

[Supplementary material]

Sherds as archaeobotanical assemblages: Gua Sireh reconsidered

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Radiocarbon dating calibrations

Table S1. Calibrations for radiocarbon dates discussed in paper. Calibrations undertaken using CALIB rev. 7.1.0 (Stuiver & Reimer 1993) and IntCal13 calibration dataset (Reimer *et al.* 2013). Dates for Gua Sireh from Bellwood *et al.* 1992 and date for Andarayan from Snow *et al.* 1986. Note: calibrated radiocarbon dates are rounded to nearest five years in text.

Site name	Laboratory code	Radiocarbon age (BP)	Sample type	Radiocarbon date (cal BP)	% (2 sigma)
Gua Sireh	CAMS-725	3850±260	Adhered rice	4959–4928	0.5
			(<i>Oryza</i> sp.)	4908–4902	0.1
			grain	4891–3565	99.4
Gua Sireh	CAMS-721	1480±260	Organic	1987–1957	0.6
			inclusions	1953–906	99.0
				850–831	0.4
Andarayan	Not provided	2380±110	Organic inclusions	3972–3379	100.0

Rice spikelet base reference images

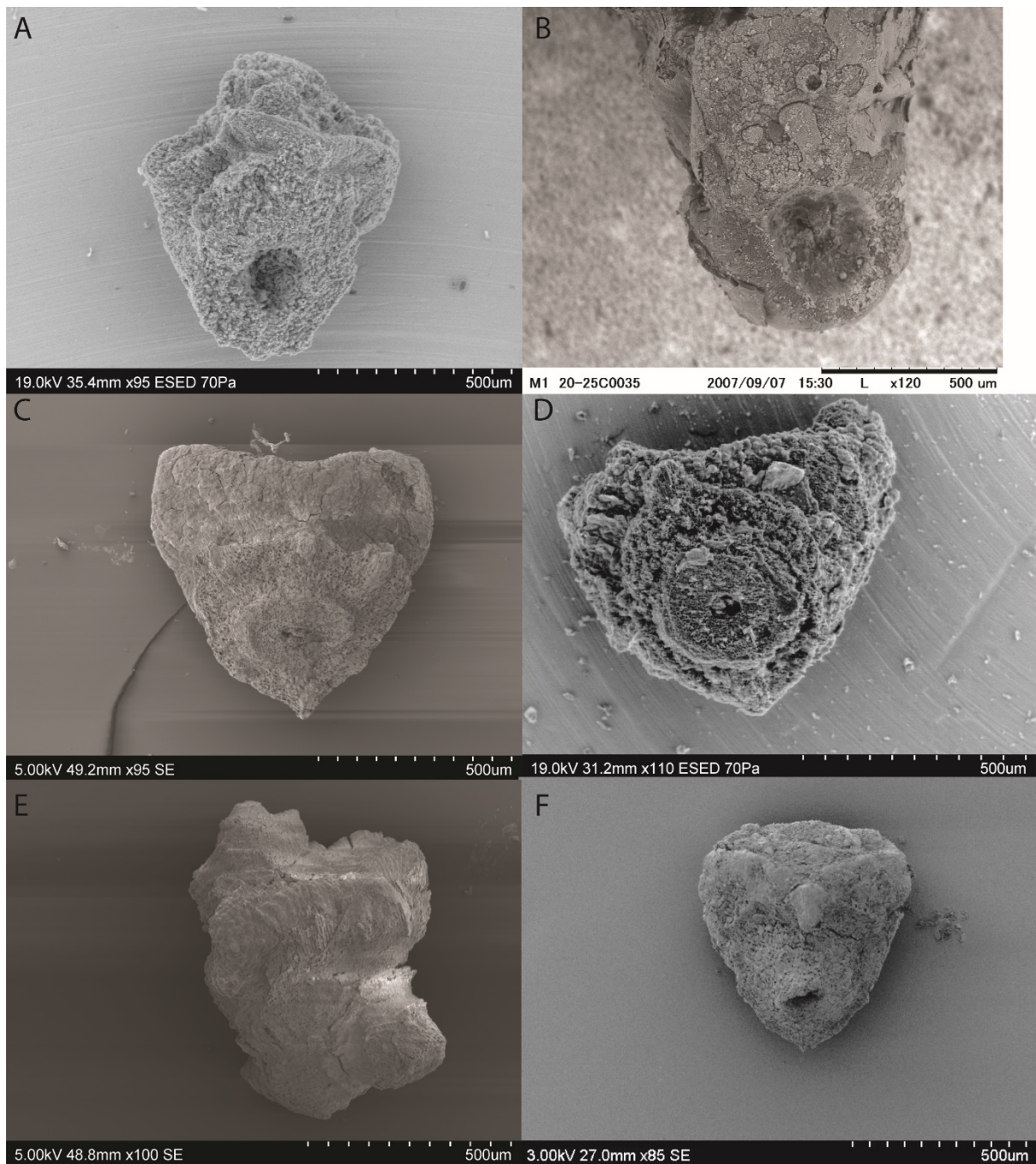


Figure S1. Examples of rice spikelet base categories from charred archaeological macro-remains, including (A–B) domesticated (ripped), (C–D) wild (smooth) and (E–F) immature (torn rachilla): A) Longshan period Chengyao (Henan, China); B) Early Historic Ter (Maharashtra, India); C) Neolithic Tianluoshan (Zhejiang, China); D) Longshan period Chengyao (Henan, China); E) lateral view, Neolithic Tianluoshan (Zhejiang, China); F) adaxial view, Neolithic Tianluoshan (Zhejiang, China) (SEM images provided by Dorian Fuller).

Attempted AMS dating of organic inclusions

A portion of the younger sherd (originally dated by CAMS-721) containing rice spikelet bases was lightly crushed using a mortar and pestle to extract rice spikelet bases and other organic materials for AMS dating. Initially, individual husk and spikelet inclusions were examined under dissecting microscope and extracted using brushes. Neither floating the debris in water or LST heavy liquid (lithium heteropolytungstate, specific gravity 2.75gcm^{-3}) helped to concentrate sufficient charred rice remains for AMS dating. Ideally, an individual organic inclusion, such as a rice grain or spikelet base, would be selected from a sherd for AMS dating. However, individual elements contained insufficient carbon for a robust AMS date, so a bulked sample of elements derived from rice was used. Unfortunately, the organic elements were extremely fragile and only 0.25mg could be collected. Of this only 28% survived an acid-base-acid pretreatment resulting in a tiny sample for radiocarbon (0.3–1mg carbon is routinely dated at the ANU radiocarbon facility). During combustion in the presence of CuO wire to provide oxygen and Ag foil to remove chloride and sulphur contaminants, the gas etched through the sealed quartz tube and no CO₂ sample could be recovered. This suggests that the sample was extremely contaminated with a non-organic compound, and the charred organic material may have been partially replaced by a mineral phase.

Rice spikelet base visualisations

Visualisations of 50 rice spikelet base inclusions within sherd CAMS-721 from Gua Sireh on Borneo. MicroCT scanning data rendered using Drishti Paint v.2.6.4 and Drishti Renderer v.2.6.4 and provided by Aleese Barron.

Table S2. Summary of species and domestication status of 50 rice (*Oryza* spp.) spikelet bases within sherd CAMS-721.

Type	Inclusion number	Count	%
Domesticated-type (<i>O. sativa</i>)	1, 3, 5, 10, 11, 12, 13, 14, 16, 18, 19, 20, 21, 22, 23, 24, 26, 28, 30, 31, 32, 34, 36, 38, 39, 40a, 40b, 42, 45, 46, 48, 50, 51, 54, 56	35	70
Indeterminate (<i>O. sativa/rufipogon</i>)	8, 25	2	4
Wild-type	4, 6, 27, 35, 37, 44, 47, 49, 52, 53, 55	11	22

(O. rufipogon)

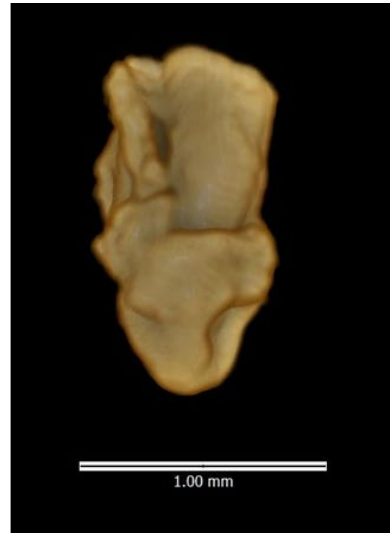
Another wild rice species

17, 29

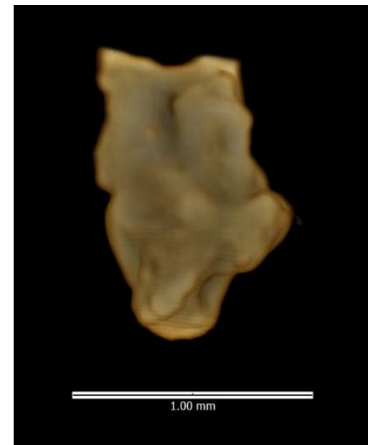
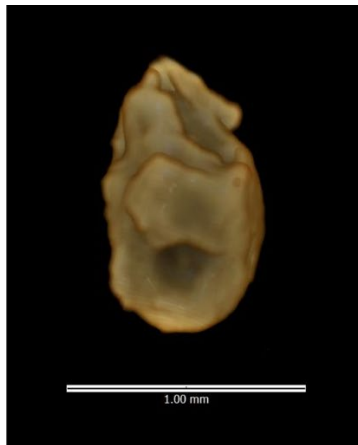
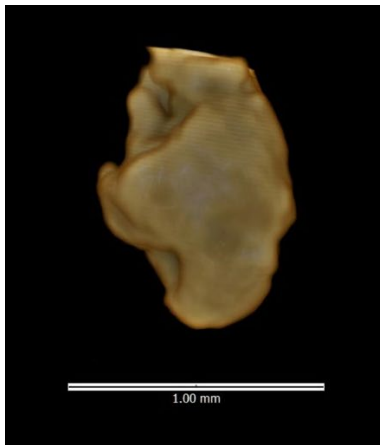
2 4

(Oryza sp.):

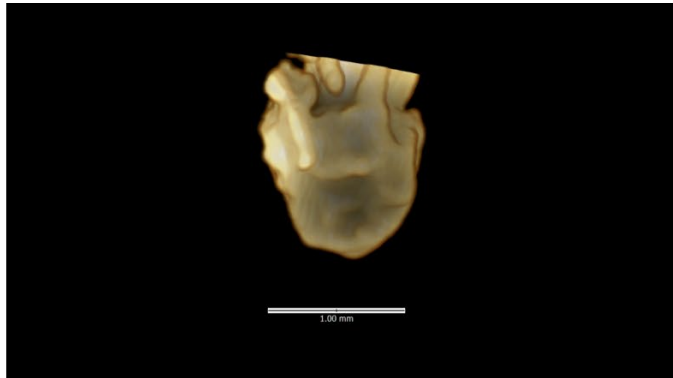
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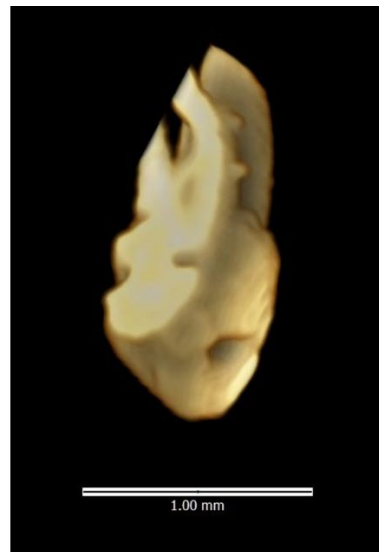
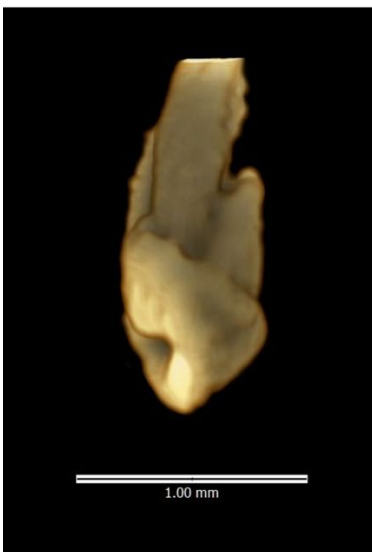
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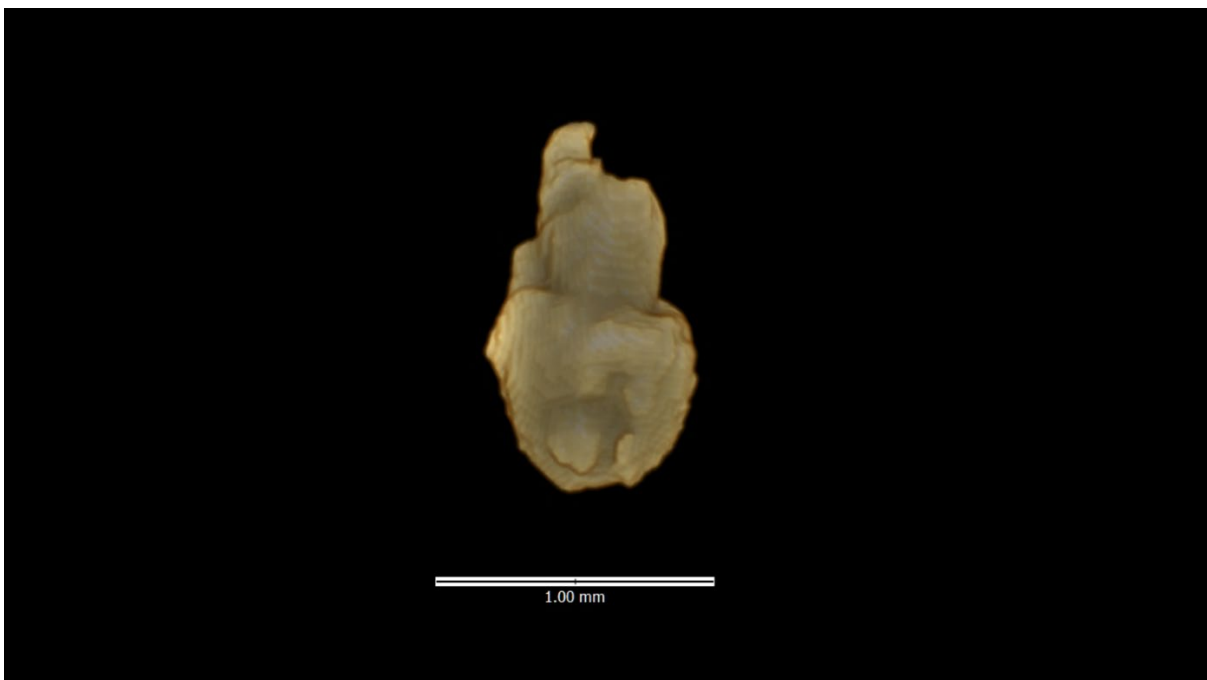
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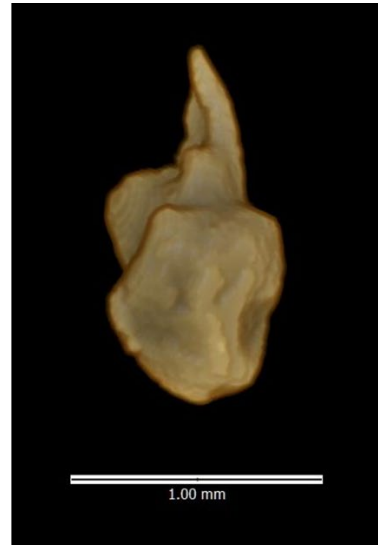
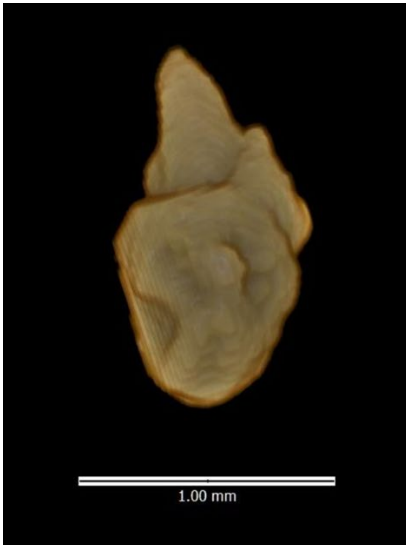
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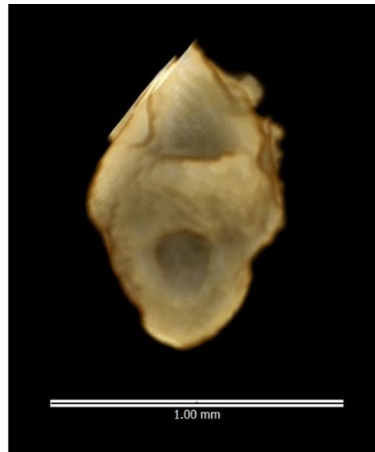
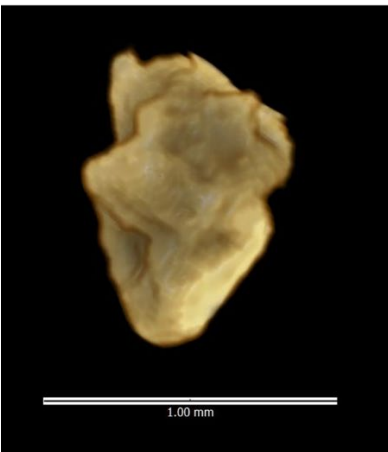
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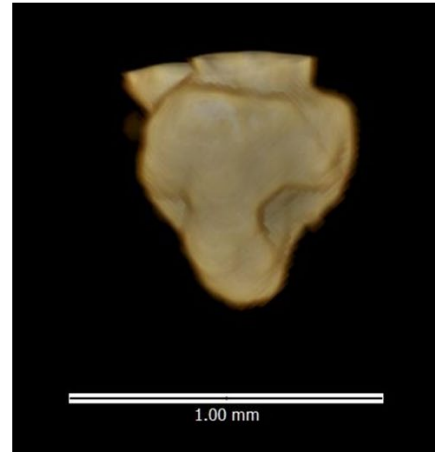
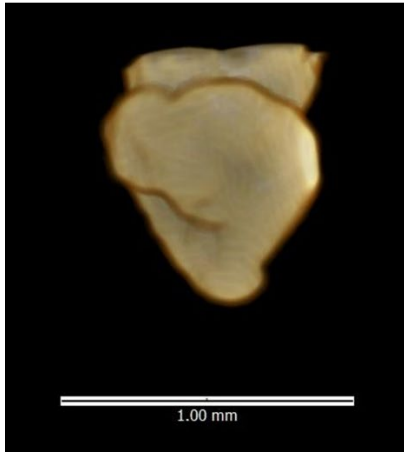
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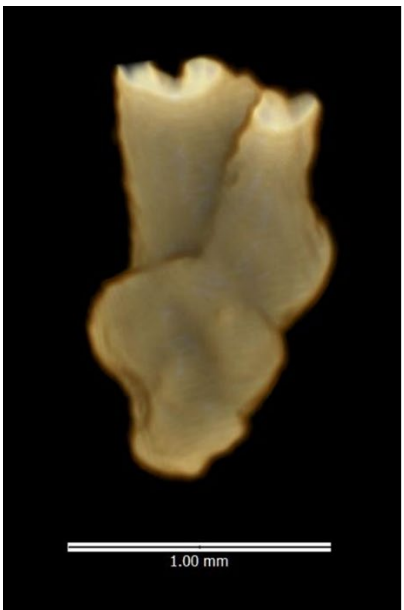
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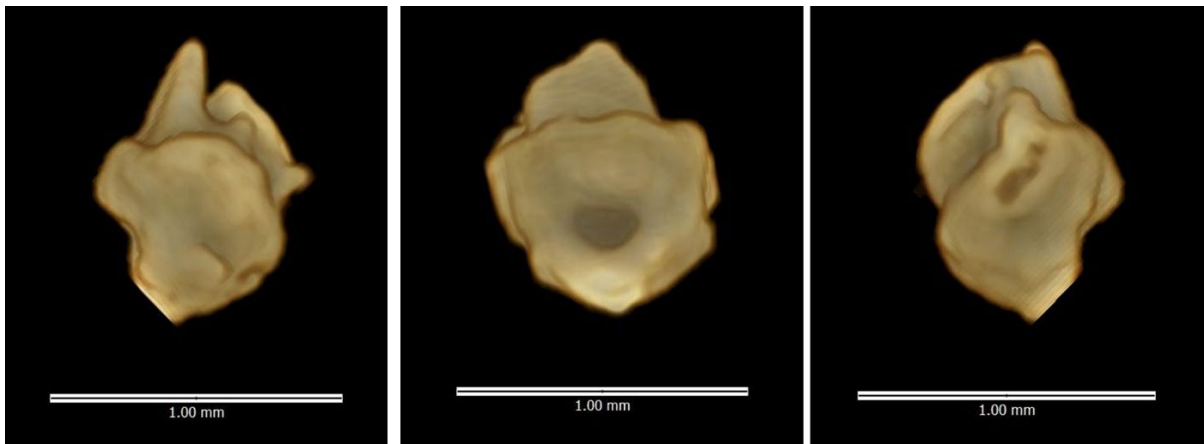
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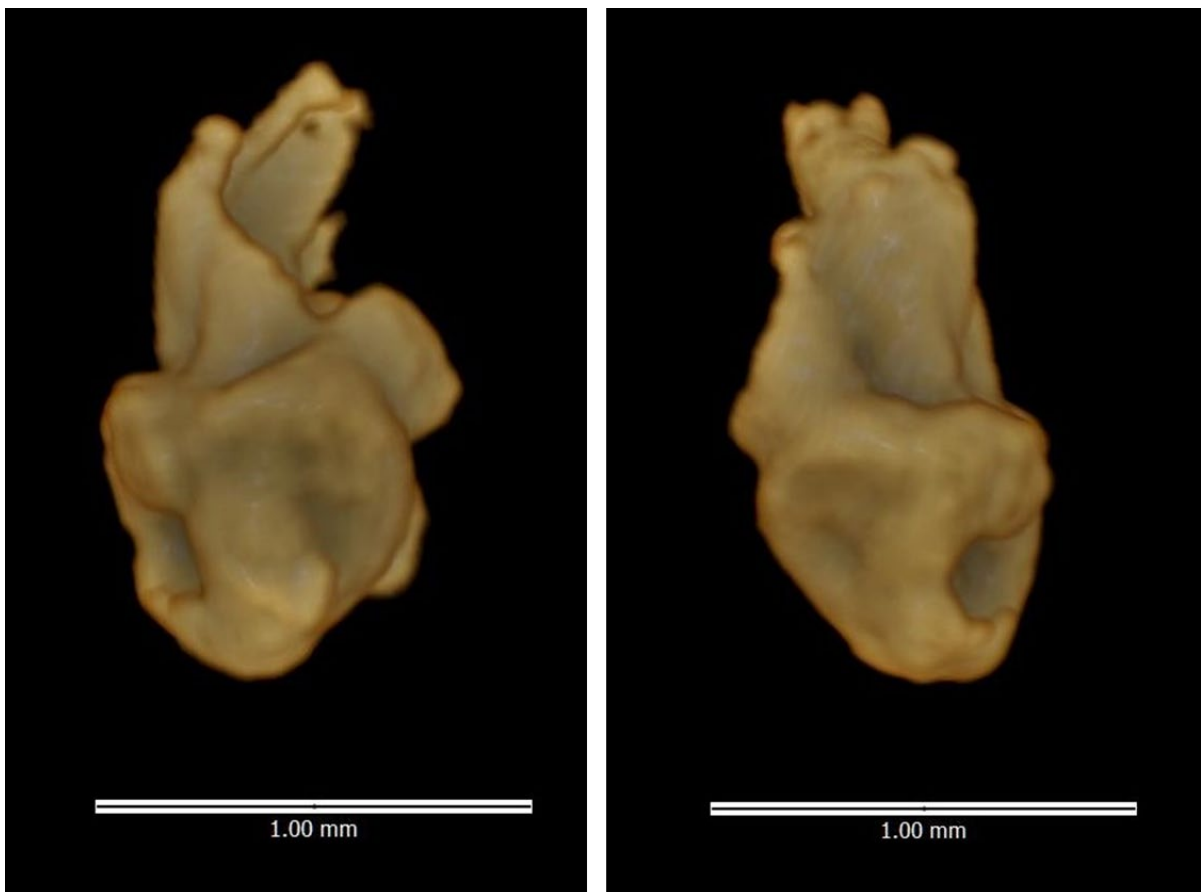
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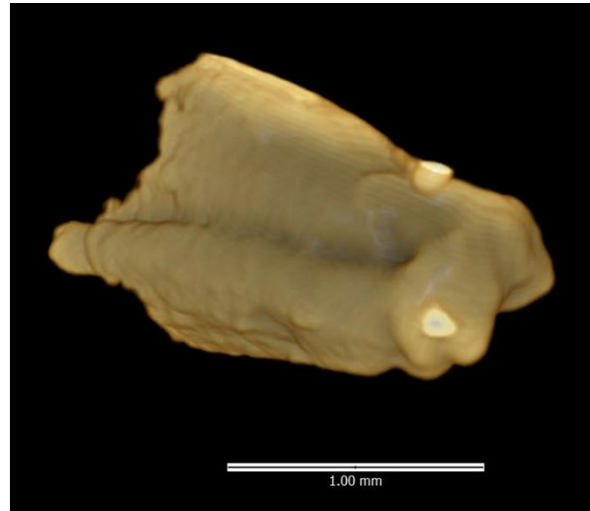
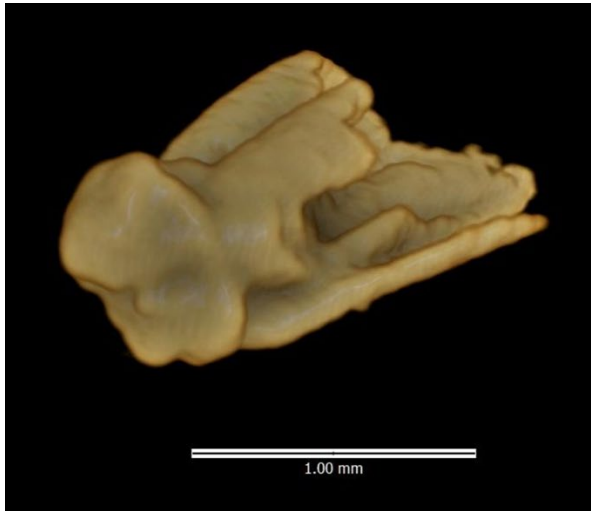
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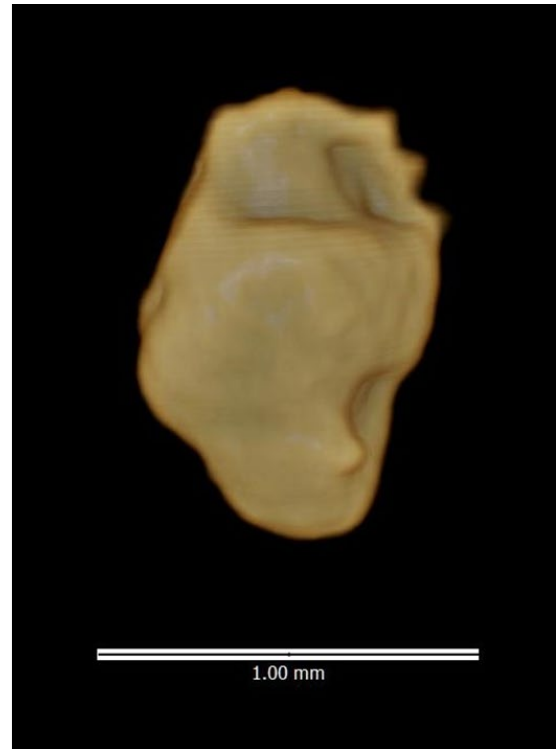
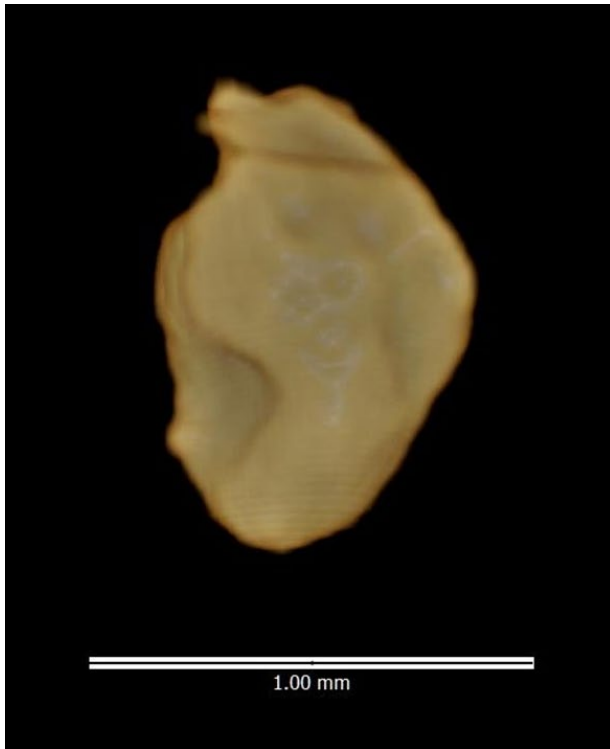
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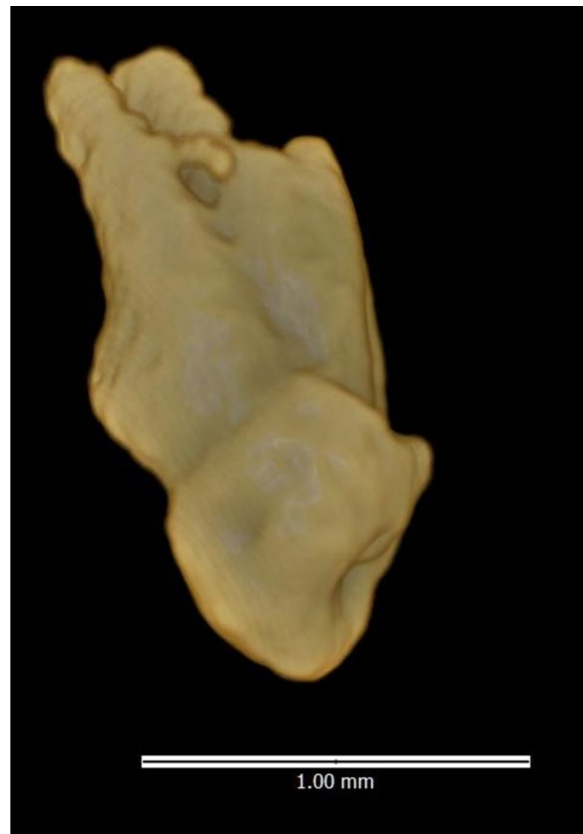
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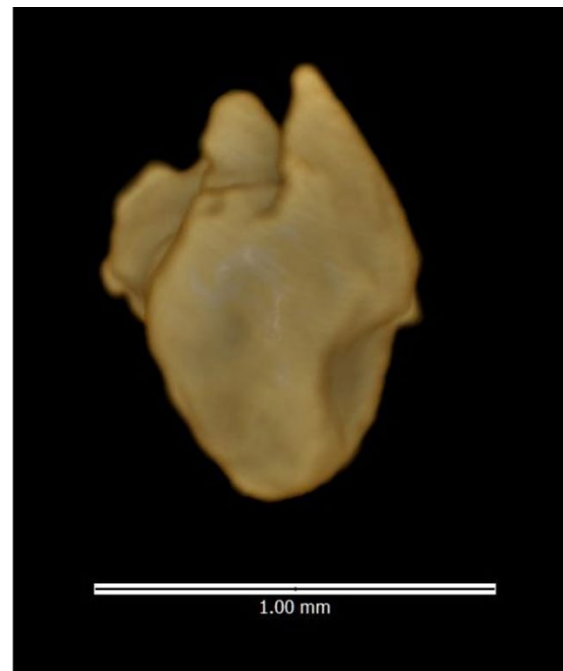
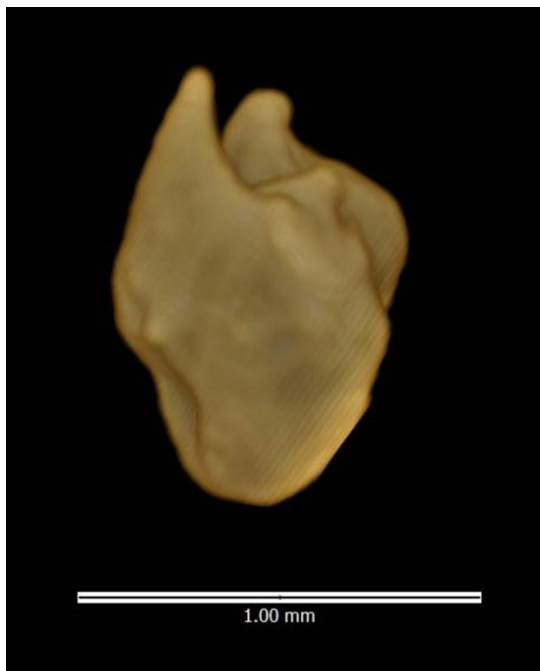
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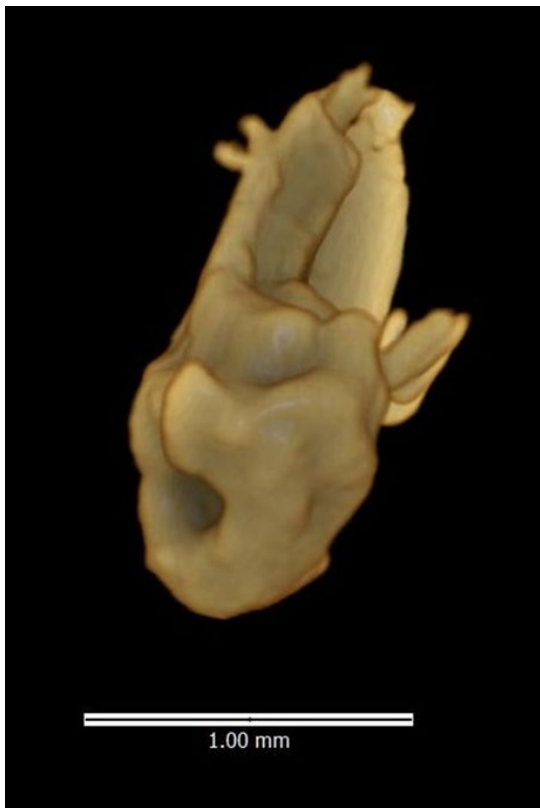
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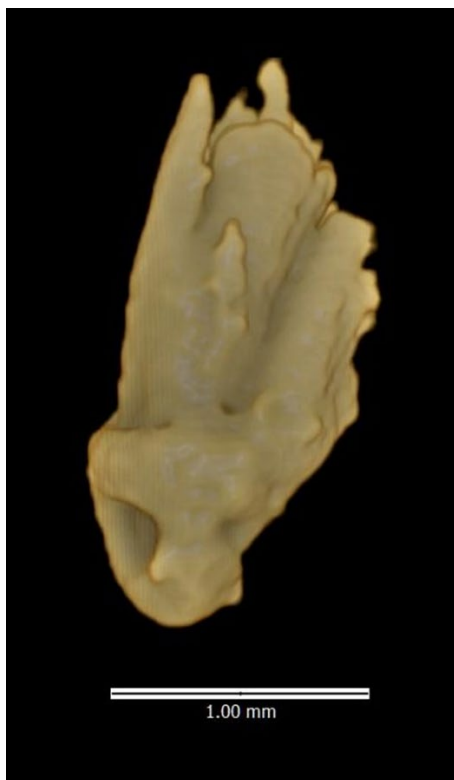
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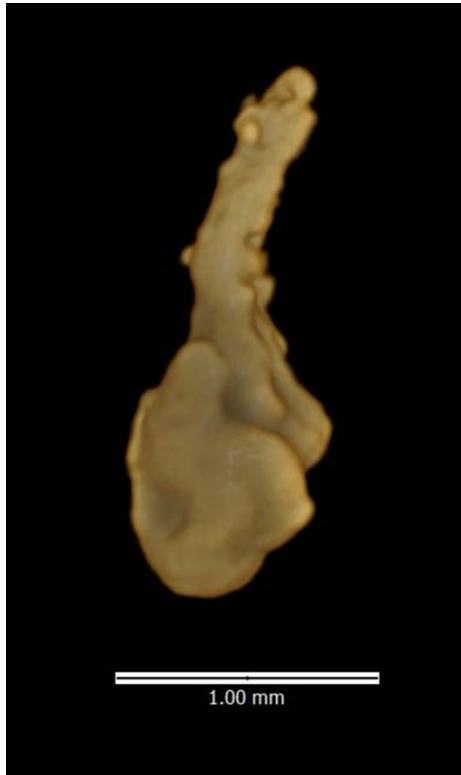
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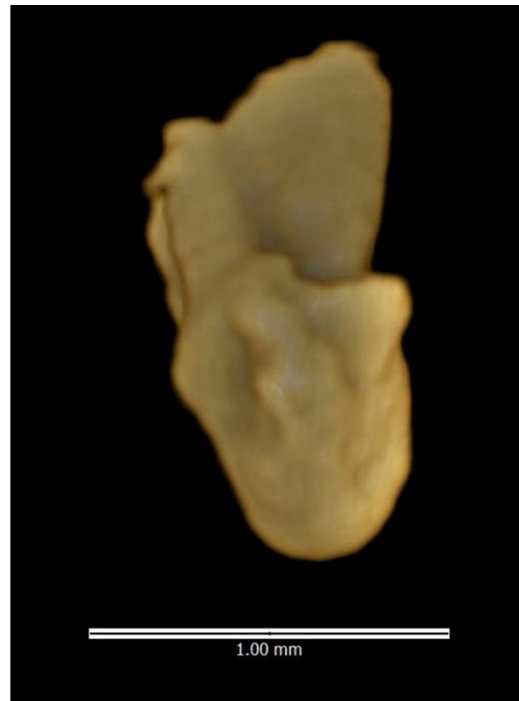
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Inclusion 24



Inclusion 25



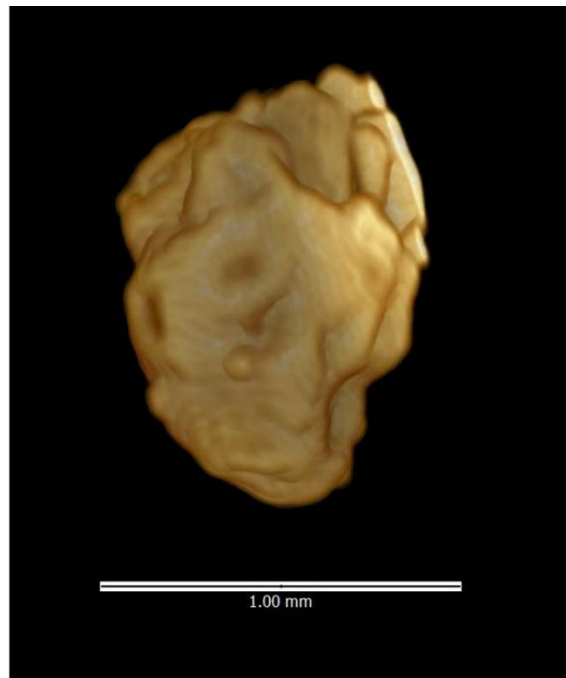
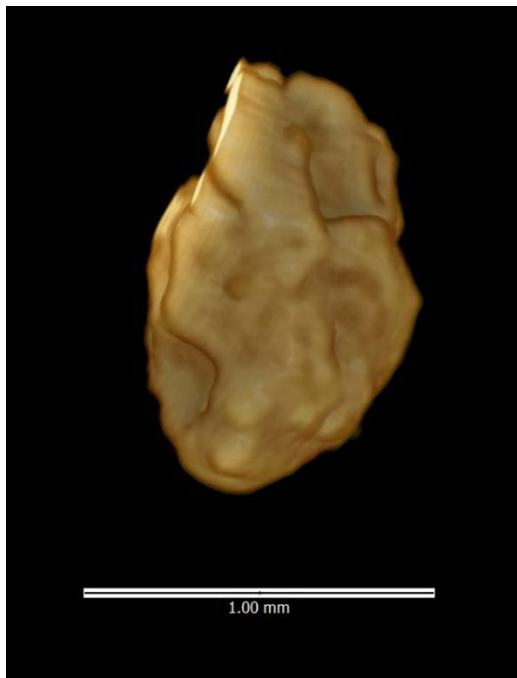
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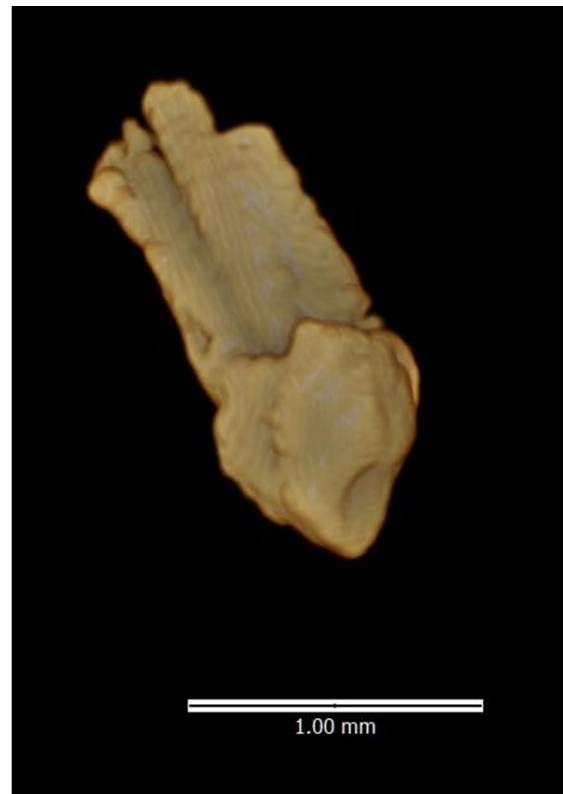
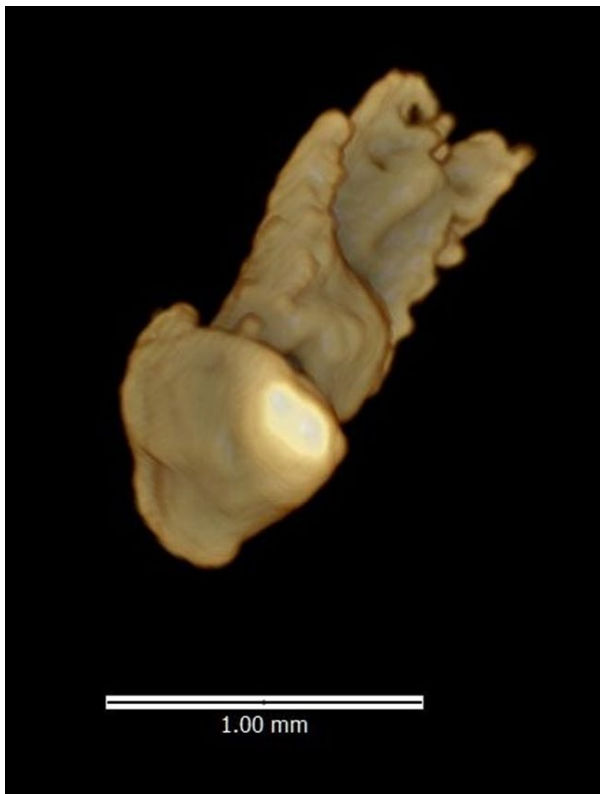
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Inclusion 30



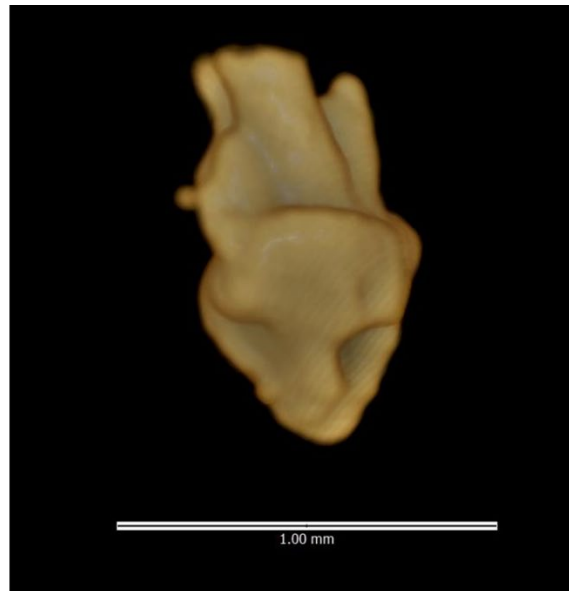
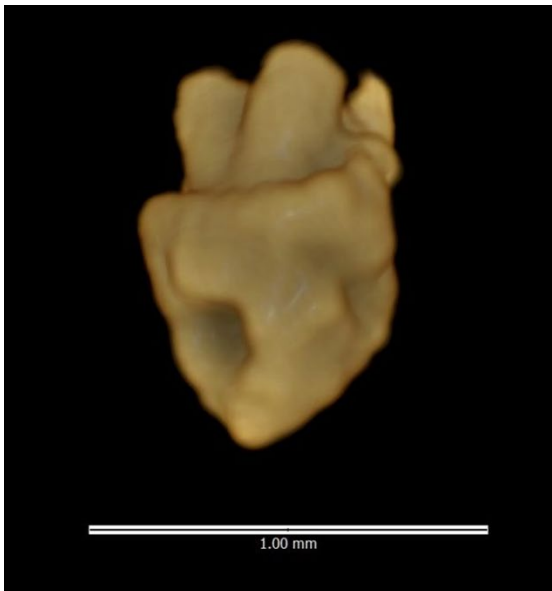
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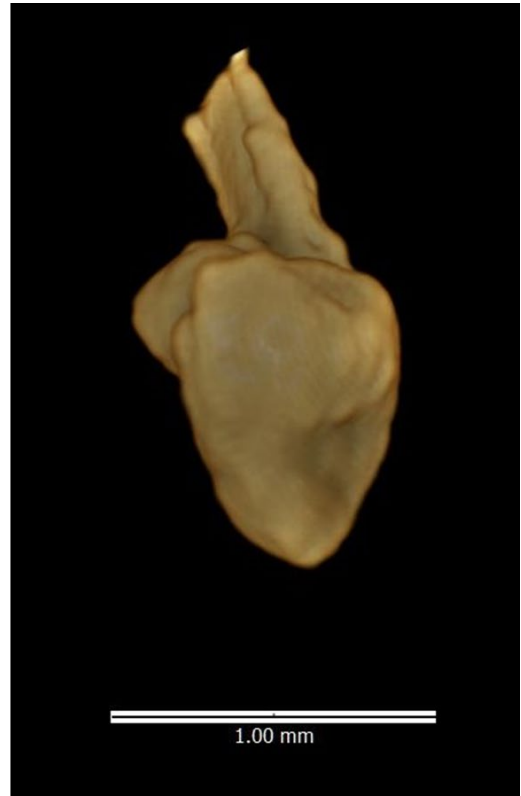
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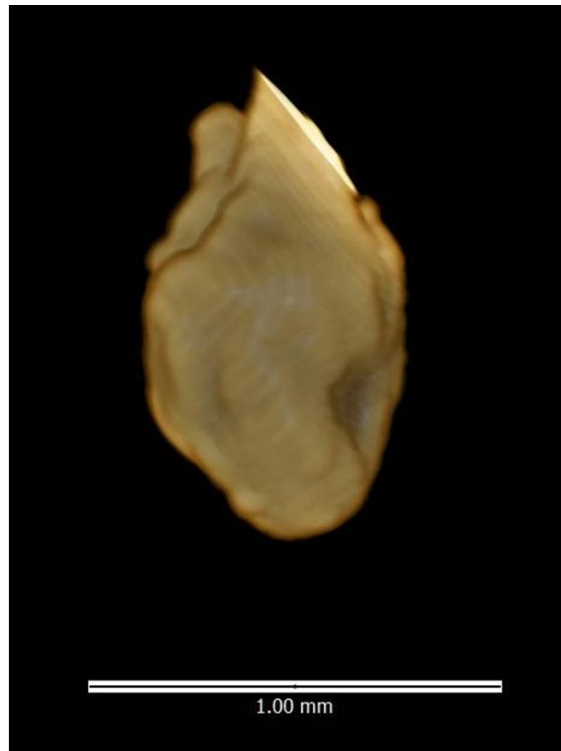
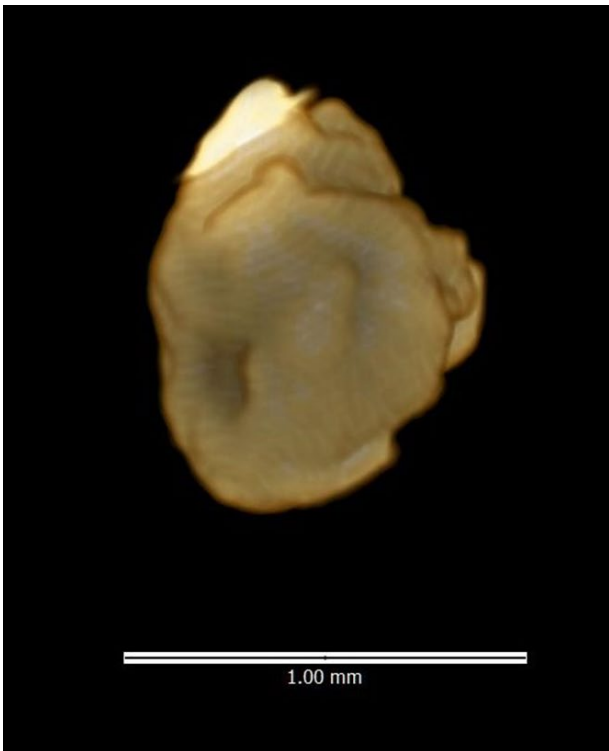
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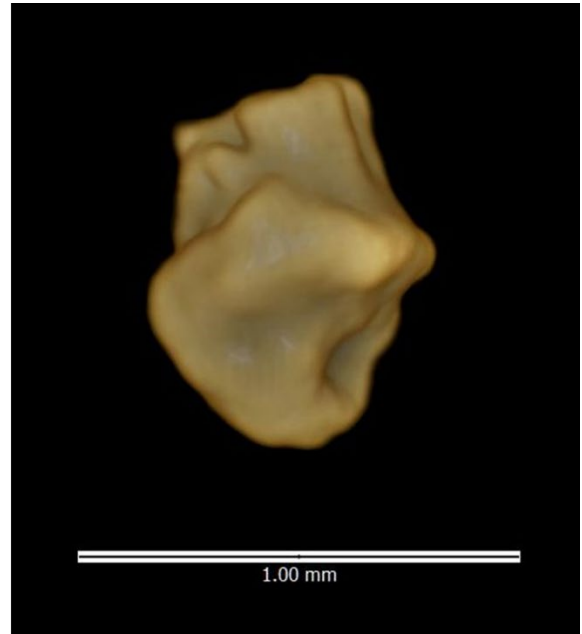
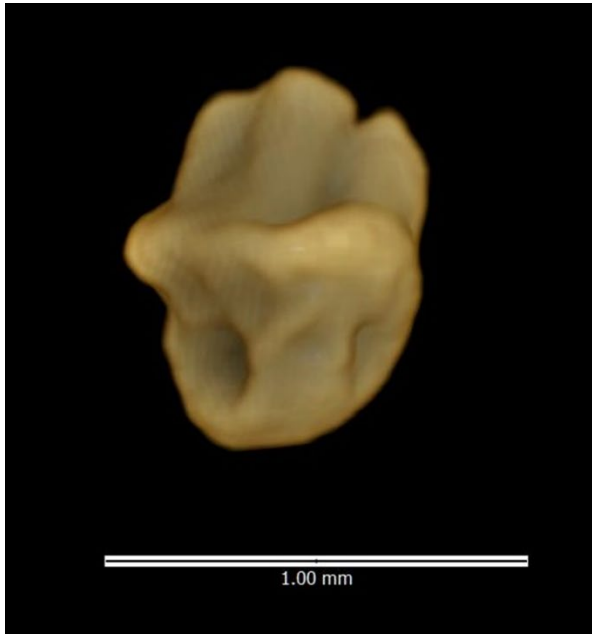
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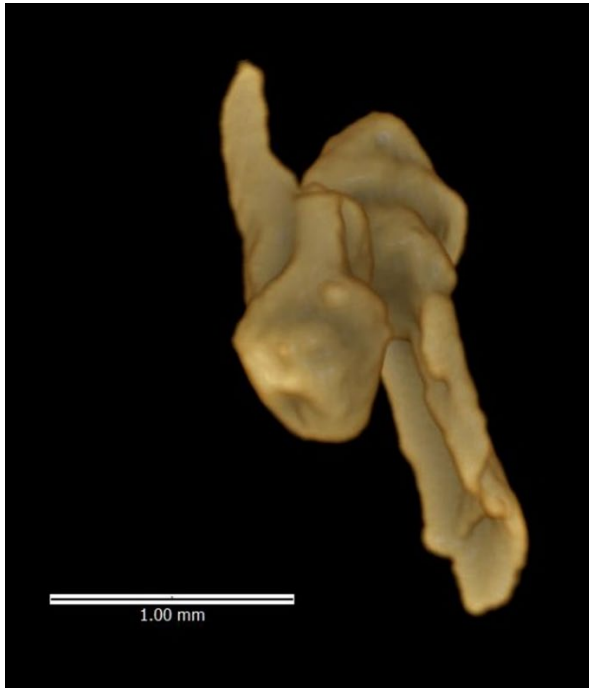
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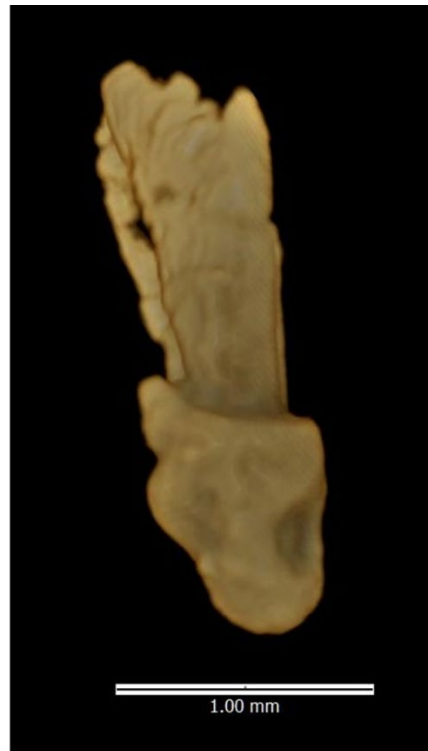
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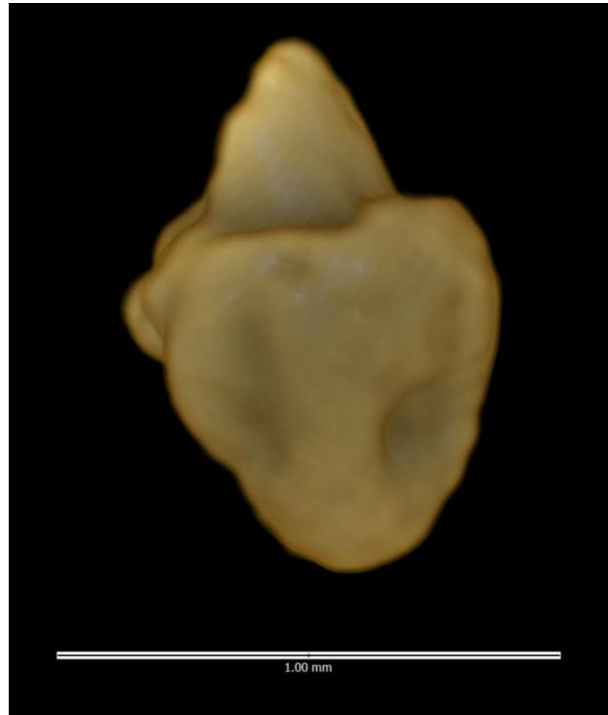
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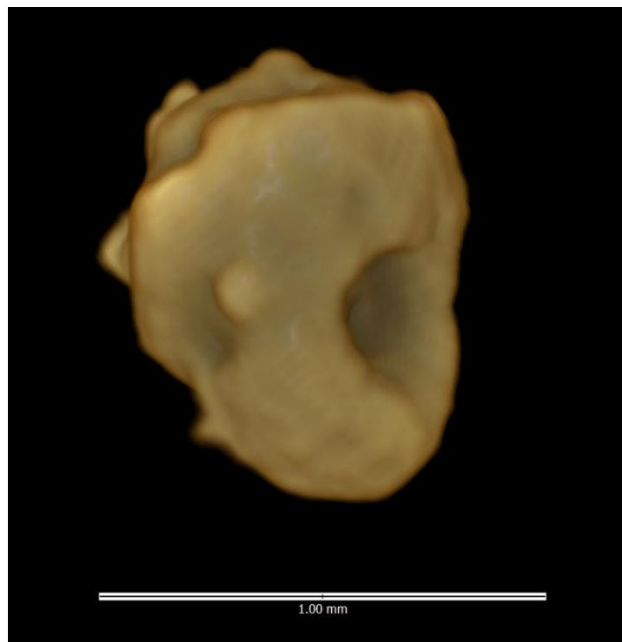
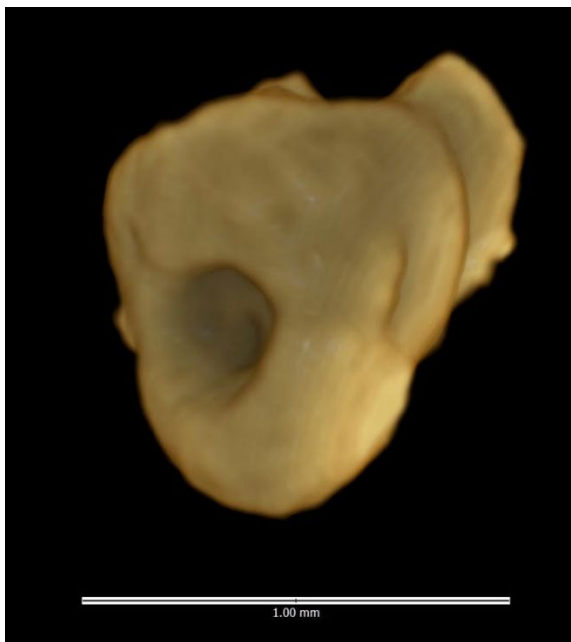
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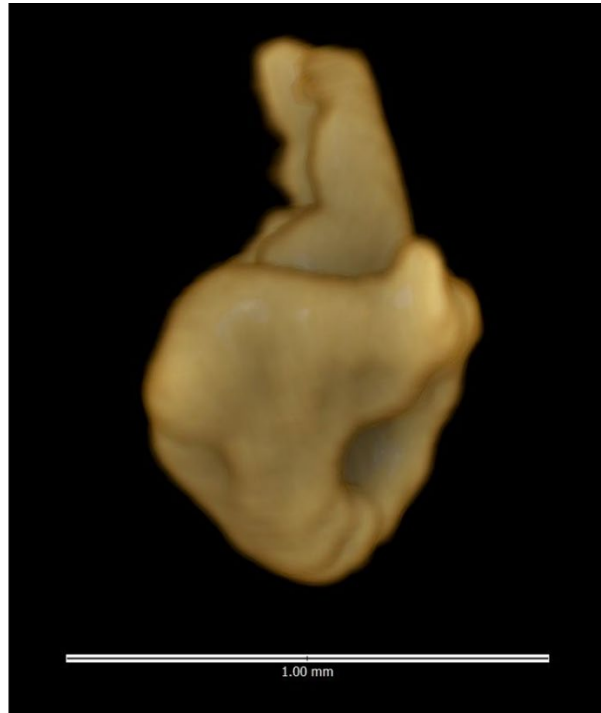
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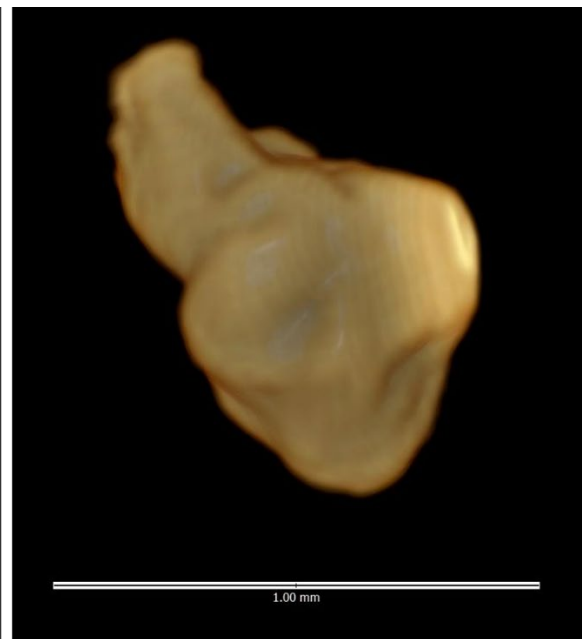
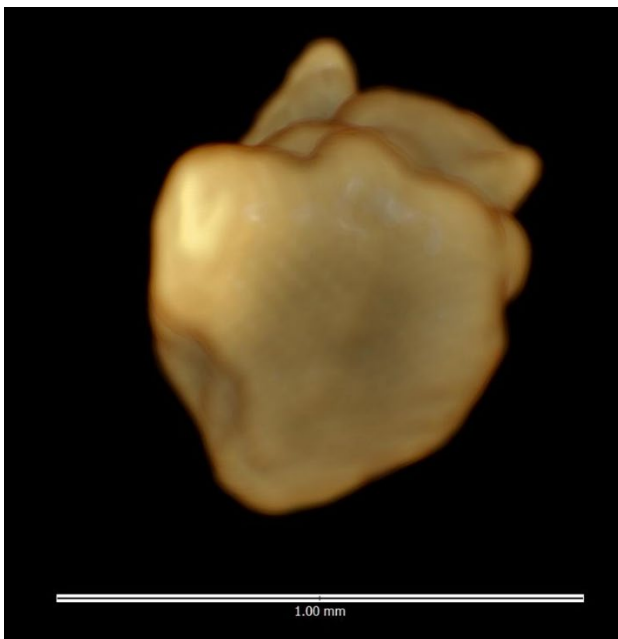
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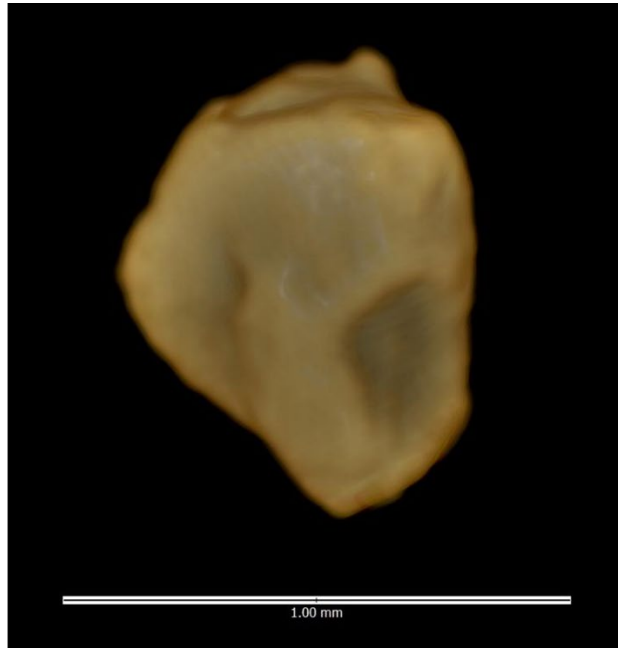
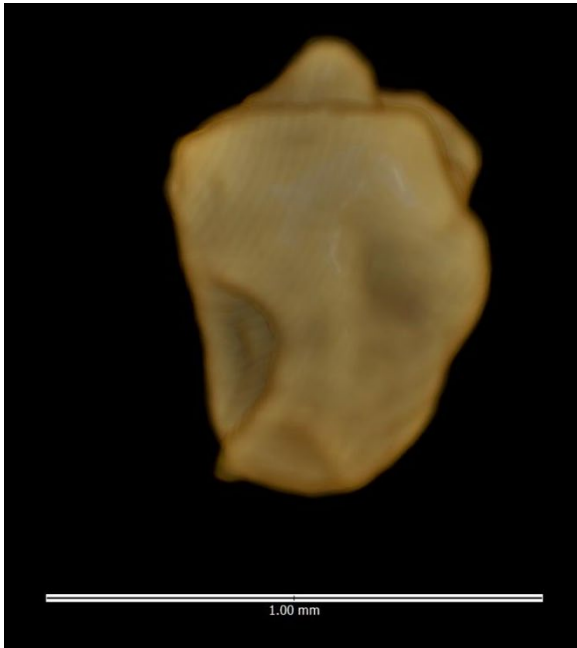
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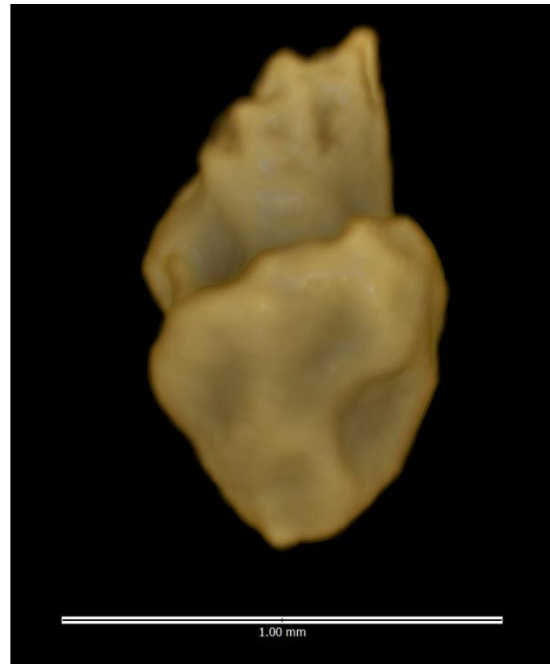
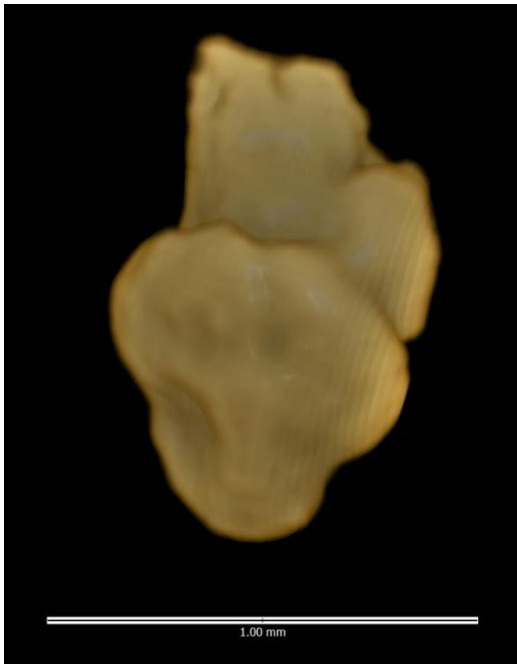
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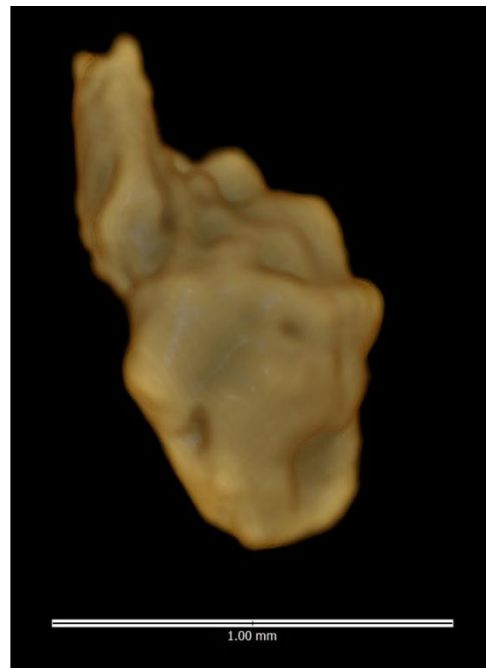
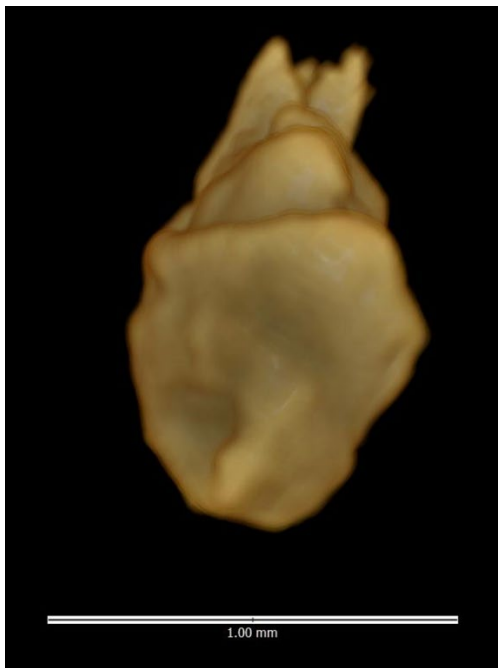
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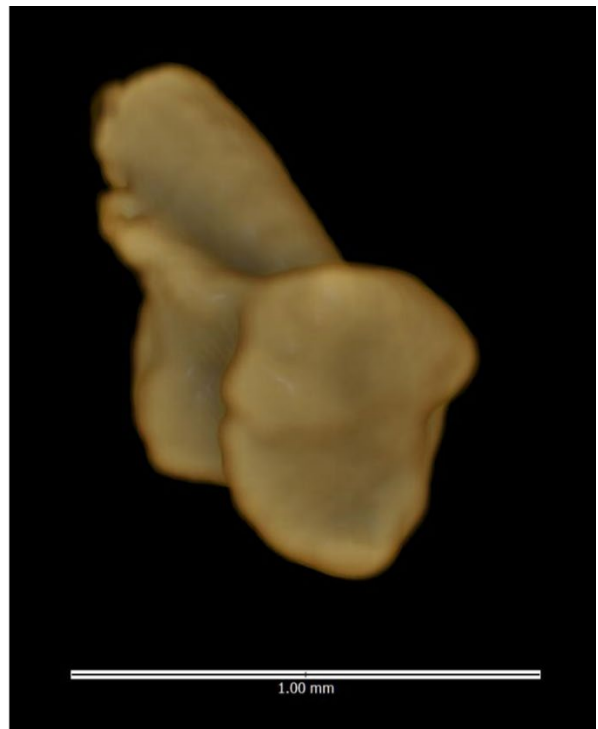
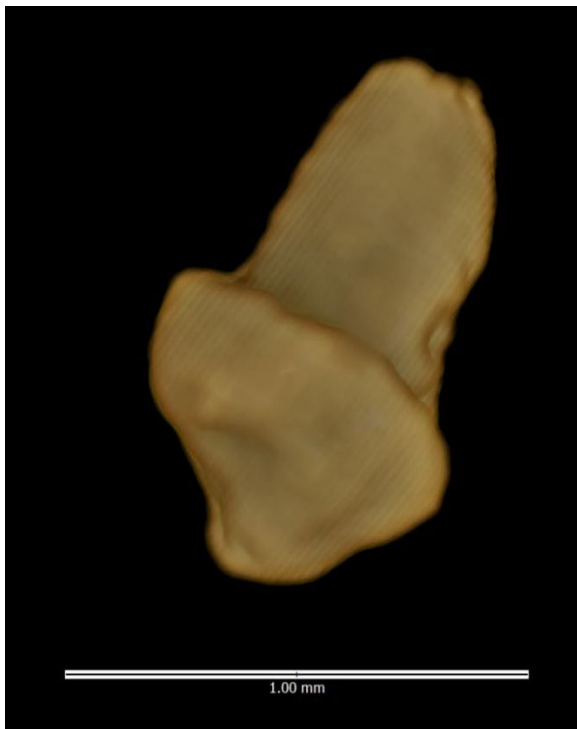
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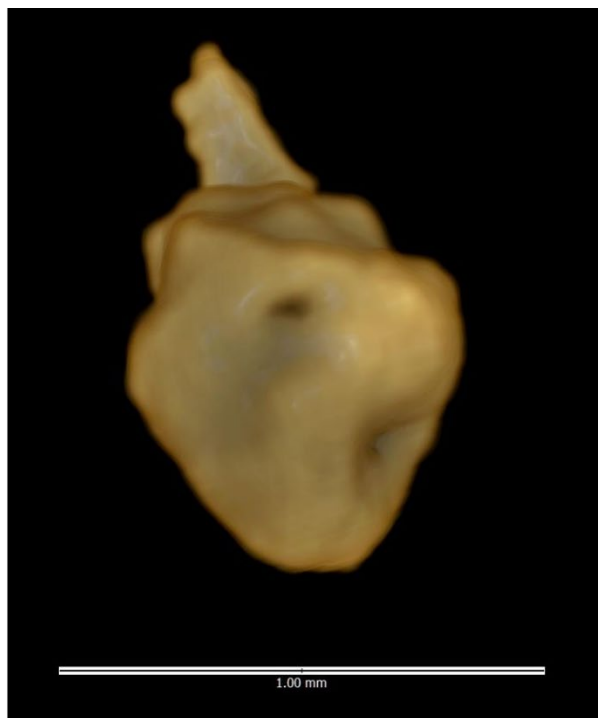
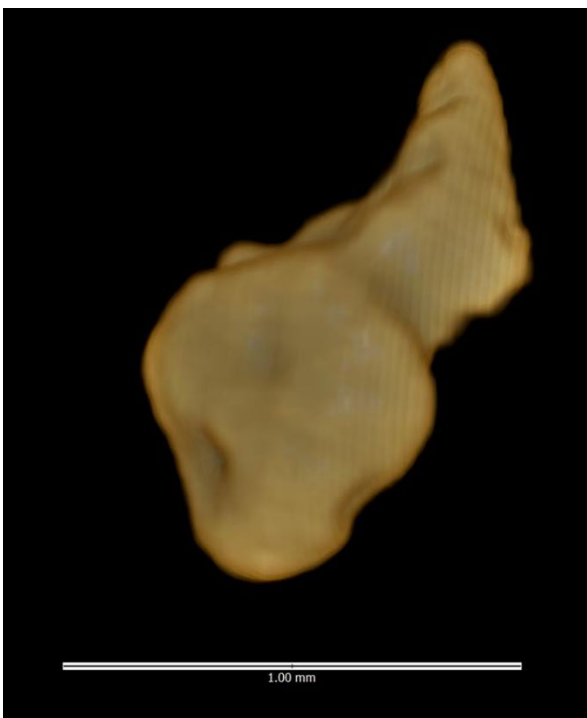
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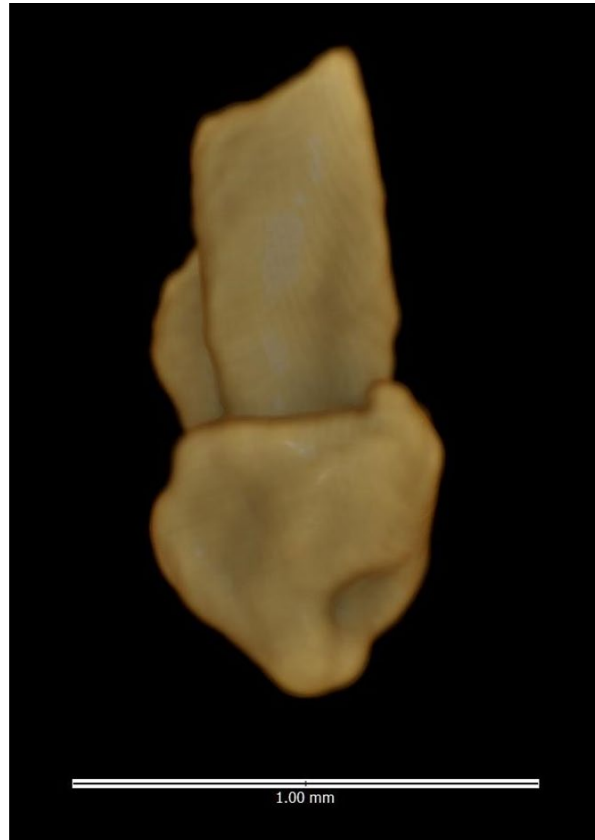
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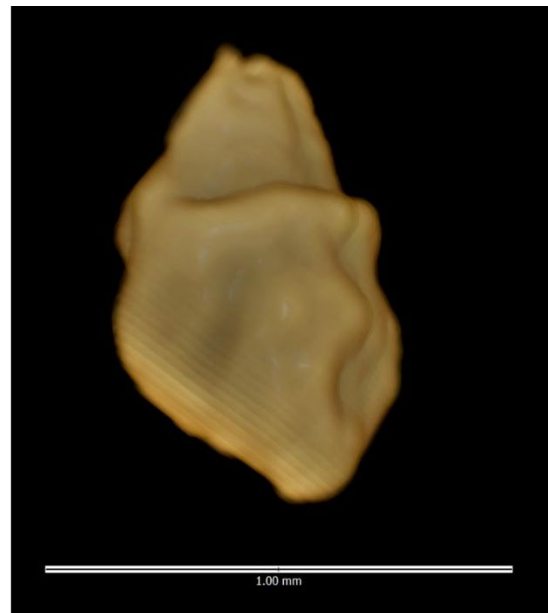
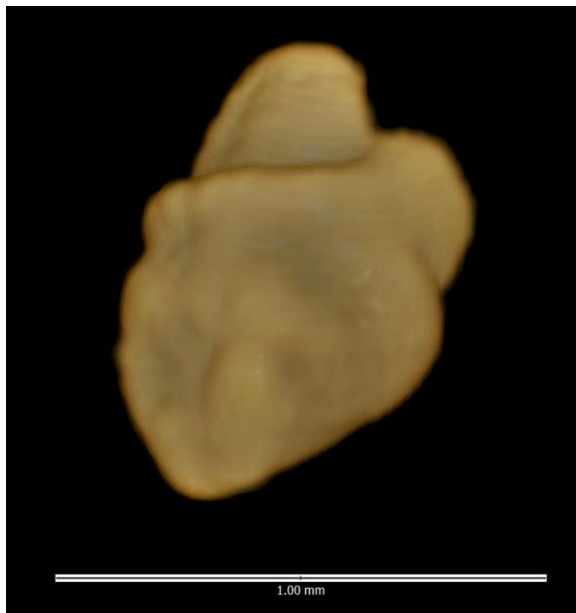
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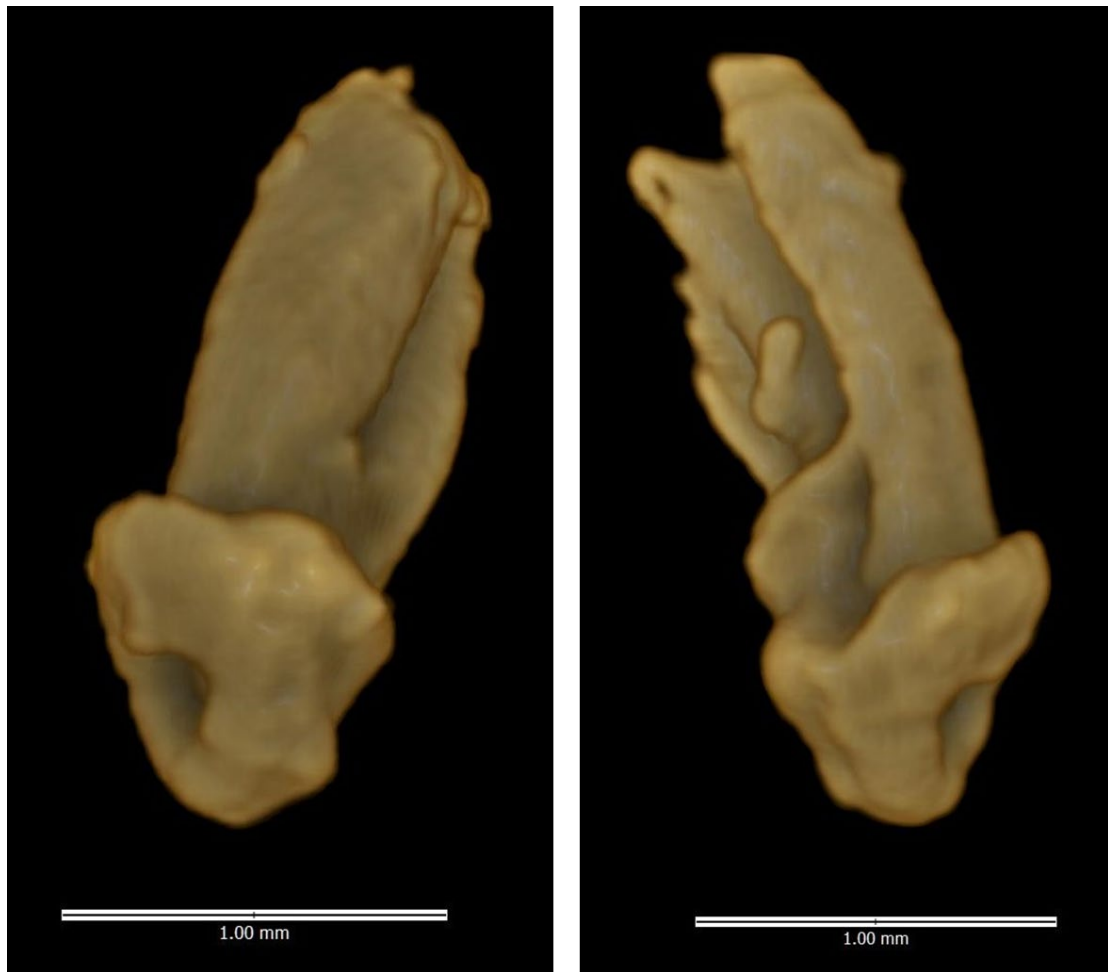
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Inclusion 55



Inclusion 56



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