The Paranasal Air Sinuses of Predatory and Armored Dinosaurs (Archosauria: Theropoda and Ankylosauria) and Their Contribution to Cephalic Structure

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citation:

WitmerLab web page with downloads of movies and 3D PDFs: http://www.oucom.ohiou.edu/dbms-witmer/DinoSinuses_main.htm
Fig. 1. Paranasal sinuses and other cephalic components of a human (*Homo sapiens*, OUVC 10503) based on CT scanning followed by segmentation and 3D visualization. Bone is rendered semitransparent. **A**: Left anterodorsolateral view. **B**: Anterior view. **C**: Left lateral view. **D–G**: isolated paranasal sinuses. **D**: Left anterodorsolateral view corresponding to **A**. **E**: Anterior view corresponding to **B**. **F**: Dorsal view. **G**: Left lateral view corresponding to **C**. The paratympanic sinuses and endosseous labyrinth are also visualized. Scale bars = 2 cm.
Fig. 2. Diagram of phylogenetic relationships of the taxa mentioned in the text. The focal taxa are indicated in boldface type. Topology derives from Hill et al. (2003), Holtz et al. (2004), Vickaryous et al. (2004), Bininda-Emonds et al. (2007), and Livezey and Zusi (2007).
Fig. 3. Paranasal sinuses and other cephalic components of an American alligator (*Alligator mississippiensis*, OUVC 9761) based on CT scanning followed by segmentation and 3D visualization. Bone is rendered semitransparent. **A:** Left lateral view. **B:** Left rostrodorsolateral view. **C:** Dorsal view. **D:** Ventral view. Scale bars = 2 cm.
Fig. 5. Paranasal sinuses and other cephalic components of *Majungasaurus crenatissimus* (FMNH PR2100) based on CT scanning followed by segmentation and 3D visualization. Bone is rendered semitransparent (except in C), as is the nasal cavity (airway and olfactory region). A: Left lateral view. B: Left rostro dorsolateral view. C: Skull in left lateral view. D: Ventral view. E: Rostral view. F: Dorsal view. Scale bars = 5 cm.
Fig. 6. Paranasal sinuses and other cephalic components of *Tyrannosaurus rex* (skull based on FMNH PR2081; soft-tissue components from several specimens, see text) based on CT scanning followed by segmentation and 3D visualization. Bone is rendered semitransparent (except in D), as is the nasal cavity (airway and olfactory region). A: Left lateral view. B: Rostral view. C: Left rostrodorsolateral view. D: Skull in left lateral view. E: Dorsal view. F: Ventral view. G: Right side of sagittally sectioned head in medial view. Scale bars = 20 cm.