Disematostoma buetschlii

Lauterborn, 1894

Most likely ID: n.a.

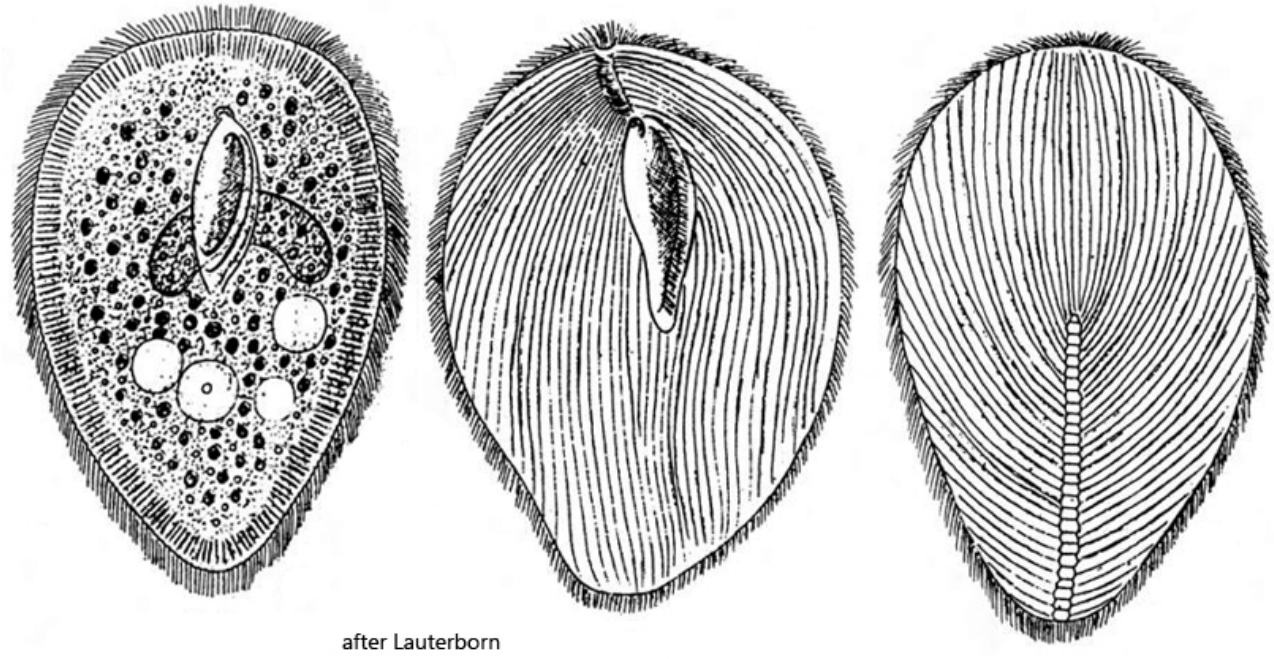
Synonym: n.a.

Sampling location: Simmelried, Mühlhalden pond

Phylogenetic tree: *Disematostoma buetschlii*

Diagnosis:

- body obovoidal or pyriform
- ventral surface flat, dorsal curved
- length 110–200 µm
- oral aperture one third down from anterior end
- ladder-like preoral and postoral suture
- The postoral suture reaches center of dorsal side.
- macronucleus near mid-body-reniform or C-shaped
- 3-4 spherical micronuclei adjacent to macronucleus
- fringe of distinct extrusomes (about 10 µm) beneath pellicle
- contractile vacuole subequatorial with collecting canals
- one excretion porus of contractile vacuole dorsal
- cytoplasm green due to symbiotic algae (winter form colorless)
- planktonic lifestyle



Disematostoma buetschlii

I have only found *Disematostoma buetschlii* three times so far. Although it is a planktonic species, I found isolated specimens in June 2015 and June 2018 in the Simmelried between floating plant masses. In August 2024, I then found a mass development in the plankton of the Mühlhalden pond. Lauterborn and Kahl found their specimens between April and November, which led them to suspect a winter form. I cannot confirm this observation.

The shape of free-swimming specimens is ventrally similar to that of *Frontonia atra*, with a tapered posterior end. The swimming speed of *Disematostoma buetschlii* is very fast, which means that details can only be examined in fixed specimens. The mouth opening in the anterior third is channel-shaped. On the left side there are adoral membranelles and on the right side several rows of cilia, which form the undulating membrane (s. fig. 4).

The macronucleus was always C-shaped in my population (s. fig. 7). It deforms and denatures quickly under coverslip pressure. The round micronuclei, which are adjacent to the macronucleus, are difficult to find because they also denature quickly. According to Martin-Gonzalez, Serrano, and Fernandez-Galiano (1990) there should be 3–4 micronuclei. In my specimens, however, I could only find two micronucle (s. fig. 8) or one micronucleus (s. fig. 9). Due to the instability described, however, I may have overlooked micronuclei.

Above the mouth opening runs a ladder-shaped preoral suture, which runs to the apical pole (s. figs. 3 b and 5). In squashed specimens it can be easily recognized. Below the mouth opening, near the posterior end, a postoral suture arises, which runs to the posterior end

and reaches up to the middle of the dorsal side (s. fig. 6). At the end of the postoral suture the excretorion porus of the contractile vacuole is visible to the left (s. fig. 6).

In most of the specimens I found symbiotic algae, which accumulated especially in the apical end. At high magnification it can be seen that these are xanthophytes. The cells are spherical with a diameter of 8–9 µm. The cell wall is finely punctured. The protoplasm contains brick-red oil droplets, which are typical for xanthophytes. I could not find any information about the symbiotic algae in *Dematostoma buetschlii* in the literature. Possibly these algae are member of the genus *Chlorobotrys*. Kahl (1931) observed that the symbiotic algae disappear in winter and the specimens are then colorless. However, the number of symbiotic algae also seems to fluctuate greatly in the summer months. I was able to find some with very few algae cells among many green specimens.

It is easy to confuse *Dematostoma buetschlii* with the similar species *Stokesia vernalis*. However, *Stokesia vernalis* has a hump-shaped dorsal side and therefore appears cap-shaped when swimming in lateral view. In addition, the macronucleus is elliptical and not curved. *Stokesia vernalis* also has 3–5 excretory pores of the contractile vacuole and not one, as in *Dematostoma buetschlii*.

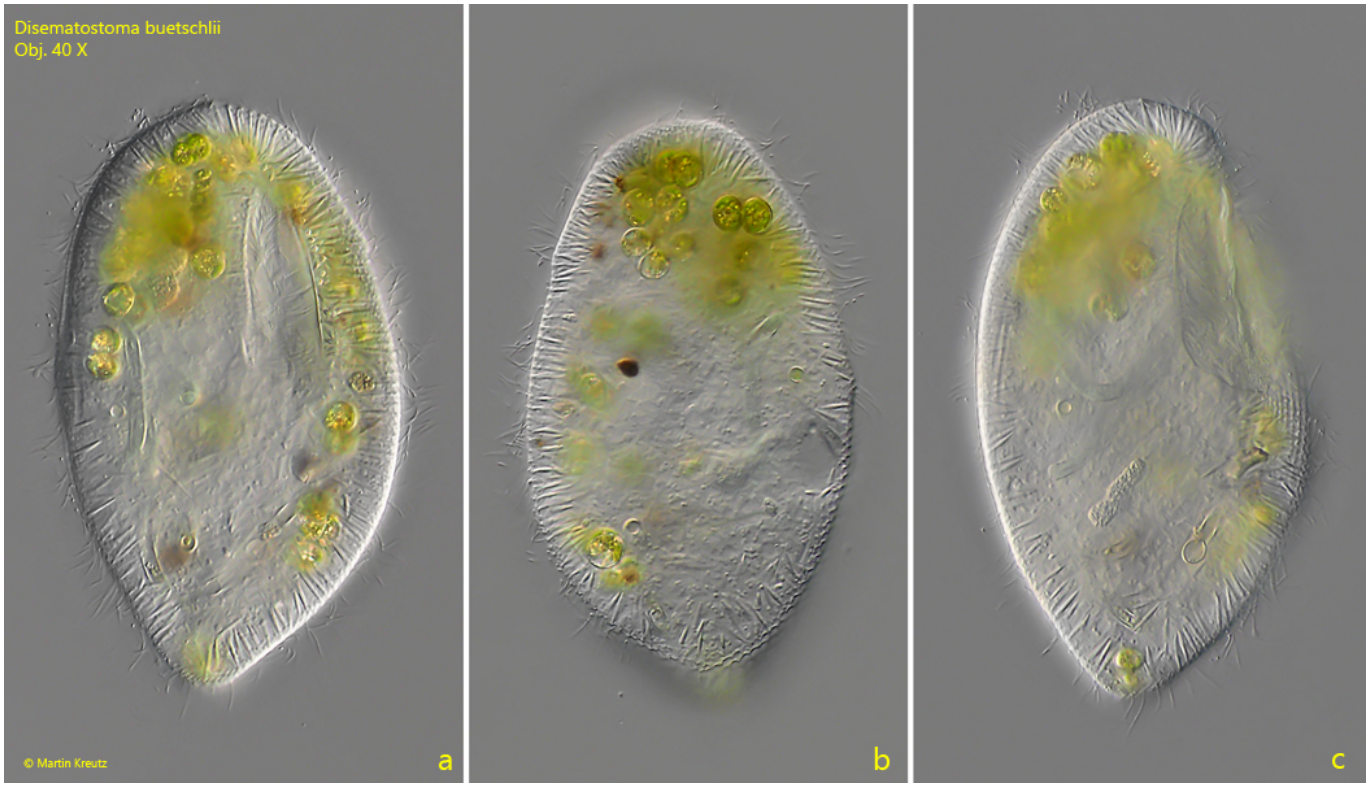


Fig. 1 a-c: *Dematostoma buetschlii*. L = 162 µm. A freely swimming specimen from ventral (a, b) and from right (c). Obj. 40 X.

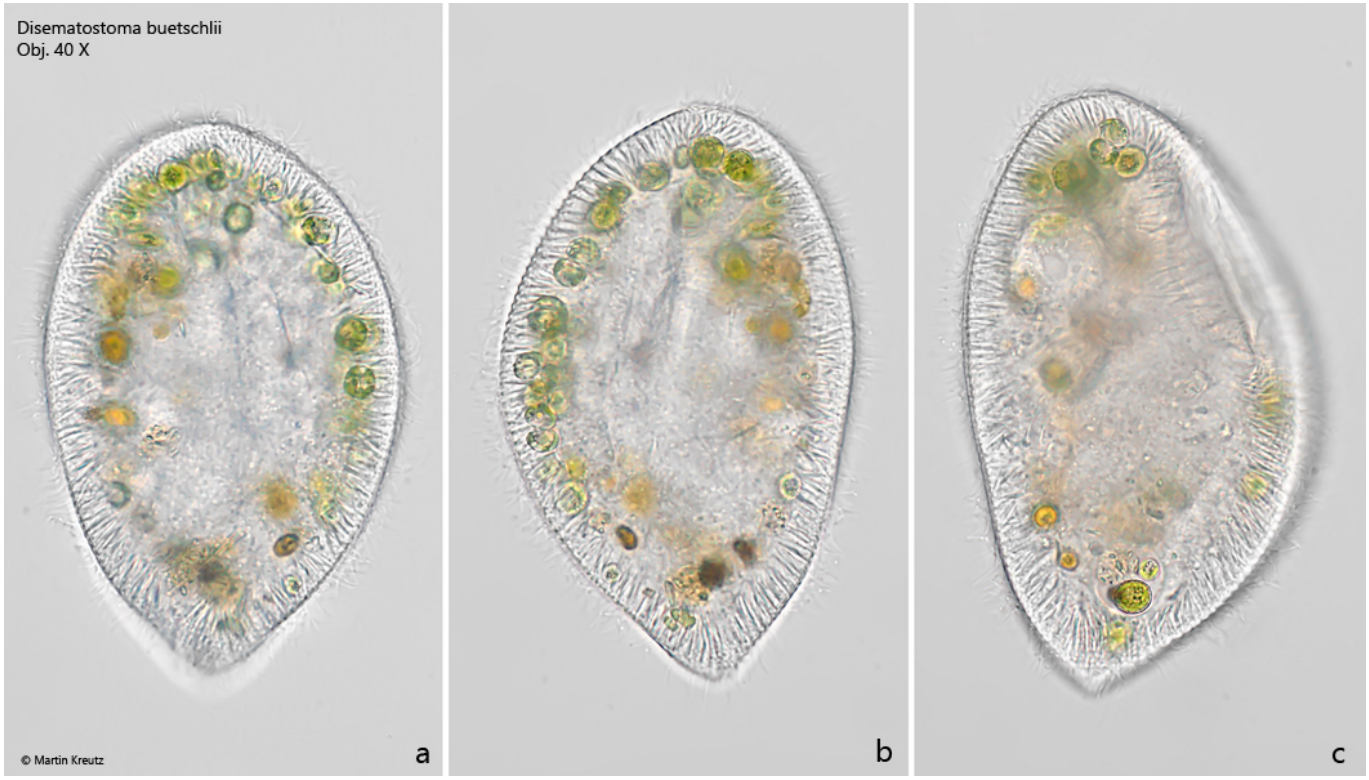


Fig. 2 a-c: *Disematostoma buetschlii*. L = 150 µm. A second freely swimming specimen from ventral (a, b) and from right (c) in brightfield illumination. Obj. 40 X.

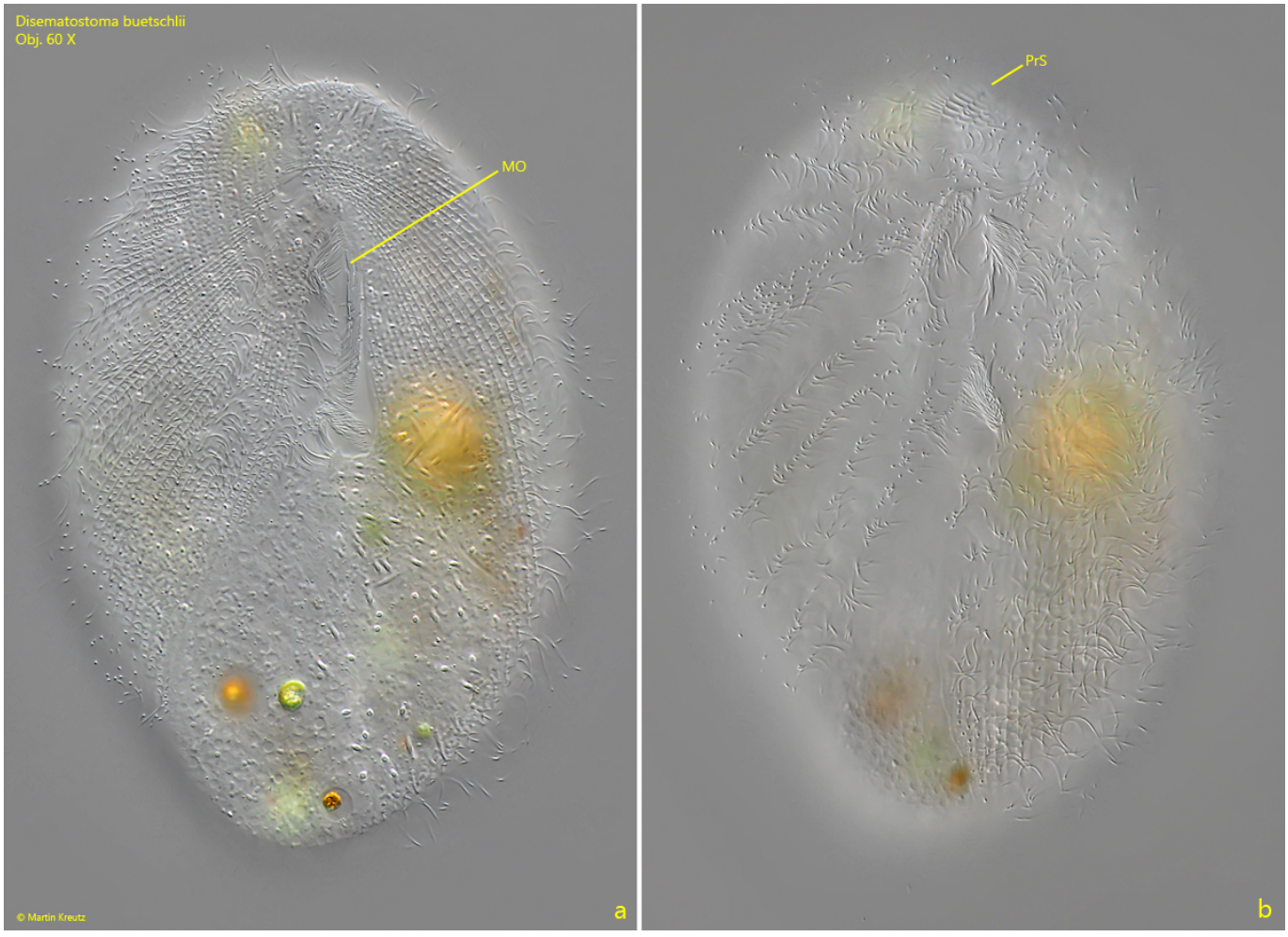


Fig. 3 a-b: *Disematostoma buetschlii*. Two focal planes of a slightly squashed specimen from ventral. Note the apical preoral suture (PrS). MO = mouth opening. Obj. 60 X.

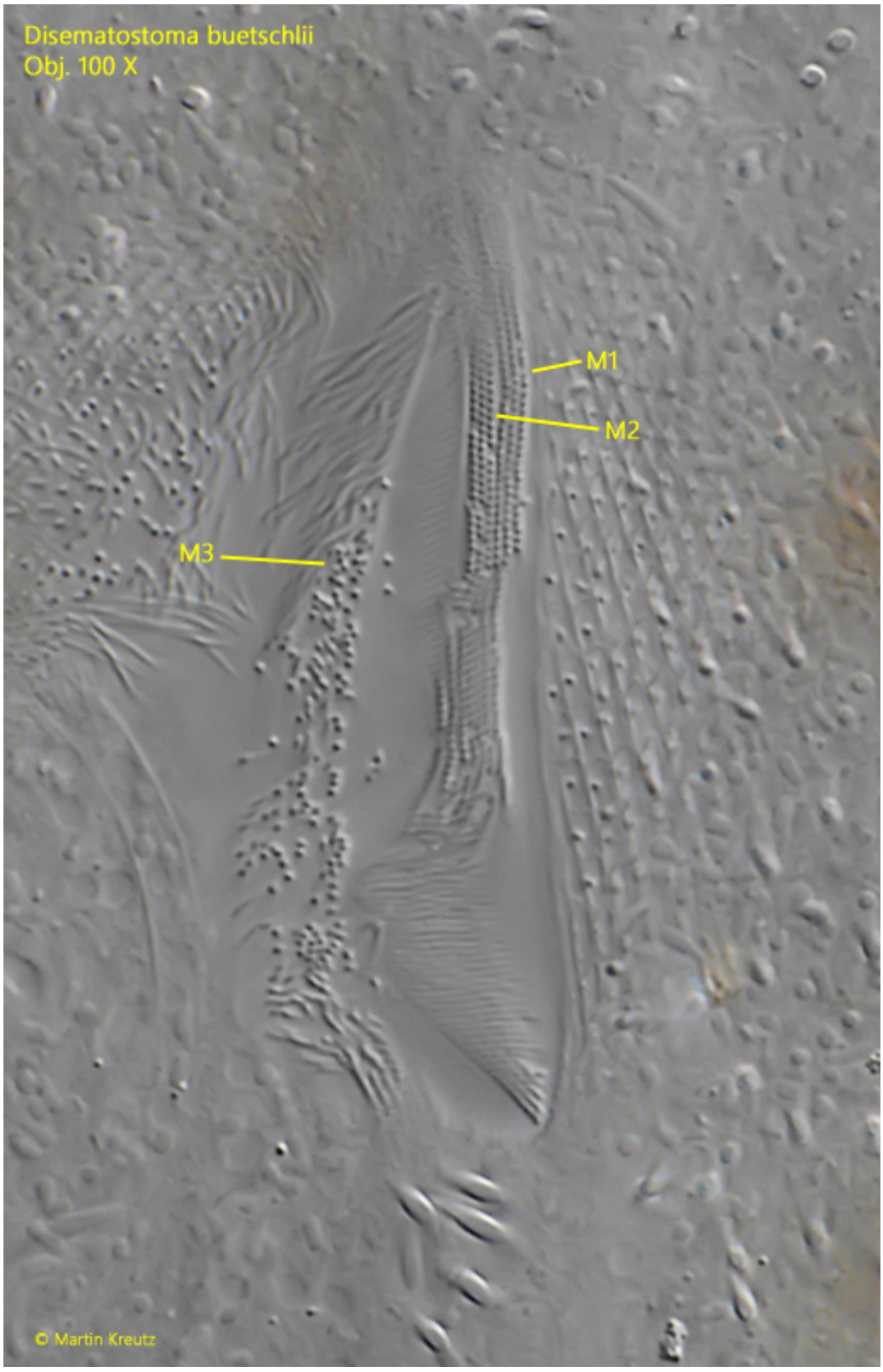


Fig. 4: *Disematostoma buetschlii*. The mouth opening in detail. The oral apparatus is a longitudinal groove. On the ground of the grrove the broad adoral membranelle M3 is located. The two thin stripes of the membranlles M2 and M3 are on the right side. Obj. 100 X.

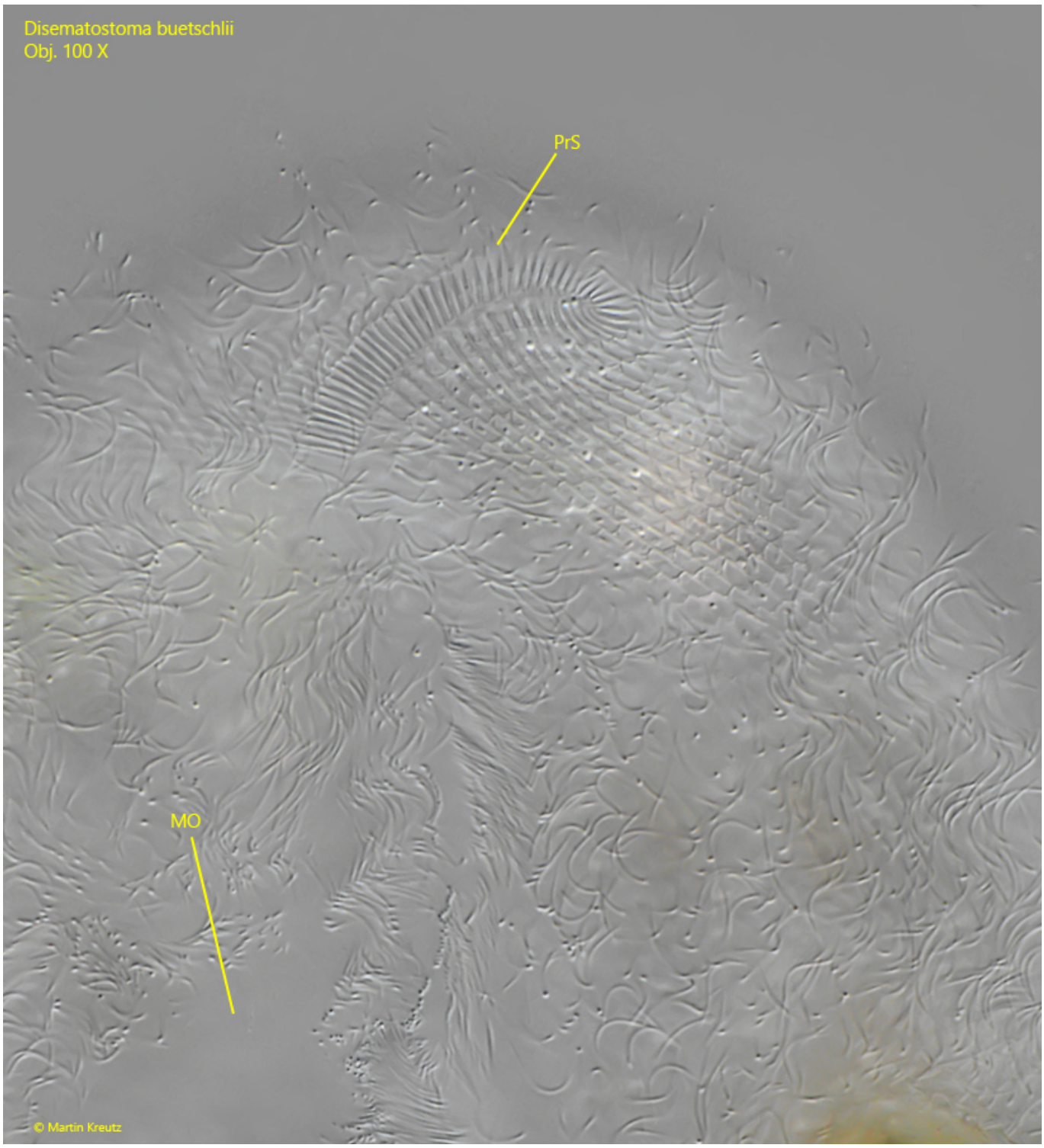


Fig. 5: *Disematostoma buetschlii*. The apically located preoral suture (PrS) with a ladder-structure in detail. MO = mouth opening. Obj. 100 X.

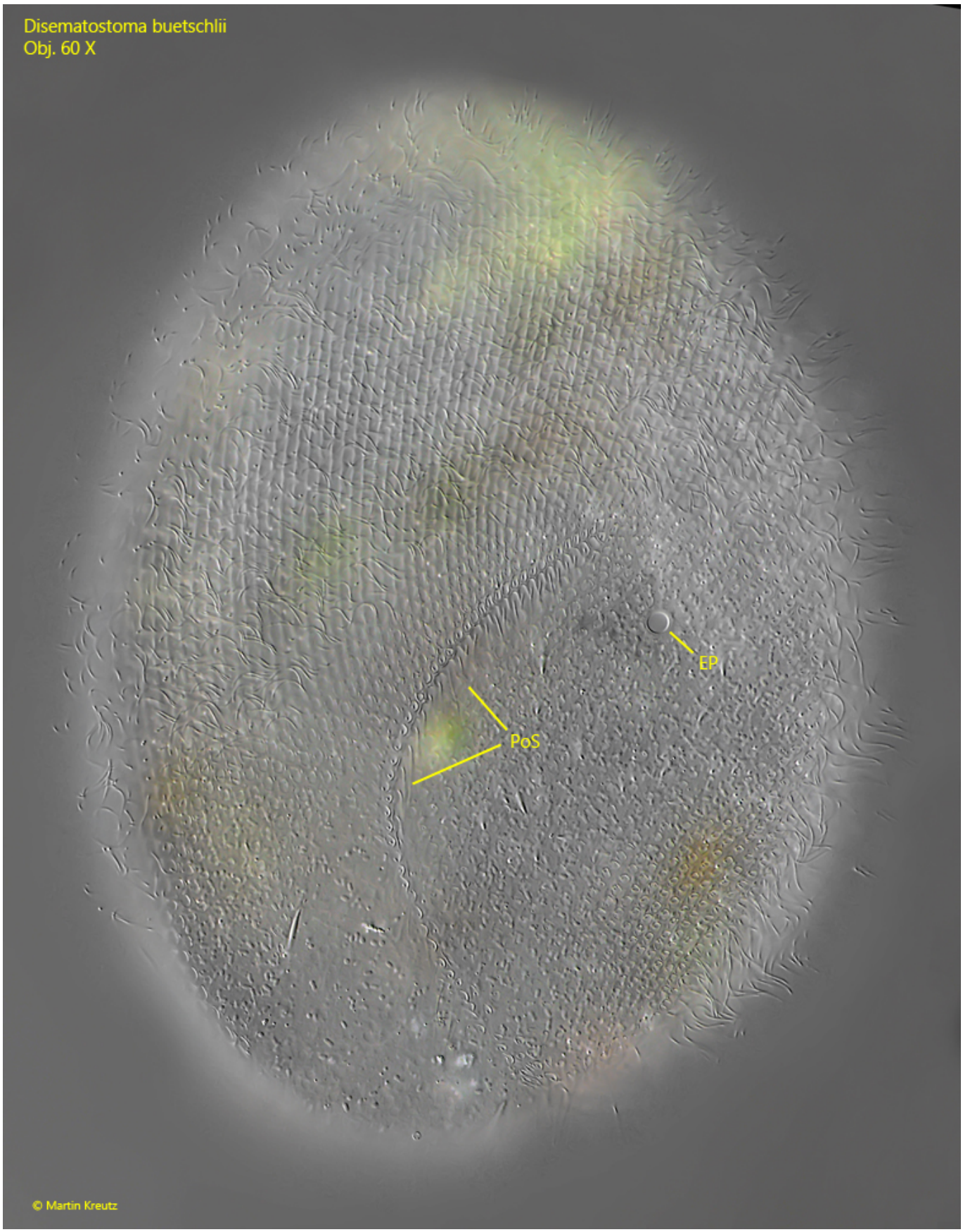


Fig. 6: *Disematostoma buetschlii*. A squashed specimen from dorsal. Note the postoral suture (PoS) reaching the center of the dorsal side and the excretion porus (EP) of the contractile vacuole. Obj. 100 X.

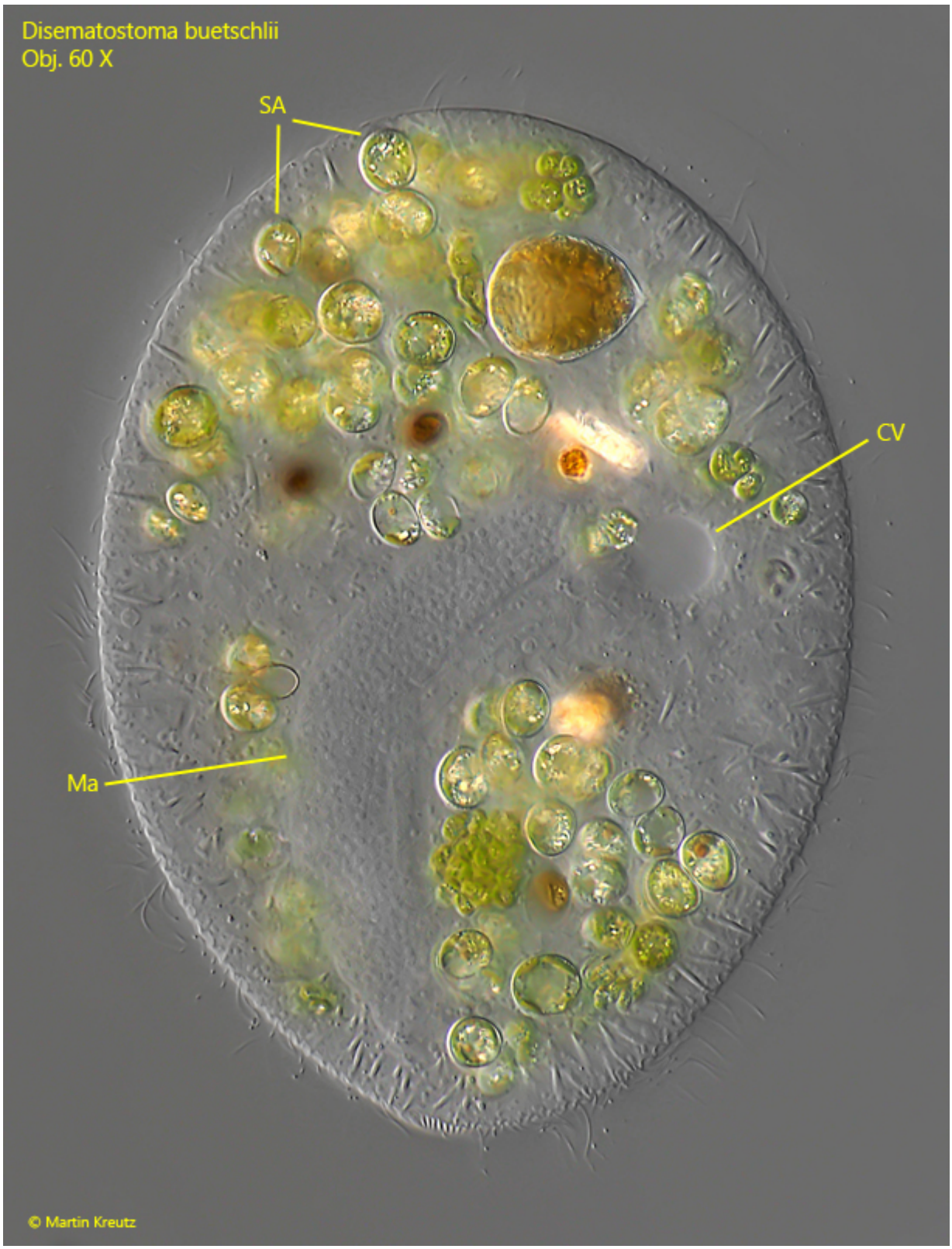


Fig. 7: *Disematostoma buetschlii*. A slightly squashed specimen from ventral with focal plane on the C-shaped macronucleus. Note the symbiotic algae (SA) in the cytoplasm. CV = contractile vacuole. Obj. 60 X.

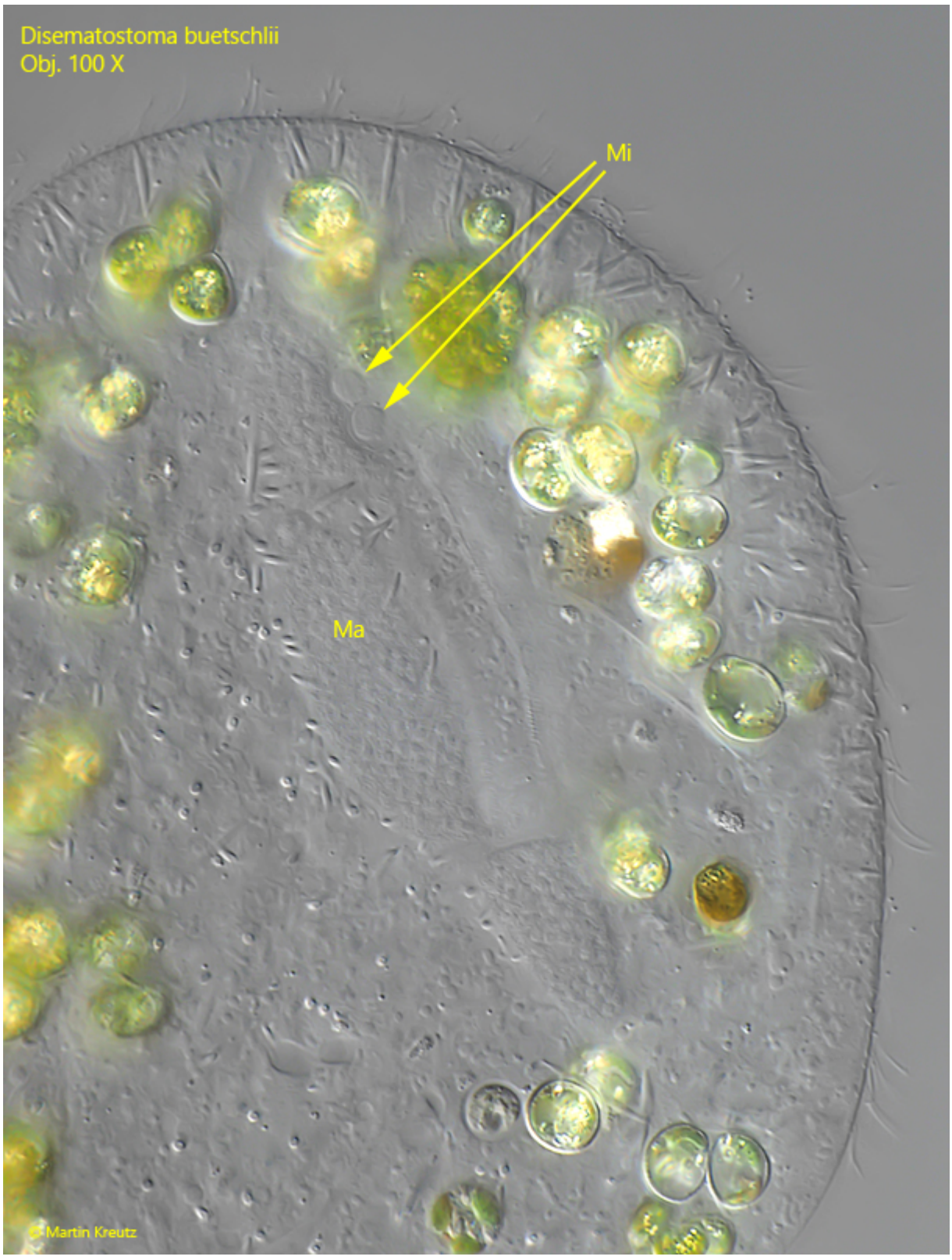


Fig. 8: *Disematostoma buetschlii*. A squashed specimen with two micronuclei (Mi). Ma = macronucleus. Obj. 100 X.

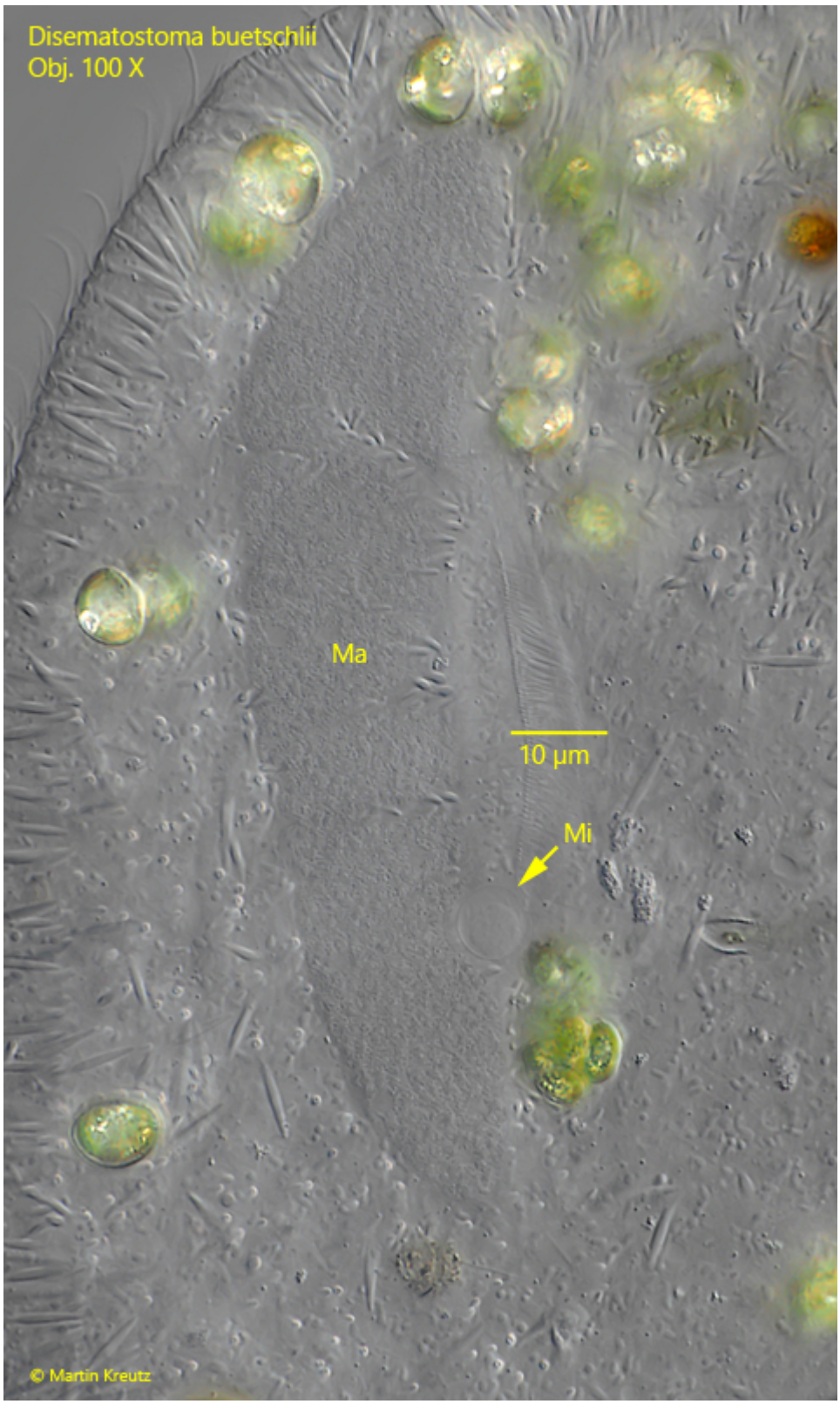


Fig. 9: *Disematostoma buetschlii*. A second squashed specimen with one micronucleus (Mi). Ma = macronucleus. Obj. 100 X.

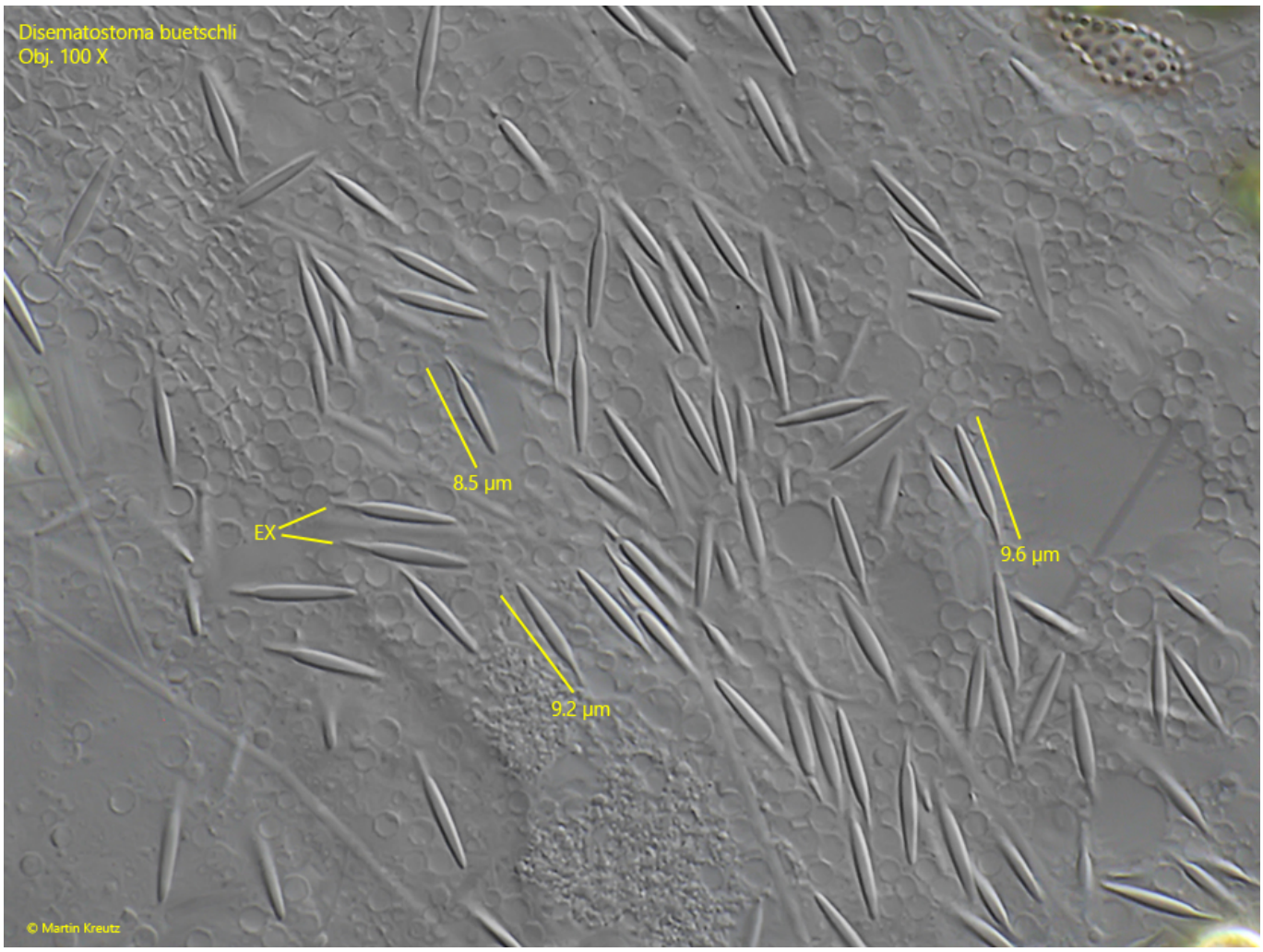


Fig. 9: *Disematostoma buetschlii*. The extrusomes (EX) are spindle-shaped, with a tapered, pointed end. They are 8-10 µm long. Obj. 100 X.

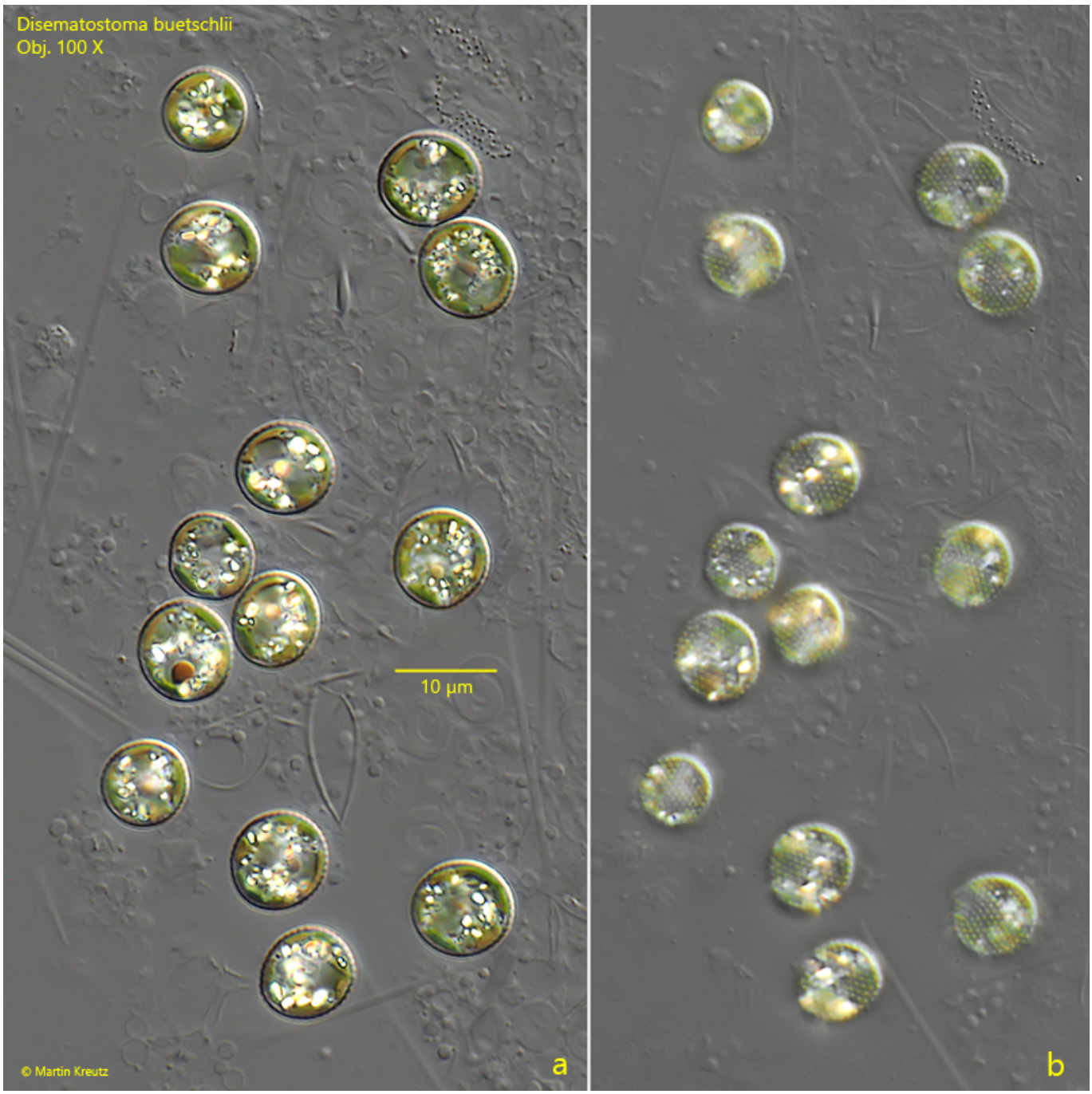


Fig. 10 a-b: *Disematostoma buetschlii*. The symbiotic algae are members of the xanthophytes with a distinct, orange oil droplet. The cell surface is covered with fine pores. The diameter of the cells is 8–9 µm. Obj. 100 X.