X-ray microtomography as a tool to present and discuss new taxa: the example of *Risananeiza* sp. from the late Chattian of Porto Badisco.

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In many earth science studies, especially in paleontology, examination and/or measurement of internal features of samples are requested. X-ray computed tomography (CT) is for such tasks very well suited. The best-known advantage of X-ray CT is its ability to reconstruct quickly and non-destructively the interior of opaque solid objects in three dimensions when the density contrast is high enough to let the X-ray differentiate the internal features. The computed tomography is thus a powerful tool for biometric study as the obtained scans are scaled according to the reported voxel size and therefore suited for linear and volumetric measurements (Speijer et al., 2008; Briguglio et al., 2011; Görög et al., 2012; Hohenegger & Briguglio, 2012). For many fossils, X-ray CT may be the only practical means of gaining information on internal materials and geometries or other features hidden from external view (e.g., Speijer et al. 2008). Description of fossil forms and the quantification of some morphologic relevant parameter are the keys to investigate fossils for taxonomic purposes, and consequently for palaeoenvironmental analyses and for biostratigraphic purposes. Measuring morphologic parameters of shells, bones or tests requires often the destruction of part of the body or oriented cuts trough the test. In this study, we used high resolution x-ray tomography (SkyScan 1173, see Fig 1) to run some measurements on well preserved fossil tests of rotaliids, foraminifera. With dedicated 3D graphic working station at the Department of Palaeontology in the University of Vienna, all chambers of the foraminiferan have been segmented, rendered and on the extracted three dimensional objects, the reported parameters have been measured.

A new species has been detected and studied by means of x-ray tomography. The specimens have been collected from the type locality of the Porto Badisco Calcareous, which is the Porto Badisco cave, 8 km south of Otranto, in the Salento Peninsula (Fig. 2). The new species has been at present named *Risananeiza* sp. as it possesses all morphological features of the relative forms of the genus *Risananeiza* (Figs. 3 & 4): a system of intraseptal canals evolving in marginal sutureal canal, a test plate at the base of each chamber, vertical tunnels in both ventral and dorsal sides, and pustules covering the whole test.

Detailed biometry on the type material is under review by the Bollettino della Società Paleontologica Italiana. Since the dataset obtained by x-ray scanning is digital, it can be upload and shared with the scientific community so that the 3D model of the holotype can be seen and studied by everyone (Fig. 5-6). Complete stacks of the holotype (Fig. 7) sliced every 6 microns on the equatorial (Fig. 8) and on the axial planes (Fig. 9). Most important for taxonomic purposes, are here reported.

**Fig. 7** Dataset of the holotype.

**Fig. 8** Axially oriented slices of the holotype (6×6 microns).

**Fig. 9** Equatorial oriented slices of the holotype (2×2 microns).

**Fig. 10** – 3D model of the holotype.

**Fig. 11** – 3D model of the holotype.

Referring publications:


