Climacostomum emarginatum Stokes, 1885

Most likely ID: n.a.

Synonym: n.a.

Sampling location: Lauchsee Moor (Austria)

Phylogenetic tree: *Climacostomum emarginatum*

Diagnosis:

- body bag-shape, stocky ellipsoid
- ventral flat, dorsal convex
- length about 160 µm
- posterior end with distinct indentation
- persistome about one third of body length
- adorale zone overhang the left margin of body
- contractile vacuole terminal
- cytoplasm green due to symbiotic algae
- oblique rows of somatic kineties
- macronucleus ribbon-shaped
- terminal cilia elongated

Climacostomum emarginatum

Climacostomum emarginatum has so far only been found once in June 2025 in the Lauchsee Moor. The samples contained a large number of specimens swimming between the detritus flakes at the bottom of the samples.

The species was first described by Stokes in 1885. Kahl probably did not find the species himself, as he states that it was found in *Sphagnum* swamps in the USA. He took over the drawing and description from Stokes. The species has probably not been found and described again after Stokes, as I have not found any reference to it in the literature.

Characteristic of *Condylostoma emarginatum* is the distinct indentation at the posterior end (s. fig. 2 c) and the spirally running rows of cilia (s. figs. 3 b and 4). The peristome is clearly depressed and has an almost vertical flank on the right side. The adoral zone, which ends at the mouth opening, runs along the left side. The oral funnel of *Climacostomum emarginatum* is tubular and covered with long cilia. This tube runs in he cytoplasm to the right margin of the body, where it ends and the food vacuoles are formed (s. fig. 7 a-b).

I was able to determine the number of somatic kinetes as 30–34 (s. fig. 4). The rows of cilia are separated from each other by wide bands with very small extrusomes (s.

fig. 5) and run counterclockwise around the body. The macronucleus of the specimens in my population was mostly short sausage-shaped, but sometimes thinner and longer. I was only able to detect one spherical micronucleus, but it is difficult to see. It seems to be located in the cytoplasm at a certain distance from the macronucleus (s. fig. 8). The symbiotic algae of *Climacostomum emarginatum* seems to be from the *Chlorella* type with a cup-shaped chloroplast with pyrenoid and an own nucleus (s. fig. 9).

Climacostomum emarginatum can be confused with *Climacostomum minimum* and *Climacostomum virens*. However, *Climacostomum minimum* has no symbiotic algae and *Climacostomum virens* is twice as large, has a larger peristome, no indentation at the posterior end and the oral tube bends significantly towards the posterior end.

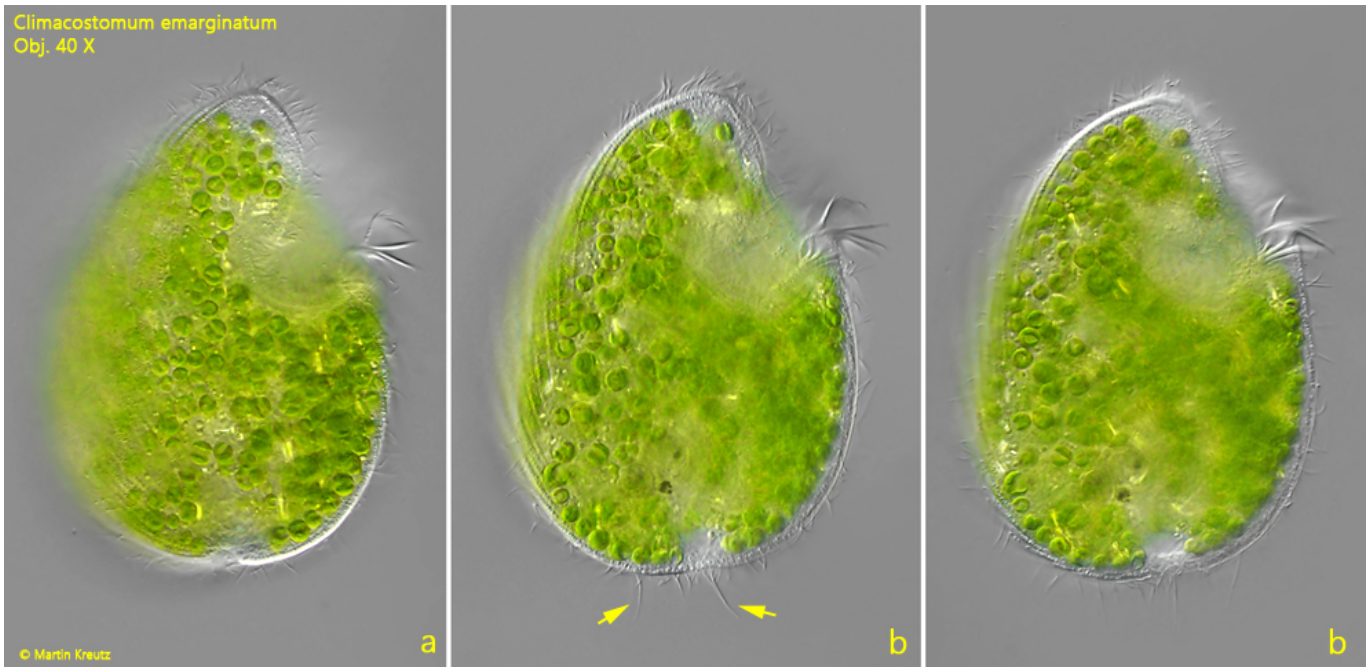

Fig. 1 a-c: *Climacostomum emarginatum*. L = 119 µm. A freely swimming specimen from right. Note the elongated, terminal cilia (arrows). Obj. 40 X.

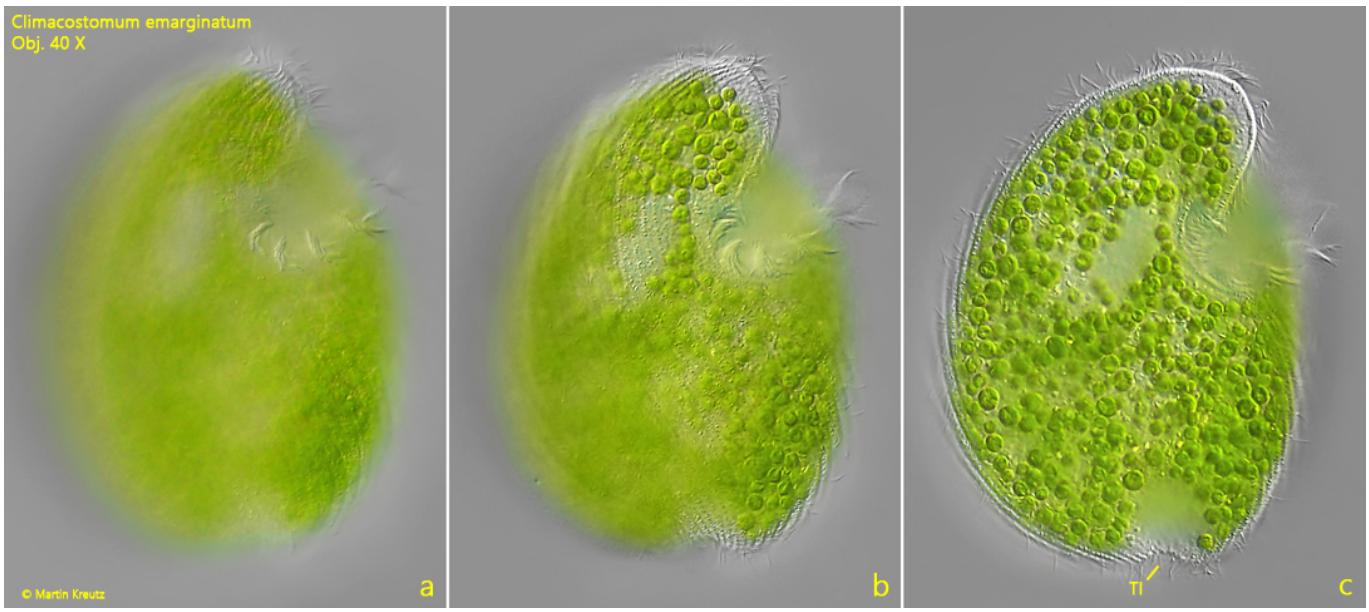

Fig. 2 a-c: *Climacostomum emarginatum*. L = 132 µm. A second freely swimming specimen from right. The posterior end has a distinct indentation (TI). Obj. 40 X.

Fig. 3 a-b: *Climacostomum emarginatum*. L = 132 µm. The slightly squashed specimen as shown in fig. 2 a-c from right. The contractile vacuole (CV) is localized at the posterior indentation. The longitudinal rows of cilia run diagonally across the body in an anticlockwise direction. Obj. 60 X.

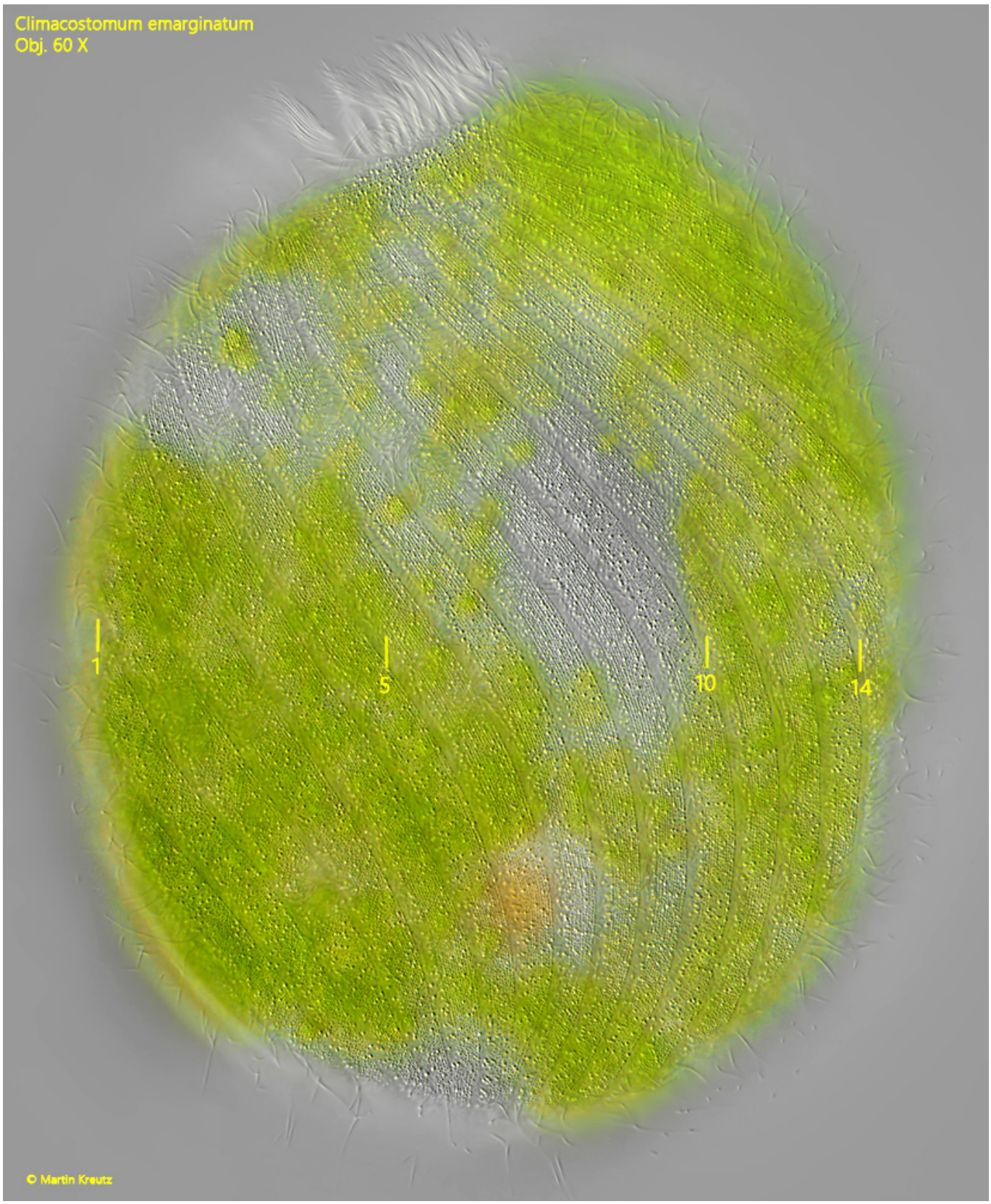

Fig. 4: *Climacostomum emarginatum*. A squashed specimen from dorsal. The number of visible longitudinal rows of cilia is 14. The total number of ciliary rows on the body is therefore 30-34. Obj. 60 X.

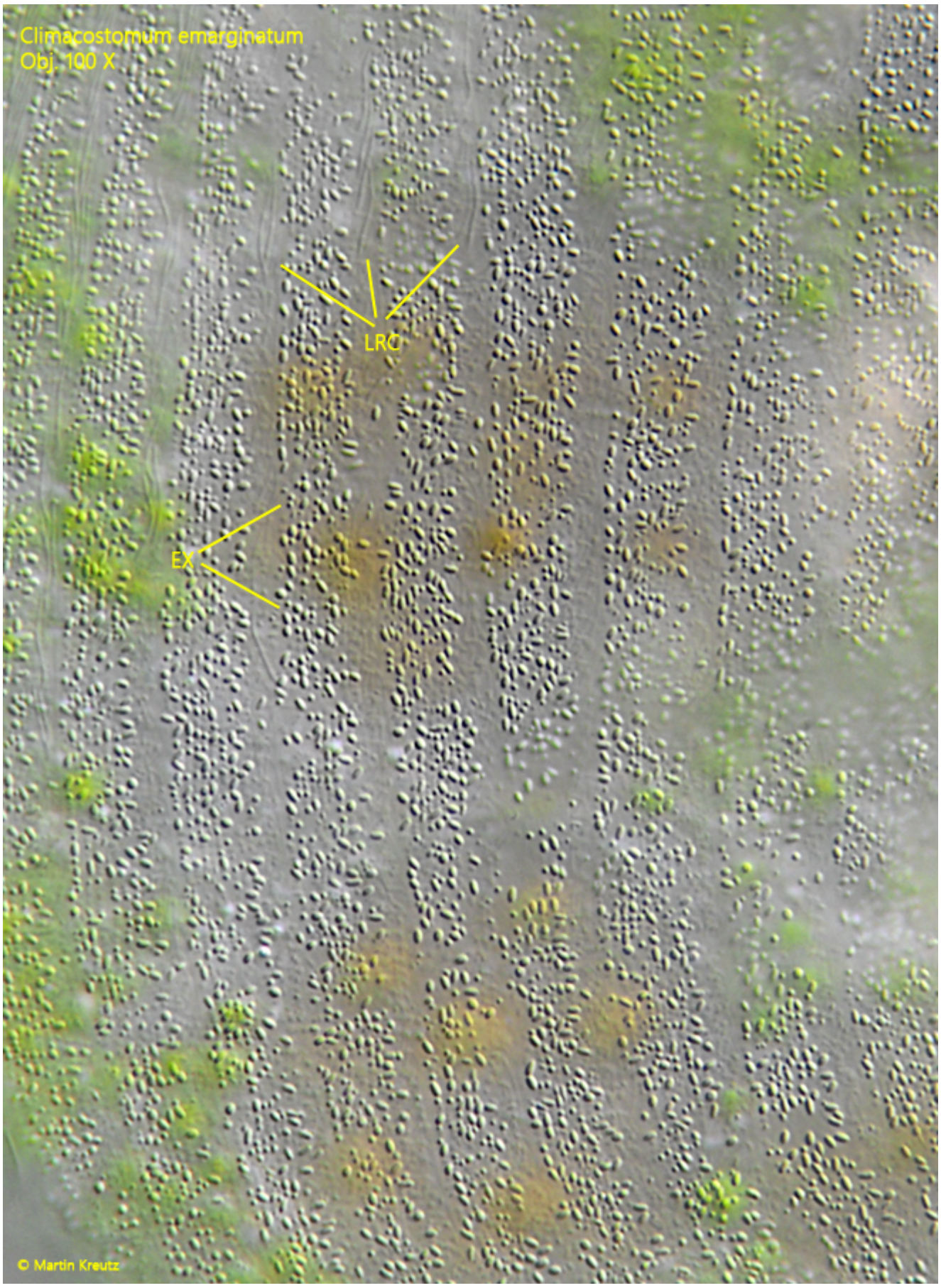

Fig. 5: *Climacostomum emarginatum*. Between the longitudinal rows of cilia (LRC) bands with irregularly arranged extrusomes (EX) are located. The extrusomes have

a length of 1–2 µm. Obj. 100 X.

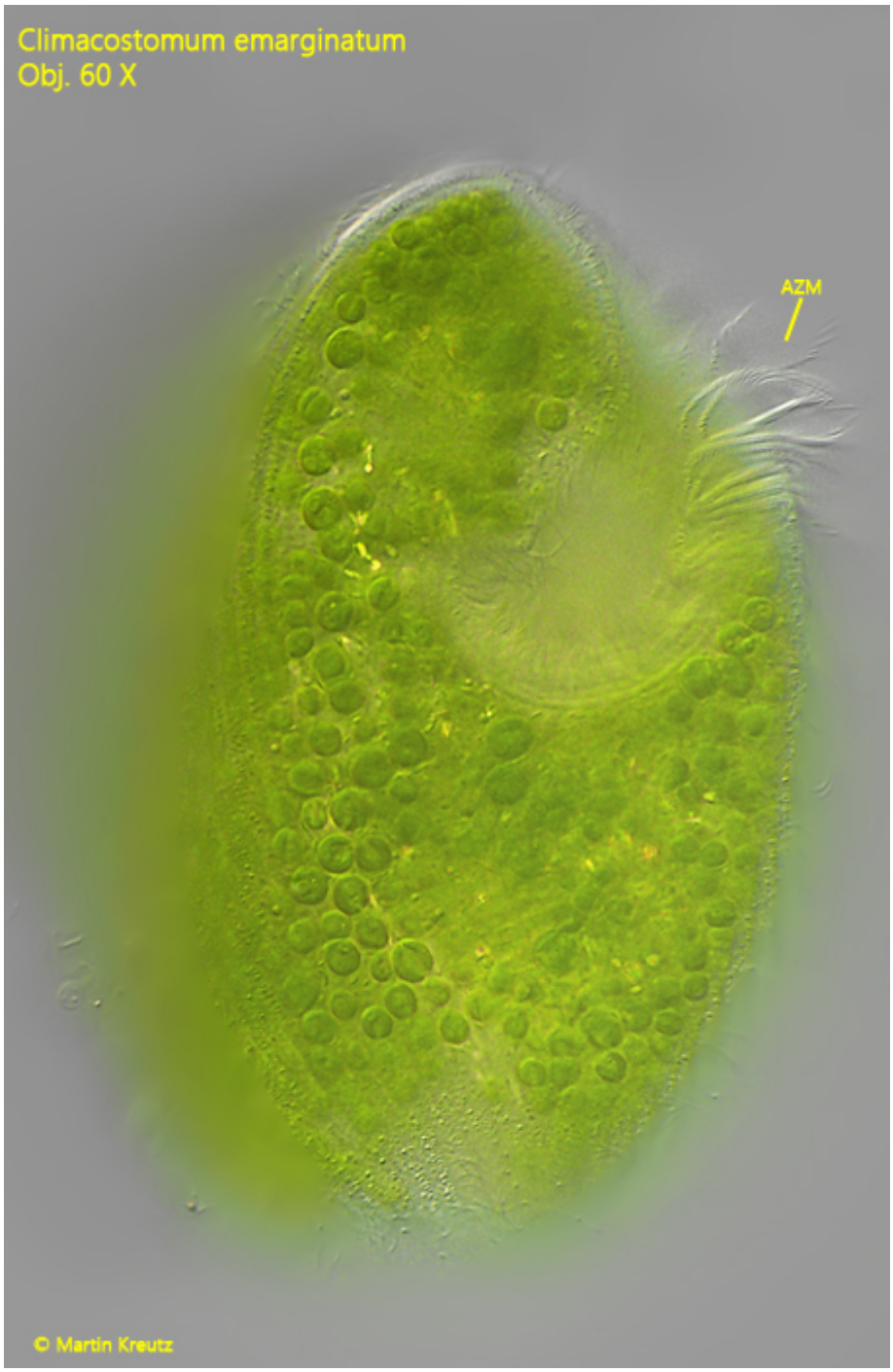

Fig. 6: *Climacostomum emarginatum*. Ventral view of a slightly squashed specimen. On the left margin of the oral apparatus the adoral zone of membranelles (AZM) is visible. Obj. 60 X.

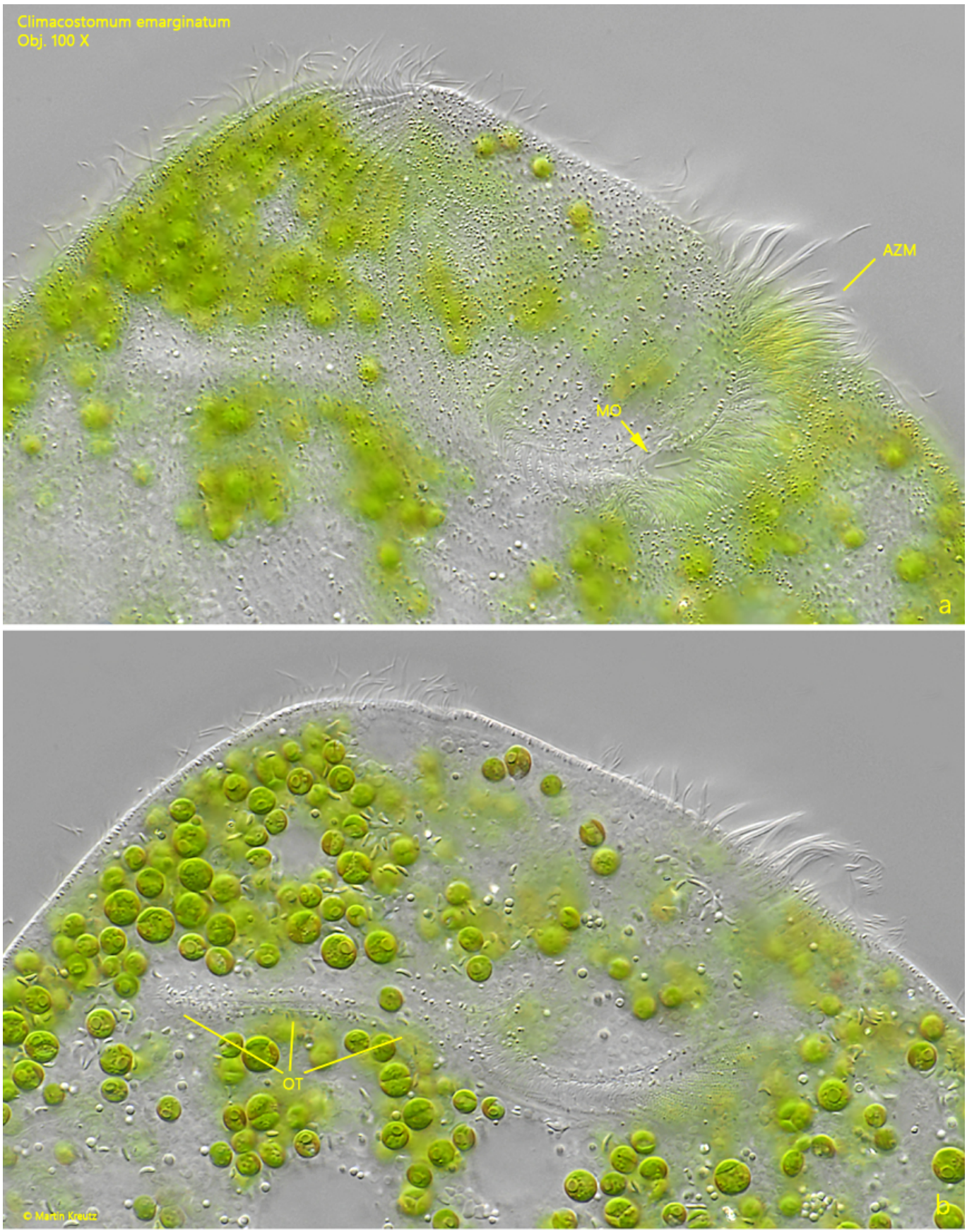

Fig. 7 a-b: *Climacostomum emarginatum*. Two focal planes of the oral apparatus from ventral. The adoral zone of membranelles (AZM) ends at the mouth opening (MO). From there an oral tube (OT) covered with cilia runs to the right side of the body where it ends. Obj. 100 X.

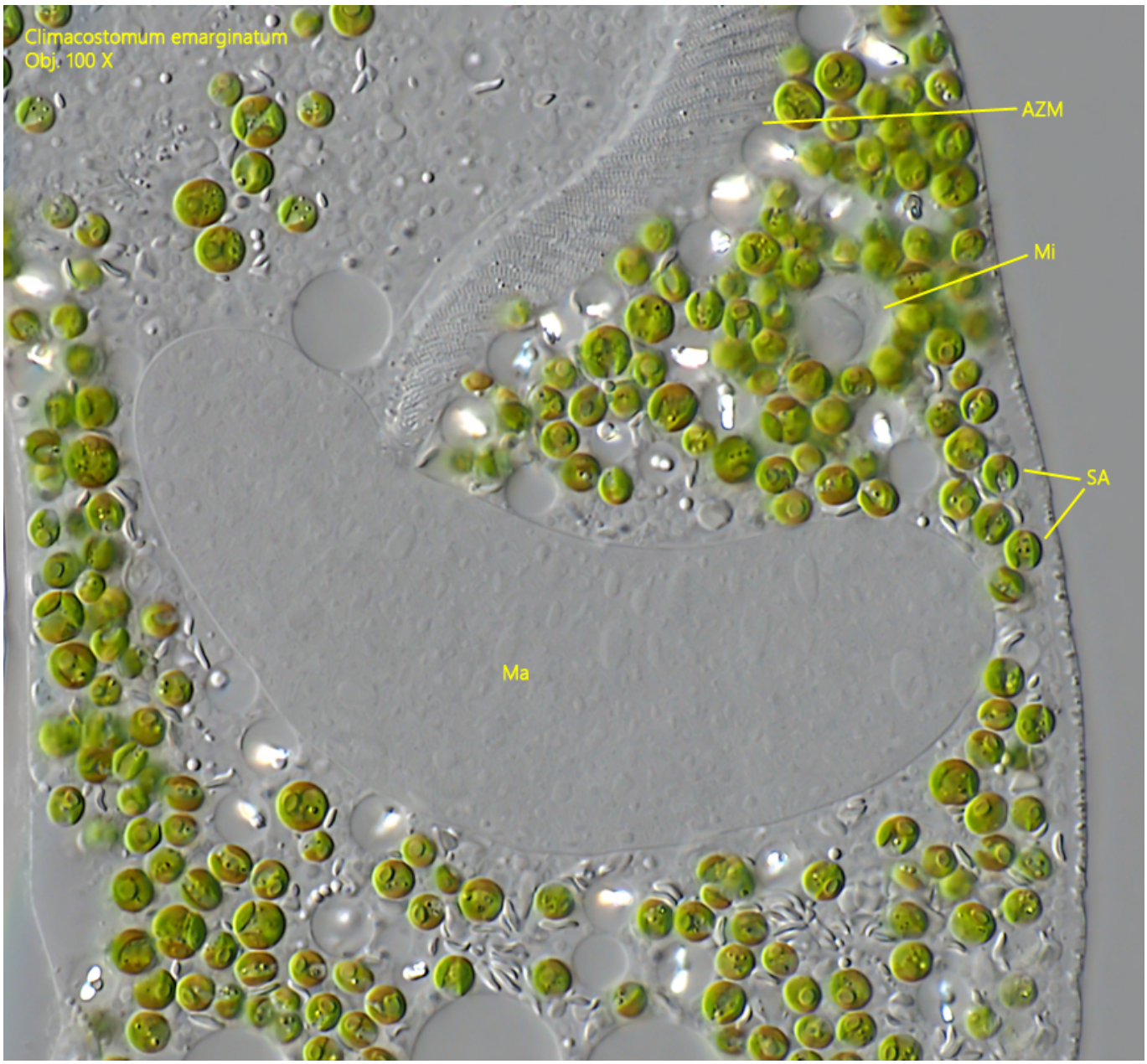

Fig. 8: *Climacostomum emarginatum*. The sausage-shaped macronucleus and the separated micronucleus (Mi) in a squashed specimen. AZM = adoral zone of membranelles, SA = symbiotic algae. Obj. 100 X.

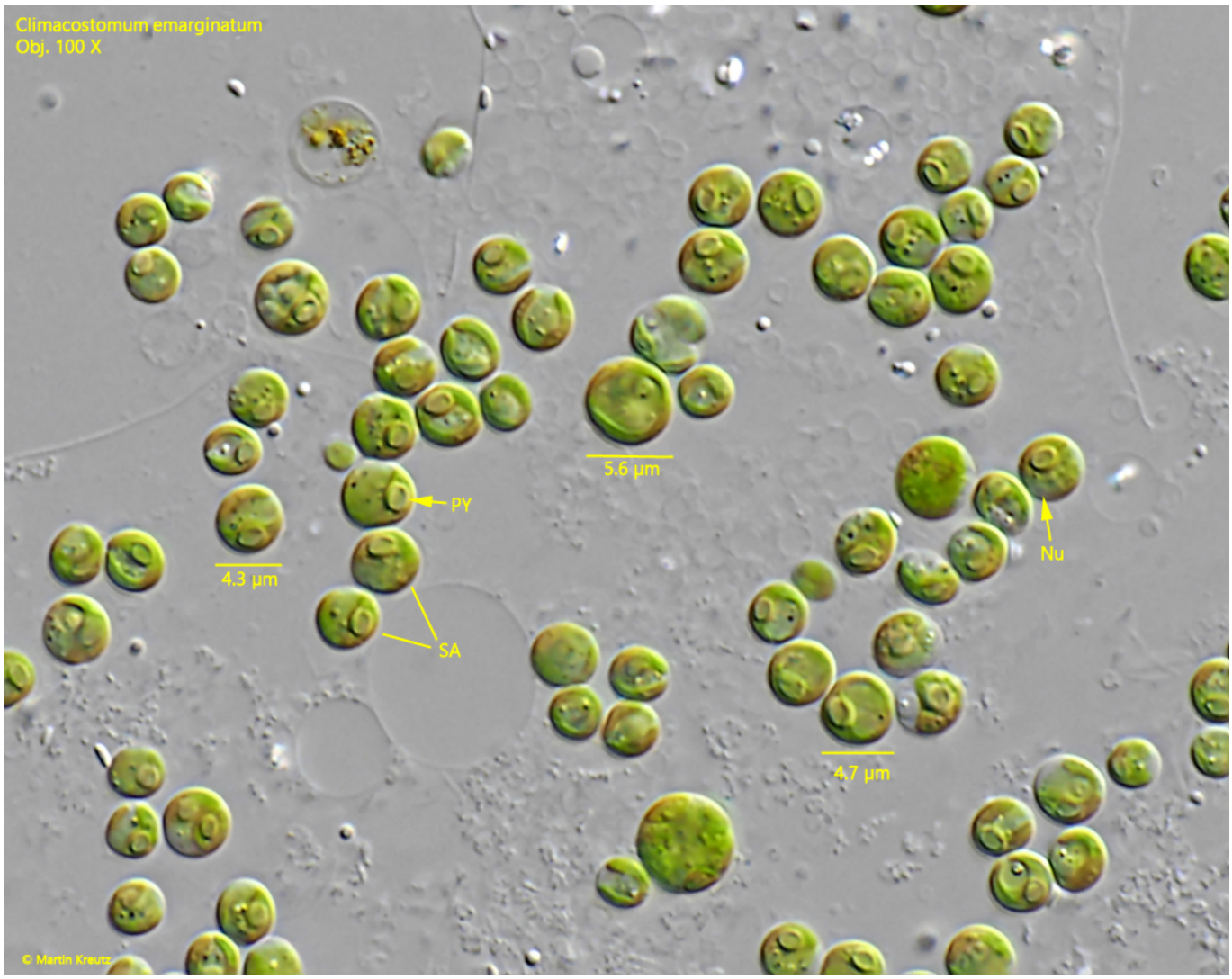

Fig. 9: *Climacostomum emarginatum*. The symbiotic algae have a pyrenoid (PY), a cup-shaped chloroplast and a nucleus (Nu). The diameter of the algae cells is 4–6 µm. Obj. 100 X.