CT DATA PARAMETERS, 3D MODELISATION, SOFTWARES

CT scanning of specimens MHNC 8372 (*Alcidedorbignya*, whole skeleton), MHNC 8399 (*Alcidedorbignya*, skull) and AMNH 16663 (*Pantolambda*, skull and isolated ectotympanic) were performed at the X-ray Tomography Imagery Platform AST-RX (Accès Scientifique à la Tomographie par Rayons X) of the MNHN, using a GE Sensing and Inspection Technologies phoenix|x-ray v|tome|x L240-180 CT scanner. Data processing was undertaken at the 3D imaging facilities Lab of the UMR 7207 CR2P (MNHN CNRS UPMC-Paris6). Mimics® Innovation Suite v.16 and v.17 (Materialise) and VG Studio Max 2.1 (Volume Graphics) were used for segmentation and 3D object rendering. Cinema 4D R15 and R16 64 bits (Maxon) was used for retrodeformation, parts assembling and final posing of the MHNC 8372 whole skeleton.

1. **MHNC 8372 (whole postcranial skeleton):** *Fig. 117, 118*
   4 scan were made with an isotropic voxel size of 0.06999972 mm under a voltage of 105 kV and a current of 600 µA. The data were reconstructed using phoenix datos|x® 2.0 reconstruction software then merged and exported into a 16 bits TIFF image stack of 4957 slices with Image J.

2. **MHNC 8372 (skull without mandible):** *Fig. 21, 22, 30, 32, 39, 46, 47, 54, 55, 57, 58, 117, 118*
   The scan was made with an isotropic voxel size of 0.03300054 mm under a voltage of 100 kV and a current of 250 µA. The data were reconstructed using phoenix datos|x® 2.0 reconstruction software and then exported into a 16 bits TIFF image stack of 1797 slices.

3. **MHNC 8372 (mandible):** *Fig. 59*
   The scan was made with an isotropic voxel size of 0.02789020 mm under a voltage of 100 kV and a current of 250 µA. The data were reconstructed using phoenix datos|x® 2.0 reconstruction software and then exported into a 16 bits TIFF image stack of 1806 slices then binned with ImageJ into a 8 bits TIFF image stack of 904 slices with an isotropic voxel size of 0.0557800mm.

4. **MHNC 8372 (femur):** *Fig. 117, 118*
   Individual scan made after a new preparation of the isolated bone. The scan was made with an isotropic voxel size of 0.02755143 mm under a voltage of 85 kV and a current of 160 µA. The data were reconstructed using phoenix datos|x® 2.0 reconstruction software and then exported into a 16 bits TIFF image stack of 1888 slices.

5. **MHNC 8372 (vertebras in connection, C2-C5, T1-T3 and L7-L9):** *Fig. 117, 118*
   Individual scan of each group of vertebras made with a better resolution and contrast in order to facilitate virtual preparation. Each scan was made with an isotropic voxel size of 0.02302100 mm under a voltage of 90 kV and a current of 275 µA. The data were reconstructed using phoenix datos|x® 2.0 reconstruction software and then exported into a 16 bits TIFF image stack of 809 (C2-C5), 1033 (T1-T3) and 1216 (L7-L9) slices. Each group have been virtually prepared and retrodeformed in order to get individual and symmetrical vertebra for a correct articulation of the whole vertebral column.

6. **MHNC 8372 (articulated vertebrae, T4-T6, T7-T11, T12-T13-L1-L2 and L3-L5):** *Fig. 117, 118*
   Individual scan of each group of vertebras made with a better resolution and contrast in order to facilitate virtual preparation. The scan was made with an isotropic voxel size of 0.02429200 mm under a voltage of 95 kV and a current of 275 µA. The data were reconstructed using phoenix datos|x® 2.0 reconstruction software and then exported into a 16 bits TIFF image stack of 903 (T4-T6), 1239 (T7-T11), 1205 (T12-T13-L1-L2) and 1081 (L3-L5) slices. Each group have been virtually prepared and retrodeformed in order to get individual and symmetrical vertebra for a correct articulation of the whole vertebral column.

7. **MHNC 8399 (skull):** *Fig. 44, 45 (slice), 48, 51, 52*
   The scan was made with an isotropic voxel size of 0.02395037 mm under a voltage of 75 kV and a current of 319 µA. The data were reconstructed using phoenix datos|x® 2.0 reconstruction software and then exported into a 16 bits TIFF image stack of 1952 slices.

8. **AMNH 16663 (*Pantolambda* skull):** *Fig. 56*
   The scan was made with an isotropic voxel size of 0.07637792 mm under a voltage of 220 kV and a current of 347 µA. The data were reconstructed using phoenix datos|x® 2.0 reconstruction software and then exported into a 16 bits TIFF image stack of 844 slices.

9. **AMNH 16663 (*Pantolambda* ectotympanic):** *Fig. 126*
   The scan was made with an isotropic voxel size of 0.00521079 mm under a voltage of 65 kV and a current of 350 µA. The data were reconstructed using phoenix datos|x® 2.0 reconstruction software and then exported into a 16 bits TIFF image stack of 1000 slices.

CT scanning of specimens MHNC 8360 and MHNC 8419 (*Alcidedorbignya*, isolated petrosal bones) were performed at the Steinmann Institut für Geologie, Mineralogie und Paläontologie (Universität Bonn, Germany) using a GE Sensing and Inspection Technologies phoenix|x-ray v|tome|x S 240-180 CT scanner. Informations about voltage and current are not available for these scans. Avizo 6.1.1 (Visualization Sciences Group) and Mimics® Innovation Suite v.16 and v.17 (Materialise) were used for segmentation and 3D object rendering. Polyworks 10.0.5 (InnovMetric Inc.) was used for measurements.

10. **MHNC 8360 (*isolated petrosal bone*):** *Fig. 50*
    The scan was made with an isotropic voxel size of 0.00893 mm for a final stack of 1012 slices.

11. **MHNC 8419 (*isolated petrosal bone*):**
    The scan was made with an isotropic voxel size of 0.01047 mm for a final stack of 798 slices.