# A new specimen of Petalodus from the Brigantian (Viséan, Mississippian) of Co. Kerry, Ireland

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## 1. Introduction

Petalodontiforms are a clade of chondrichthyans, cartilaginous fish including sharks and rays, which had flattened bodies with petal-like teeth. They are known mostly from isolated teeth, which has led to major problems when trying to understand the taxonomy and physiology of these fish. Here, a rare collection of petalodontiform teeth are described.

## 2. Locality

A petalodontiform specimen (TCD. 31087) was collected from a calcareous laminated mud horizon in the Corgrig Lodge Formation (Fig. 1)



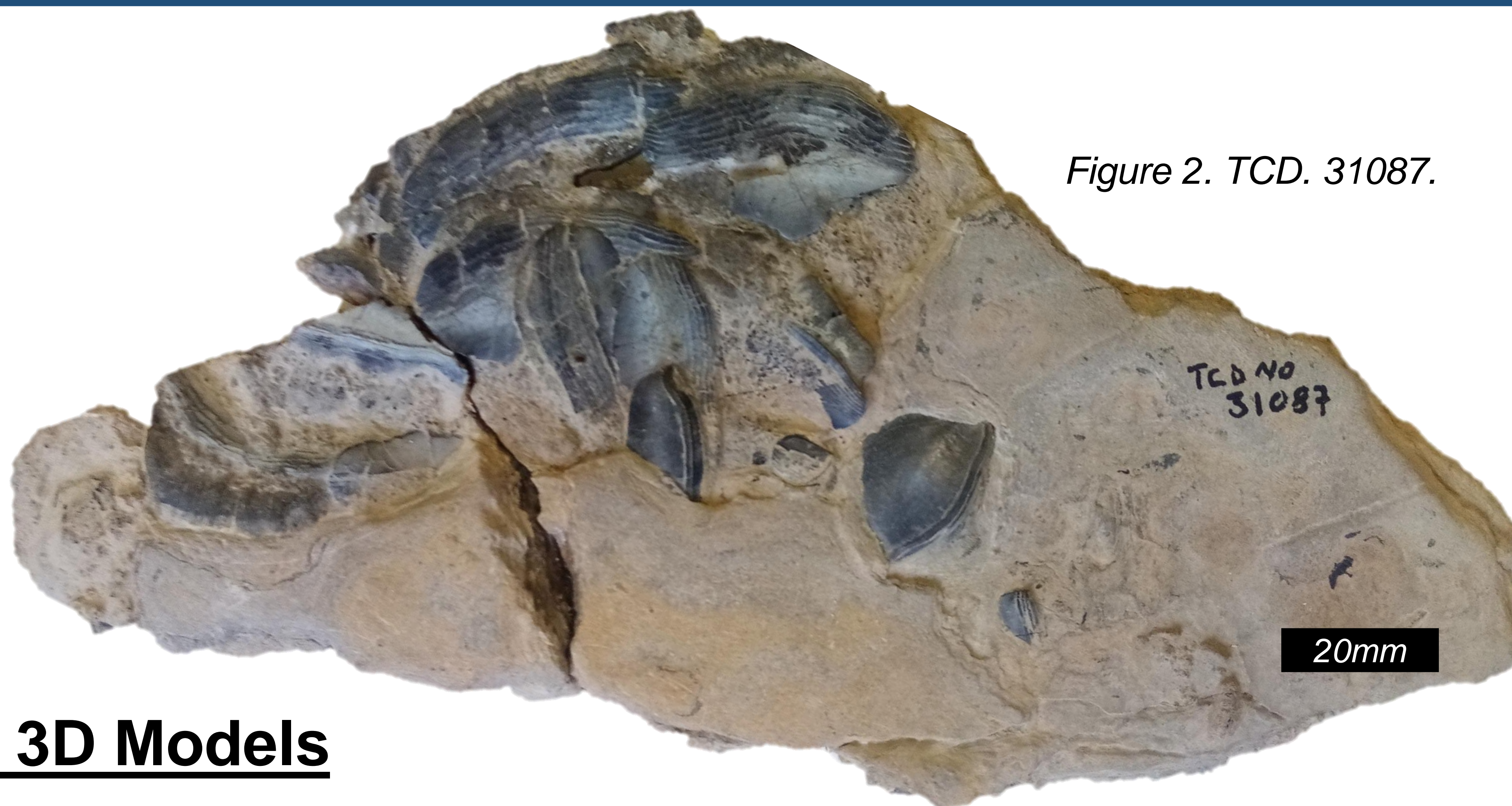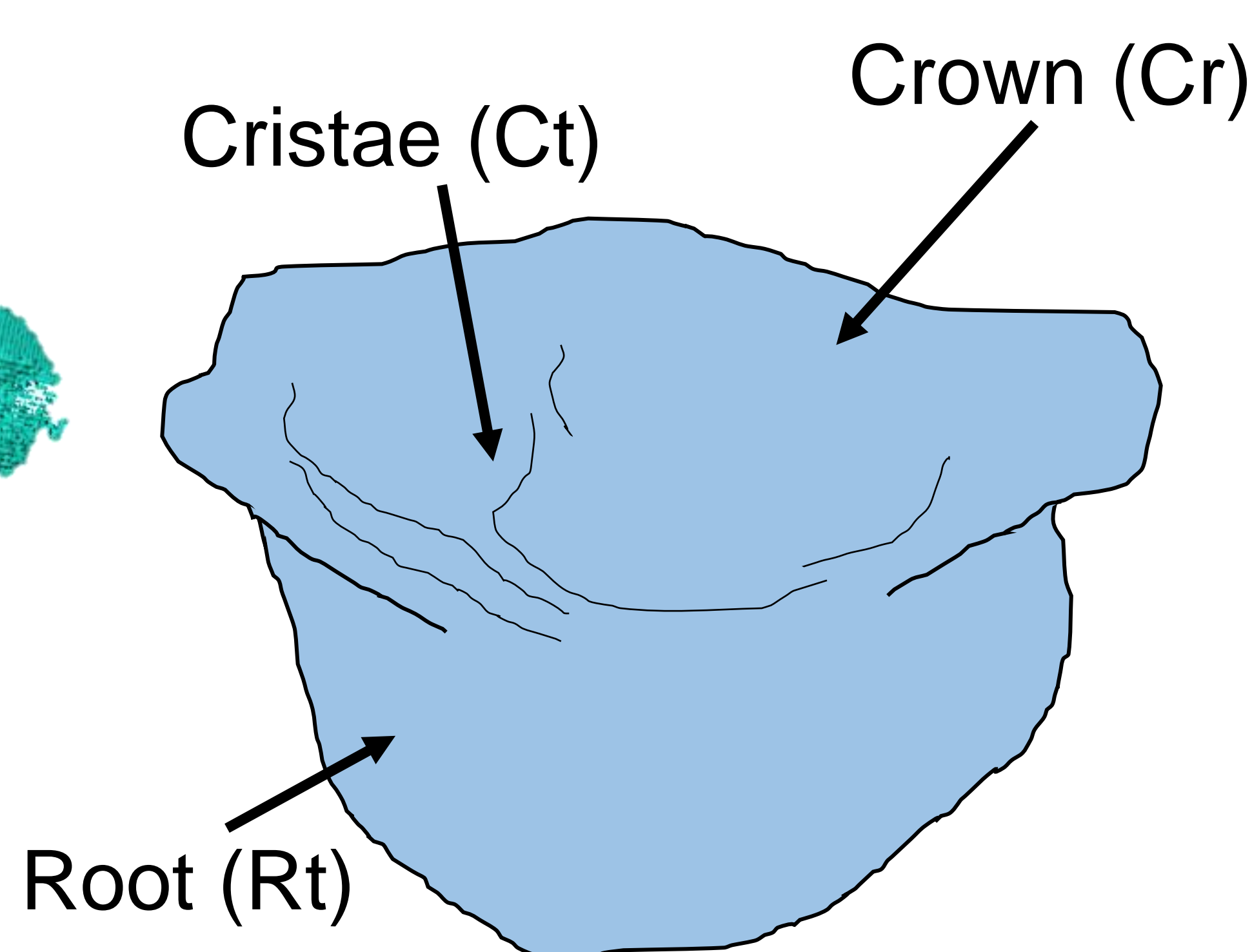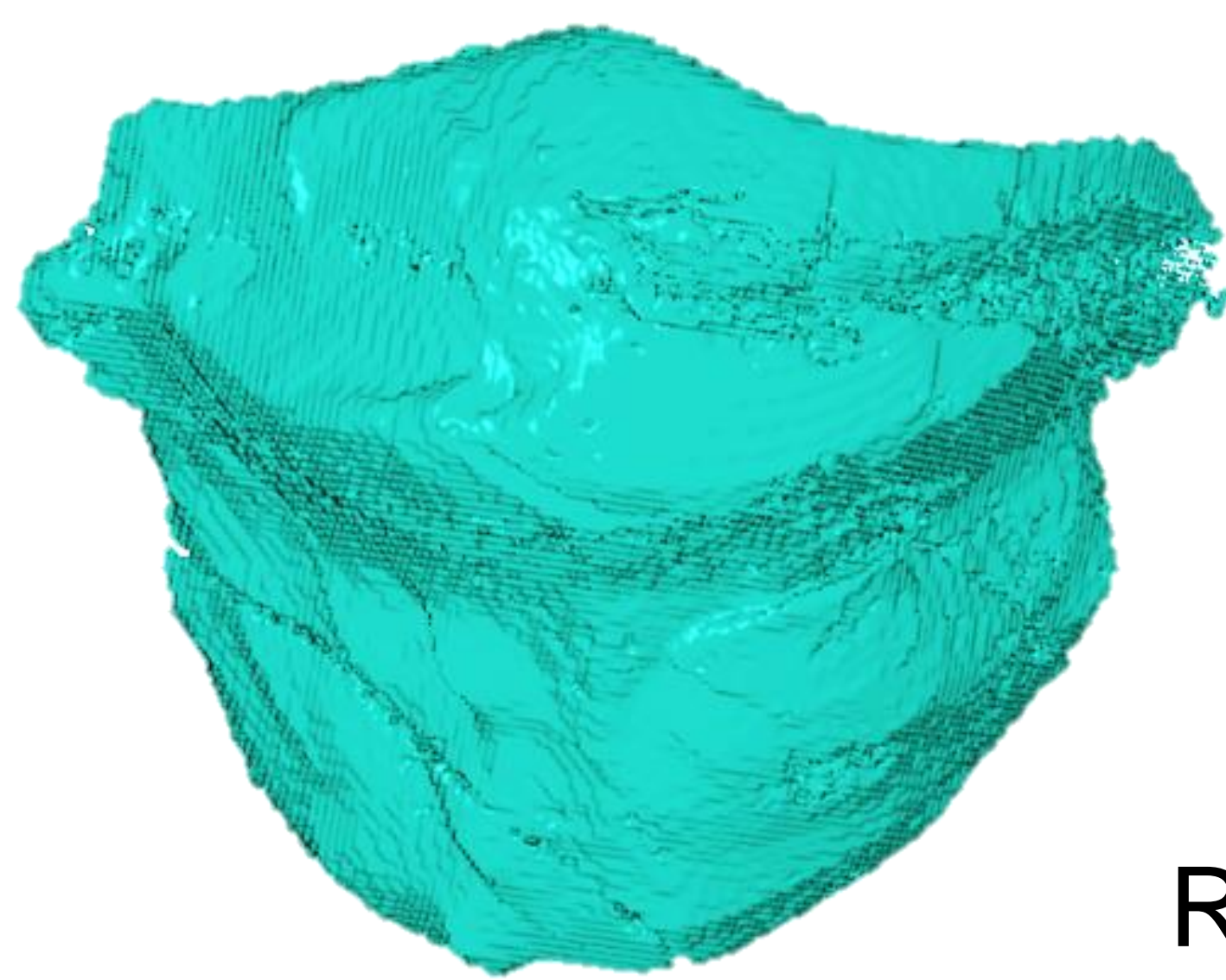*Figure 1. Map showing the quarry where TCD. 31087 was collected*
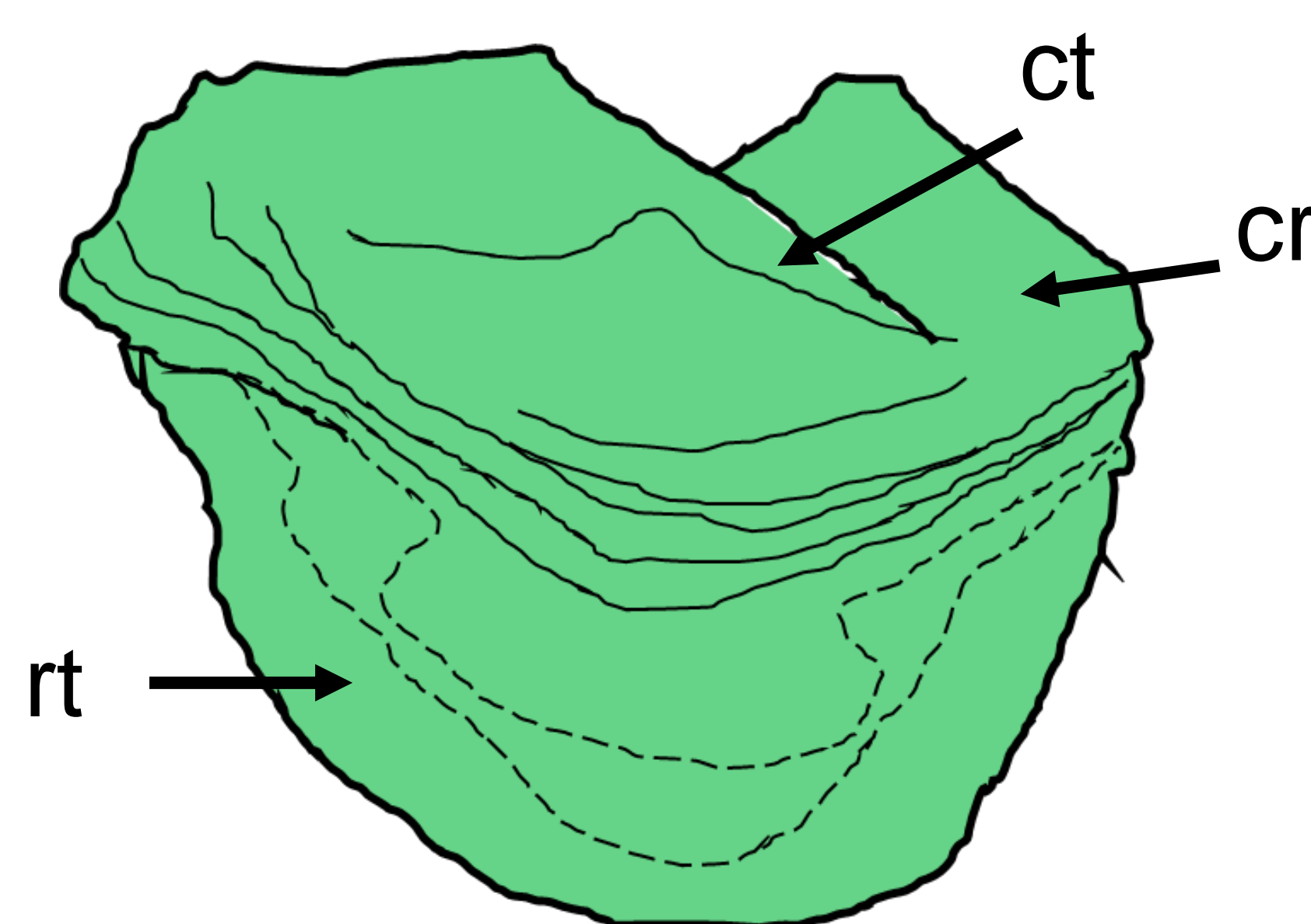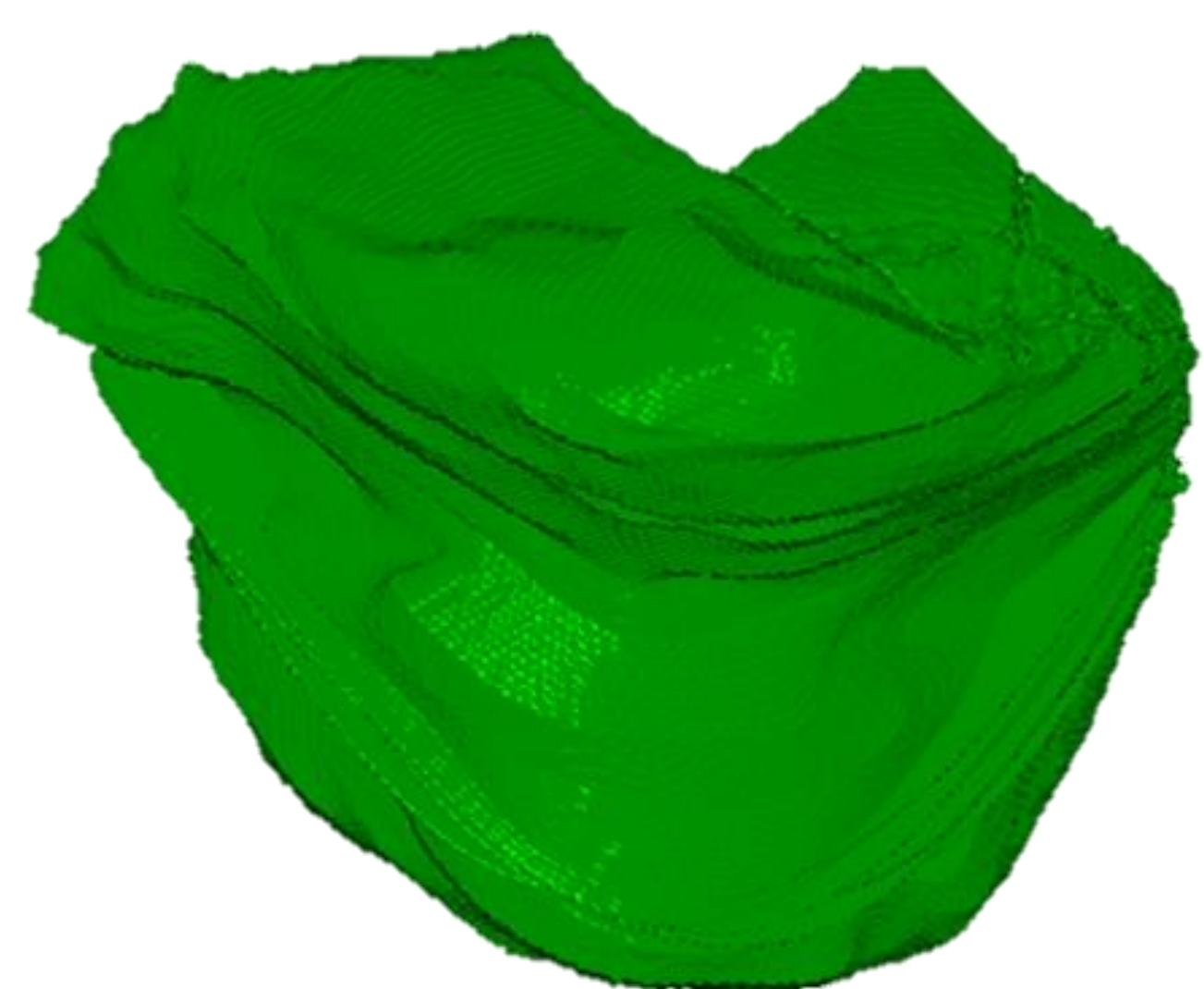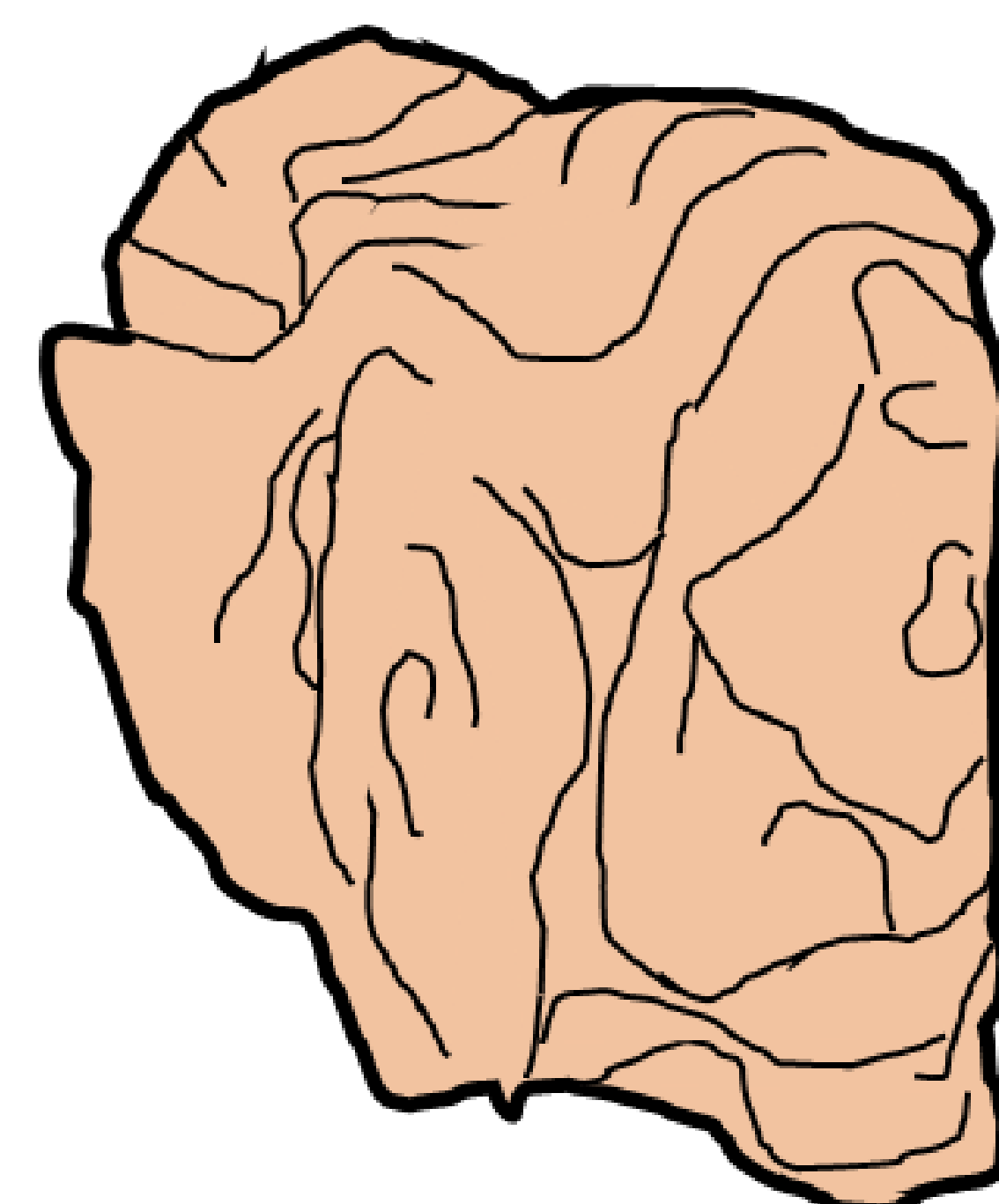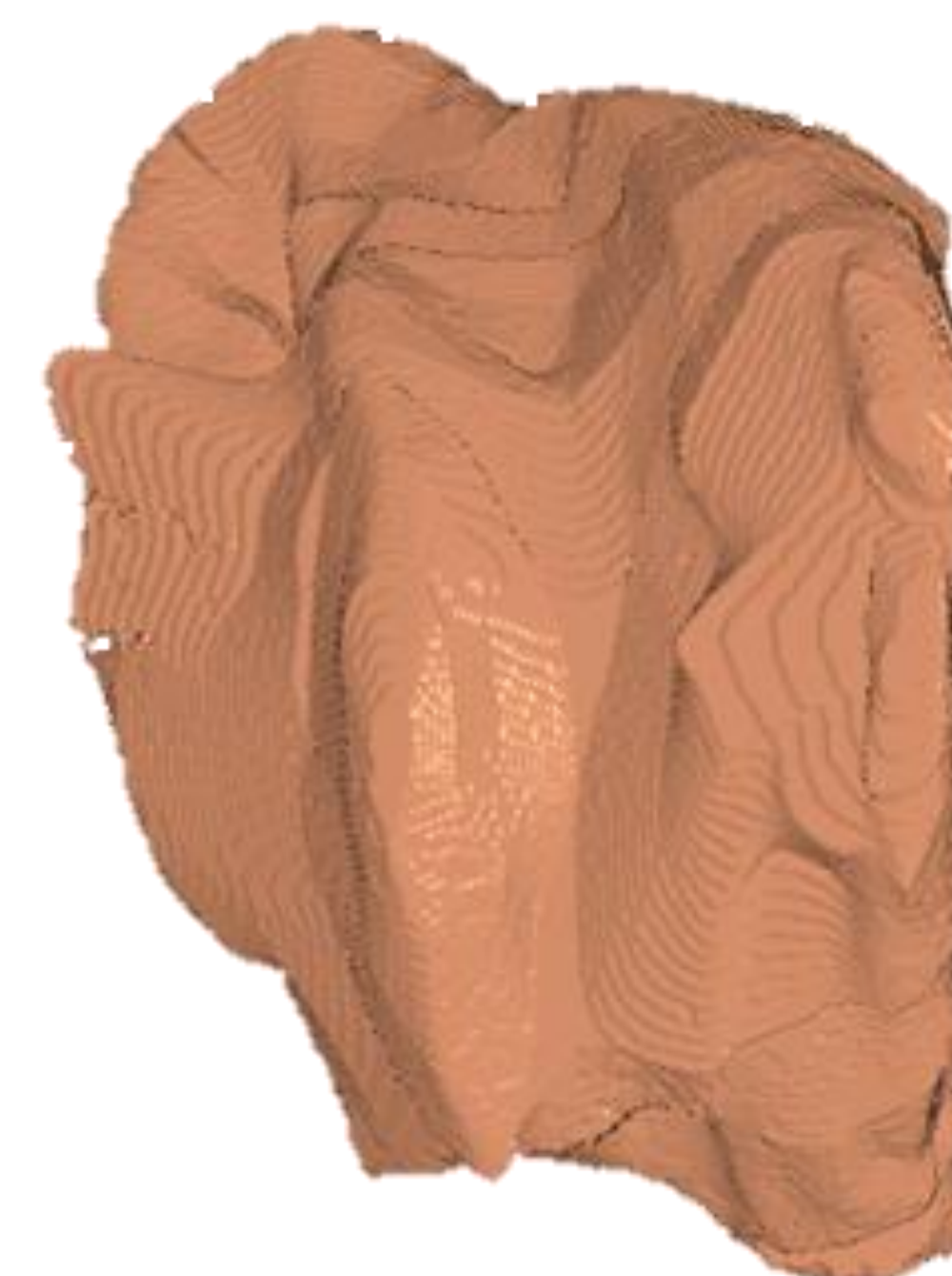
## 3. Materials and Methods

TCD. 31087 (Fig. 2), which preserves a series of petalodontiform teeth, was scanned using micro-computed tomography and resultant TIFFs were imported into SPIERS in order to render 3D models.



*Figure 2. TCD. 31087.*
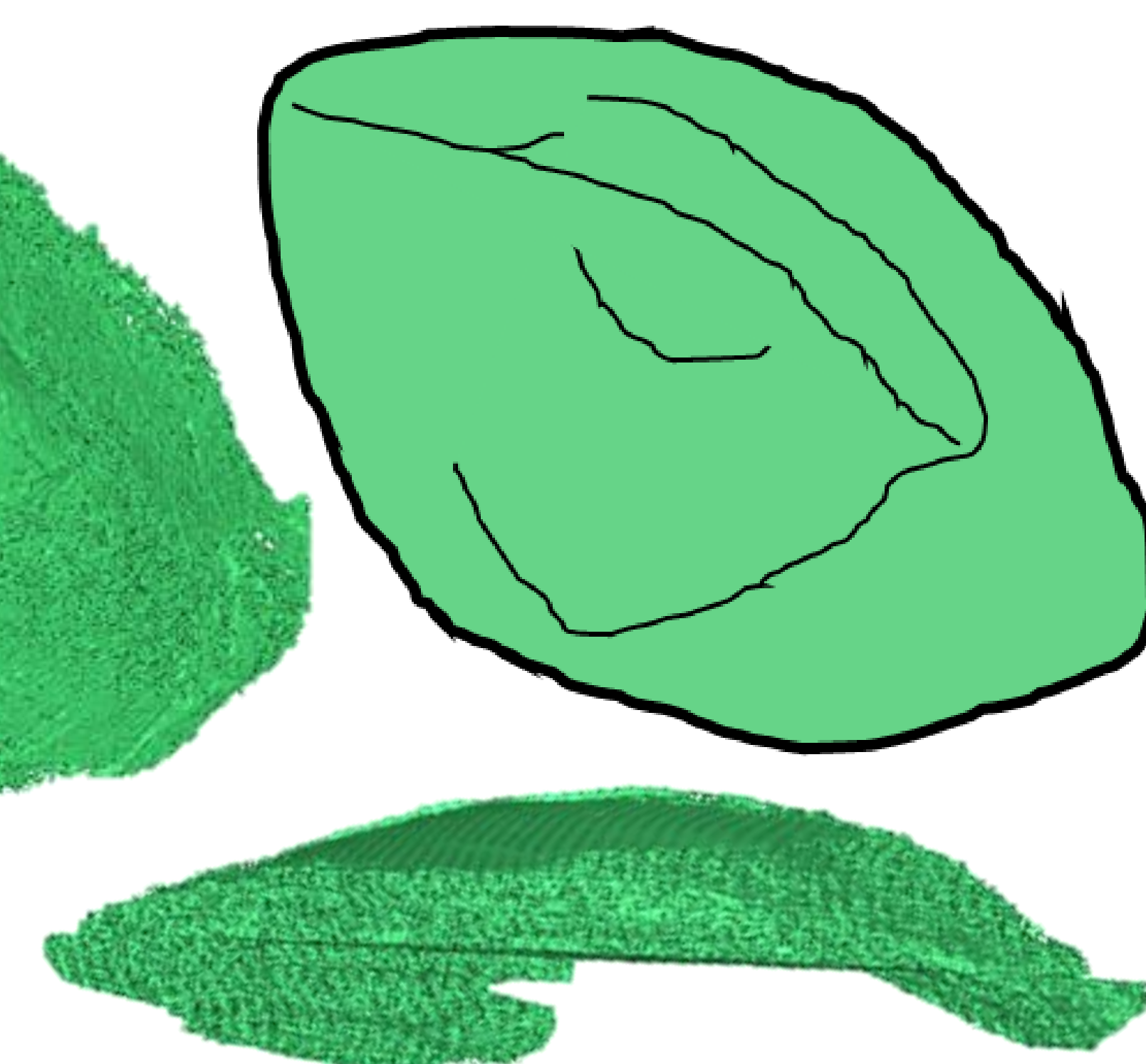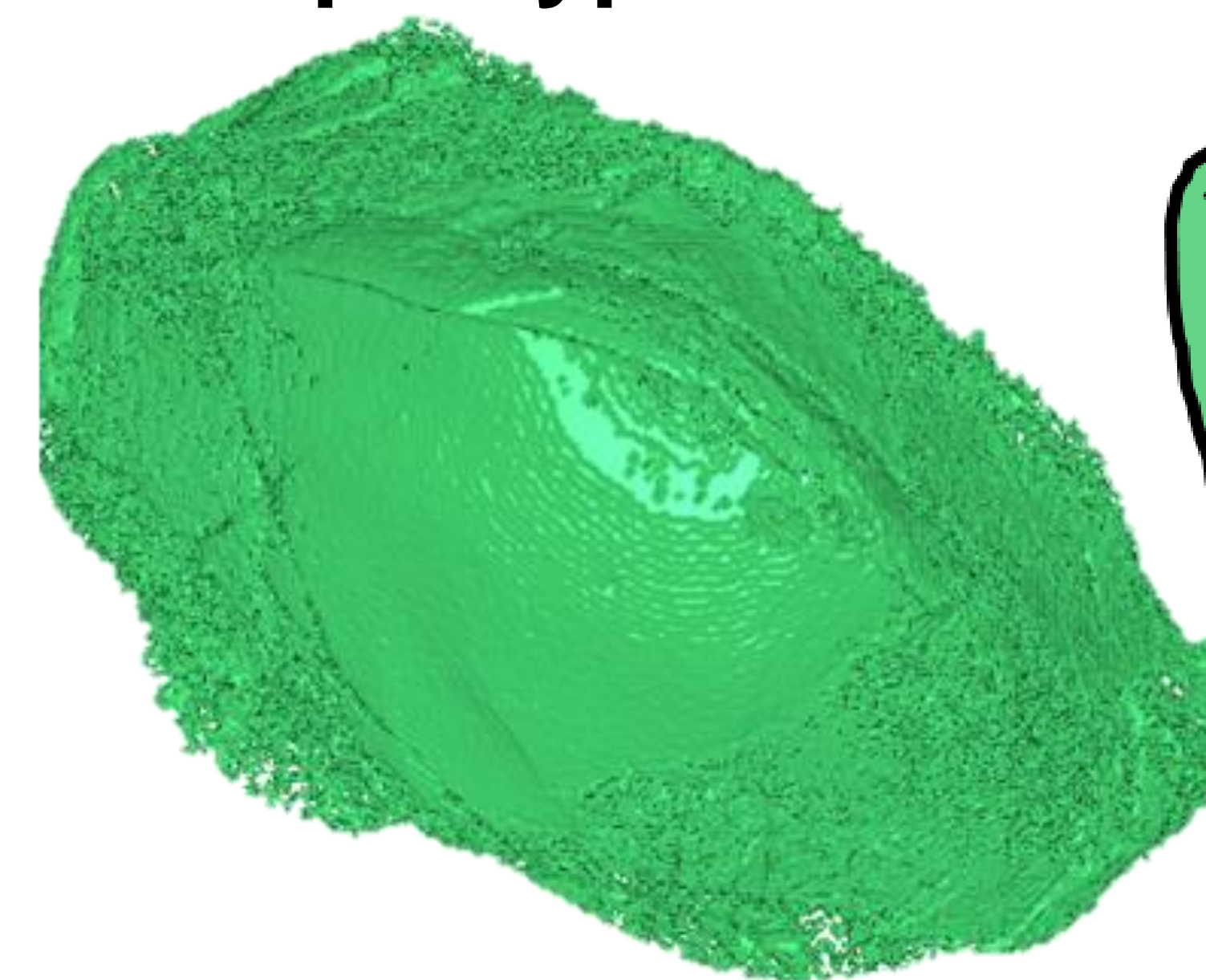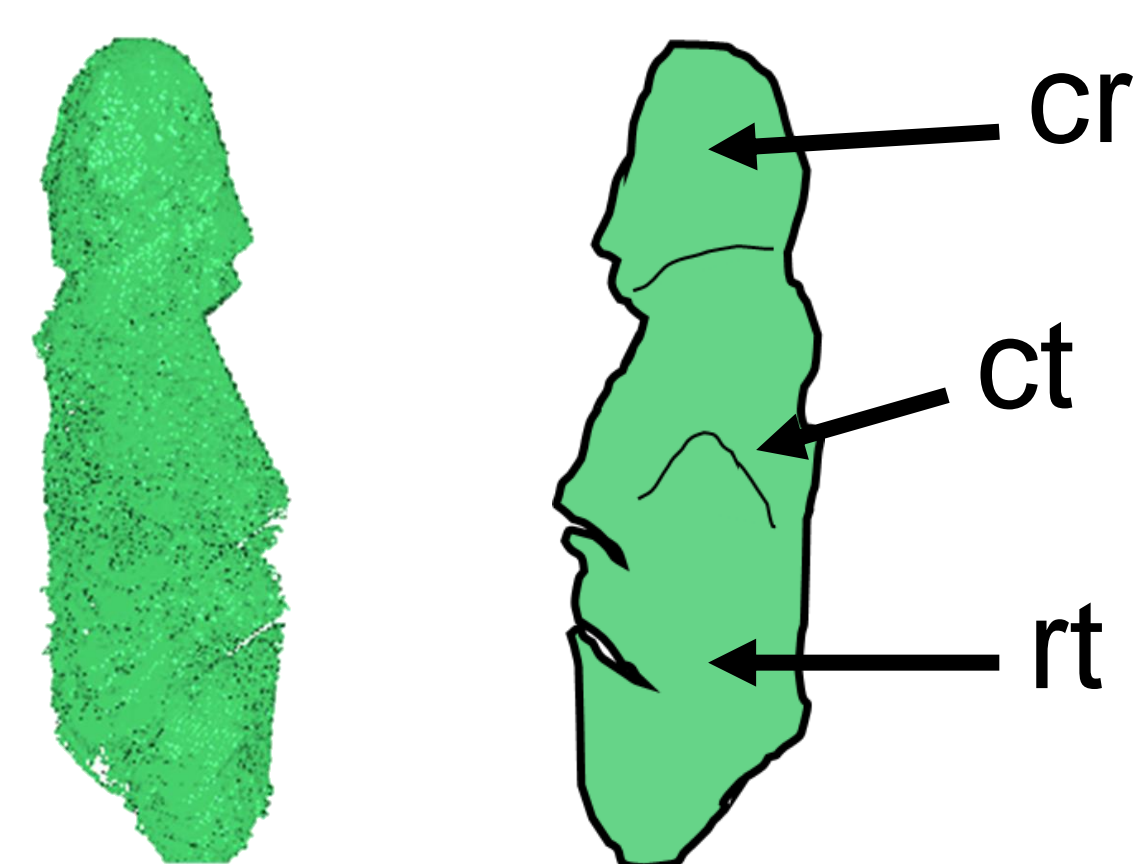
## 4. 3D Models

**Tooth Morphotype 1**



Cristae (Ct)
Crown (Cr)
Root (Rt)

**Tooth Morphotype 2**



ct
cr
rt

**Tooth Morphotype 3**



**Tooth Morphotype 4**



cr
ct
rt

*Figure 3. 3d models and sketches of the four different tooth morphotypes found in TCD. 31087. Abbreviations are: cr, crown, ct, cristae and rt, root.*

## 5. Classification

The teeth of TCD. 31087 have undenticulated triangular crowns (Fig. 3) characteristic of *Petalodus* and are most similar to those seen in *P. ohioensis*. However the teeth of TCD. 31087 three cristae, while those of *P. ohioensis* have between 6-8. Therefore it is identified as **Petalodus cf. ohioensis.**

## 6. Tooth Whorl vs Biting Adaption

The curvature in the teeth of *Petalodus* is thought to either accommodate tooth stacking in a whorl (Carpenter & Ottinger, 2018) or to allow for the opposing teeth in the opposite jaw to slide past one another during biting (Lund *et al.* 2014). TCD. 31087 has three teeth of Morphotype 1 stacked together in the same orientation and would limit the accommodation space from opposing teeth, supporting the idea that teeth were part of a whorl.