

## Structure of nasal and oral cavities in the protoceratopsid dinosaurs (Ceratopsia, Ornithischia)

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Snout is very deep and laterally compressed in the Protoceratopidae. Oral cavity is highly vaulted longitudinally and transversely. It wedges into the middle of the nasal chamber dorsally causing that ventral portion of the latter parallels oral cavity on both its sides. Fenestra exchoanalis is oriented almost vertically, opening on the side of the oral cavity. Structure of the snout and hard palate results in narrowing and deepening of the nasal passage, thus inhaled air passed close to large surface of the mucosa-covered walls of the nasal cavity. Blood cooling effect of that narrow air passage may have been significant in the Protoceratopsidae. Choana opened well in front of the entrance to larynx: separation of feeding from breathing was not complete, although extensive.

**Key words:** Dinosauria, Protoceratopidae, nasal cavity, oral cavity, anatomy, thermoregulation.

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