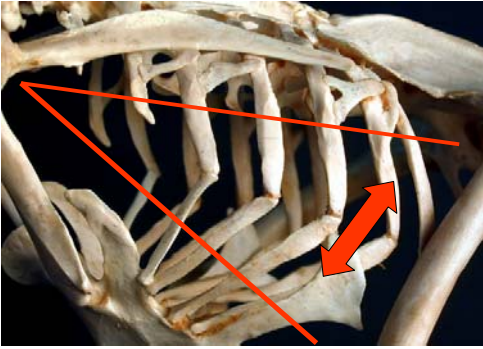
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## „Blasebalg“



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## Charakteristika

- Nasenhöhle als thermoregulatorisches System
- Lange flexible Trachea
- Syrinx
- Konstantes Lungenvolumen
- Blasebalg-Aktion der Luftsäcke

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## Charakteristika

- Kontinuierlicher Luftstrom
- Gasaustausch im Gegenstrom
- Hohe anatomische Diffusionskapazität
- **Hocheffizientes Gasaustauschsystem**

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