Holophrya 1

Most likely ID: *Holophrya* nov. spec.

Synonym: n.a.

Sampling location: Simmelried

Phylogenetic tree: n.a.

Diagnosis:

- body ellipsoid, posteriorly tapered
- length about 150 µm
- mouth opening subapical
- oral basket obliquely arranged
- cytoplasm green due to symbiotic algae
- symbiotic bacteria present, 5-6 µm long, scattered in cytoplasm
- adoral brush with 3 rows
- 50-60 longitudinal rows of cilia
- macronucleus ellipsoid or bean-shaped, one adjacent micronucleus
- extrusomes 8 µm long rods, slightly curved
- contractile vacuole terminal
- several caudal cilia

No drawings from previous authors available.

I found *Holophrya* 1 for the first time in July 2014 in the Simmelried. The specimens were in the uppermost mud layer. After that I found the species sporadically, but never frequently. I have not yet been able to find *Holophrya* 1 in my other sampling sites.

At low magnifications, *Holophrya* 1 can easily be confused with *Holophrya ovum*. However, there are some significant differences. At around 150 µm, *Holophrya* 1 is larger than *Holophrya ovum*, somewhat slimmer in shape and above all has a tapered, sometimes pointed posterior end (s. fig. 1 a-c). In addition, the mouth opening of *Holophrya* 1 is

subapical and the basket is arranged at an angle to the central longitudinal axis. In addition to the numerous symbiotic algae, the cytoplasm also contains many symbiotic bacteria (s. figs. 5, 6 and 7). The bacteria are elongated ellipsoid, oval or ovoid in shape and have a length of about 5–6 µm (s. fig. 6). The cytoplasm of these bacteria always contains granules. That the symbiotic algae and bacteria are not phagocytized food can be seen from the fact that all specimens of *Holophrya* 1 have this combination of algae and bacteria, that the algae and bacteria are always of the same species and that these symbionts are not found in food vacuoles. As far as I know, only the two ciliates *Pseudoblepharisma tenue* and *Pseudoblepharisma tenue* var. *chlorelligera* have this combination of symbionts. Both species are also present in the Simmelried.

I was able to determine the number of somatic kineties to be 50-60 (s. fig. 4). In the cytoplasm of *Holophrya* 1 there are many curved extrusomes with a length of 8 µm (s. fig. 9). They differ clearly from the extrusomes of *Holophrya ovum*, which are thinner and almost straight. The macronucleus of *Holophrya* 1 has a weak indentation in which the very large, spherical micronucleus is located (s. fig. 7). This makes the macronucleus bean-shaped. The adoral brush of *Holophrya* 1 is three-rowed, well developed and runs somewhat obliquely from top left to bottom right (s. fig. 4). It is about 30–35 µm long.

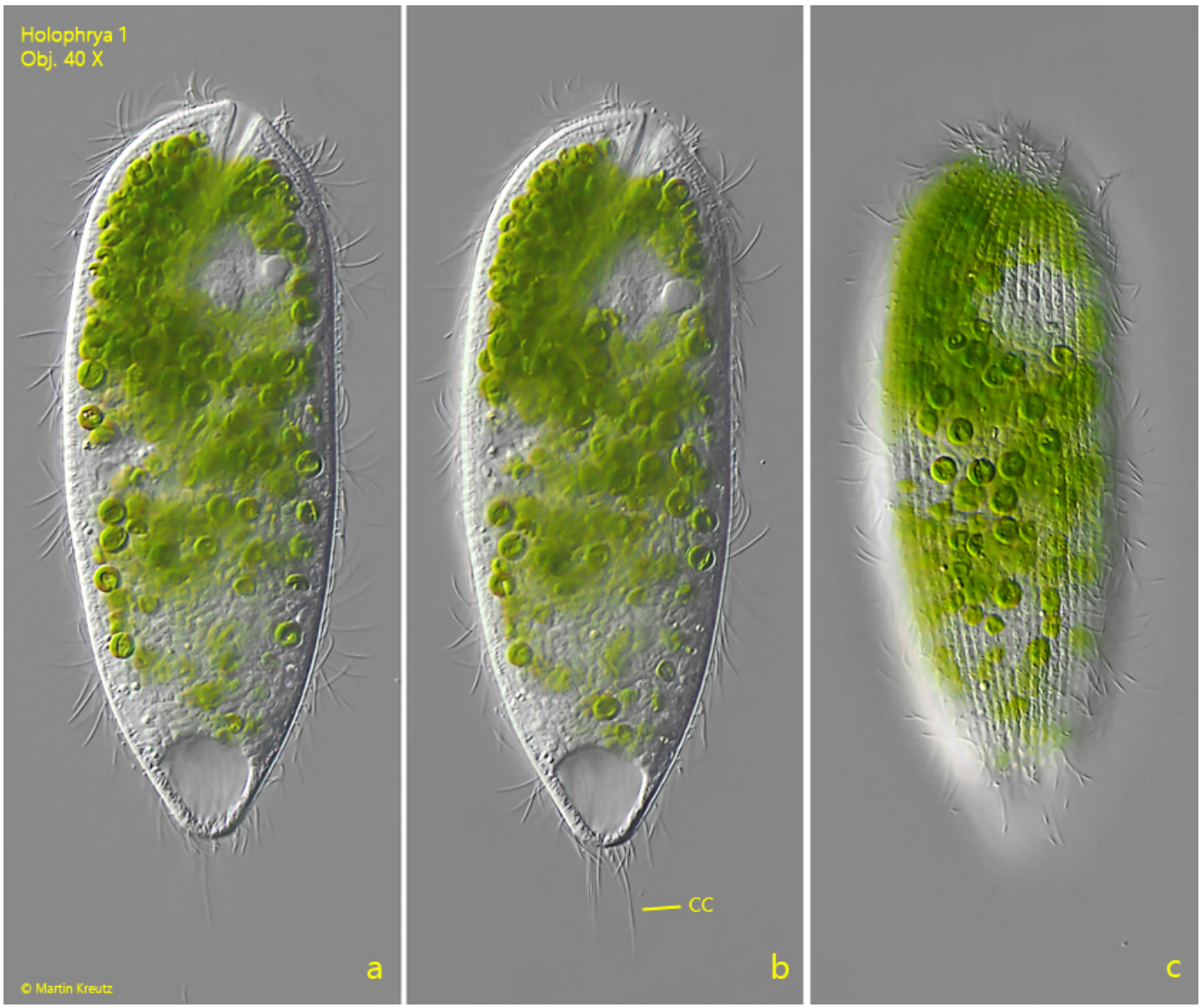

Fig. 1 a-c: *Holophrya* 1. L = 155 µm. A freely swimming specimen. Note the caudal cilia (CC). Obj. 40 X.

Fig. 2: *Holophrya* 1. A slightly squashed specimen. Note the circum oral cilia (COC) covering the mouth opening. OB = oral basket. Obj. 100 X.

Fig. 3: *Holophrya* 1. The mid-body region of a slightly squashed specimen. Ma = macronucleus. Mi = micronucleus, SA = symbiotic algae. Obj. 100 X.


Holophrya 1
Obj. 100 X
AB
10
20
24
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Fig. 4: *Holophrya* 1. Focal plane on the aoral brush and the longitutinal kineties. On this side 24 kineties are visible. Obj. 100 X.

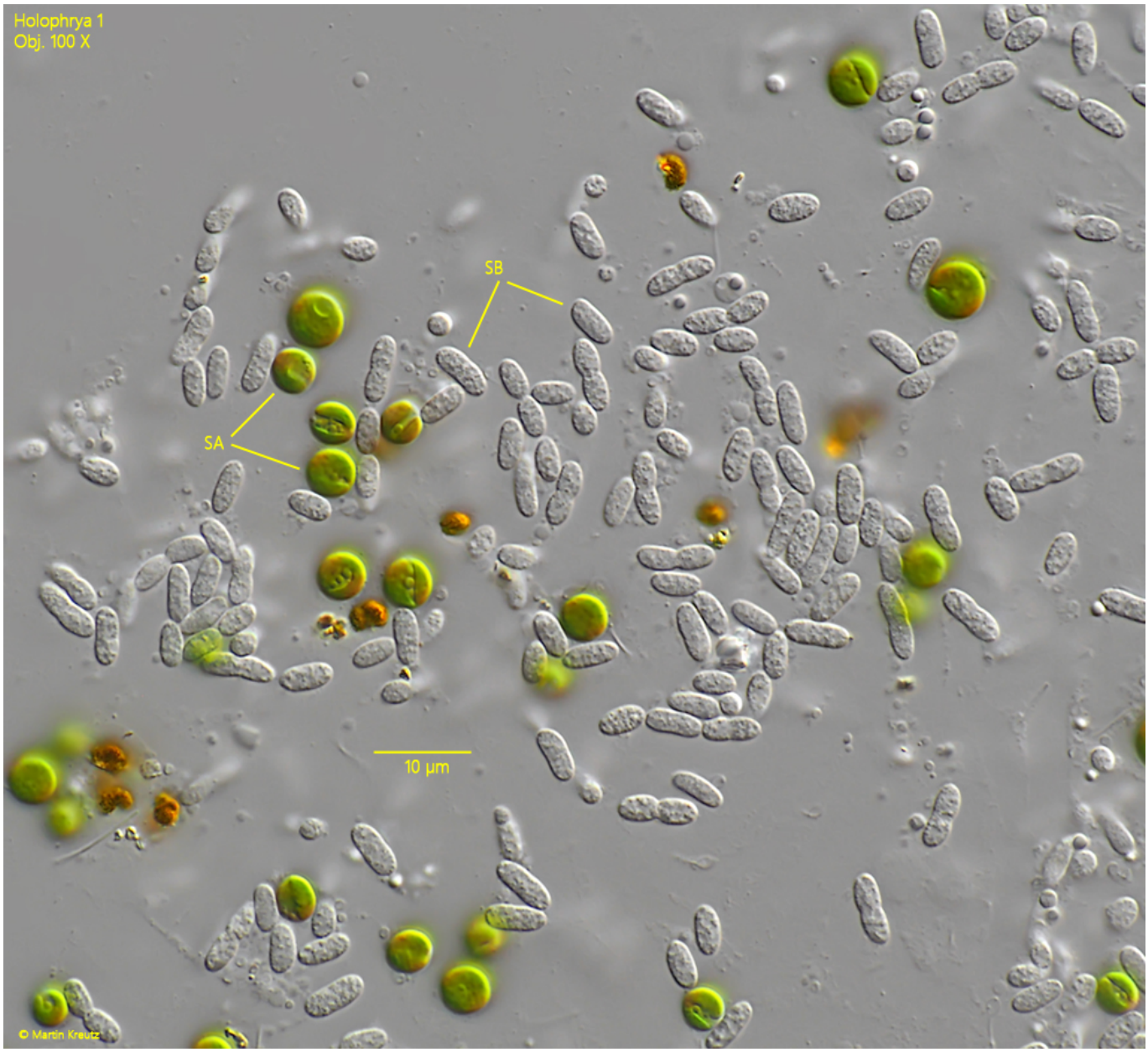

Fig. 5: *Holophrya* 1. The symbiotic bacteria (SB) and symbiotic algae (SA) in a strongly squashed specimen. Obj. 100 X.

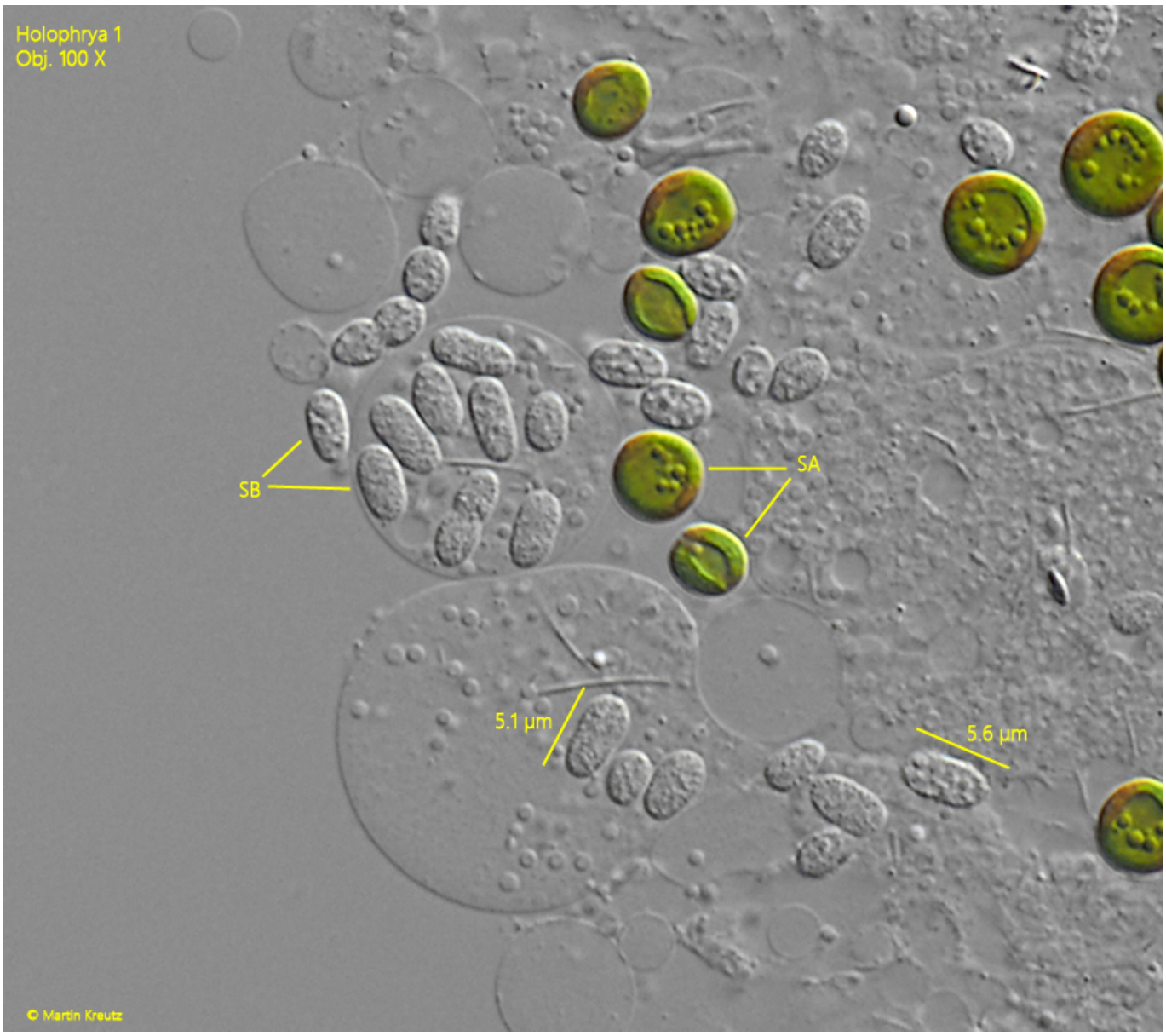

Fig. 6: *Holophrya* 1. The symbiotic bacteria in detail. In the cytoplasm of the bacteria fine granules are visible. SA = symbiotic algae. Obj. 100 X.

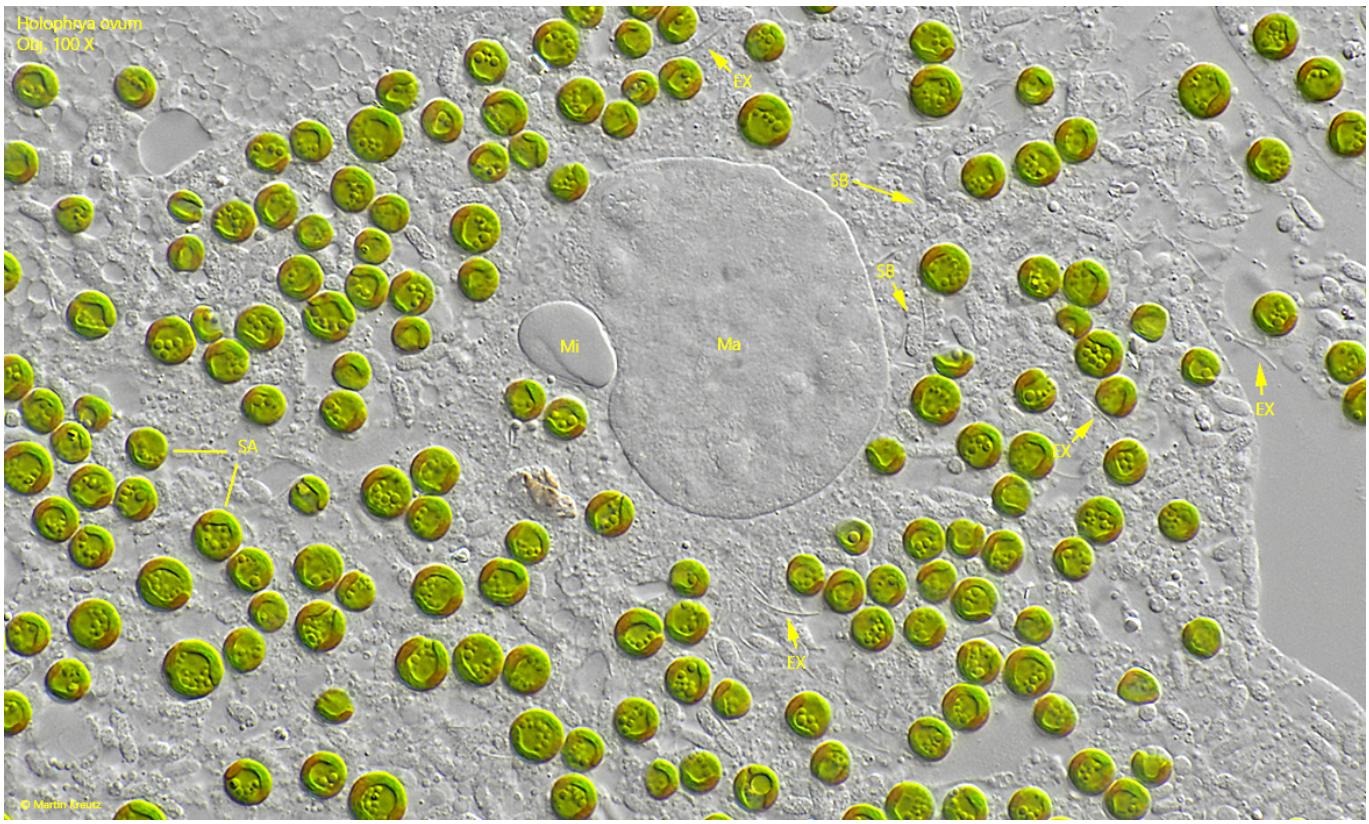

Fig. 7: *Holophrya* 1. The macronucleus (Ma) and adjacent micronucleus (Mi) in a squashed specimen. EX = extrusomes, SA = symbiotic algae, SB = symbiotic bacteria. Obj. 100 X.

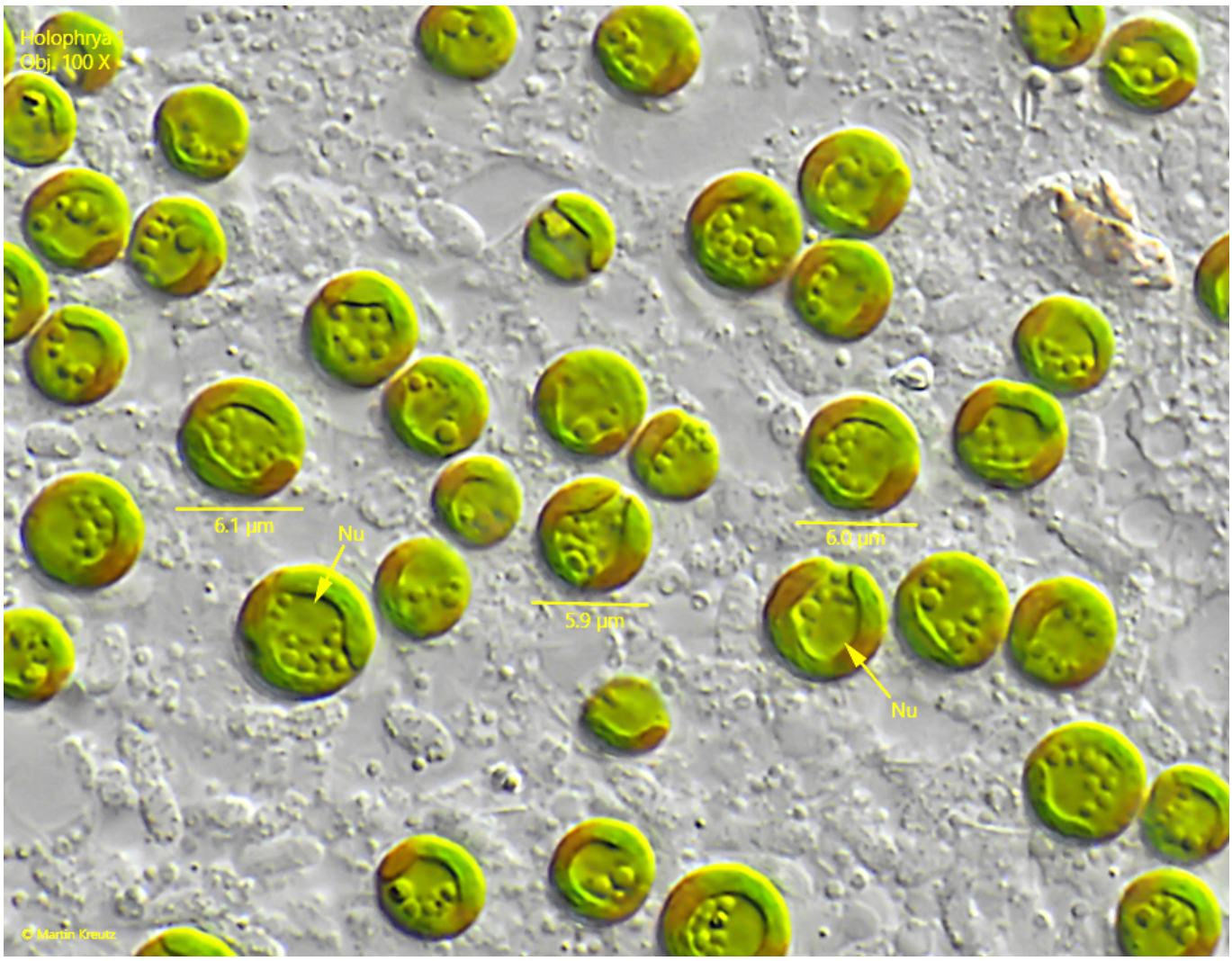

Fig. 8: *Holophrya* 1. The symbiotic algae have a diameter of about 6 µm. The cells have a cup-shaped chloroplast and an own nucleus (Nu). Each cell contains several spherical granules similar to oily vesicles. Obj. 100 X.

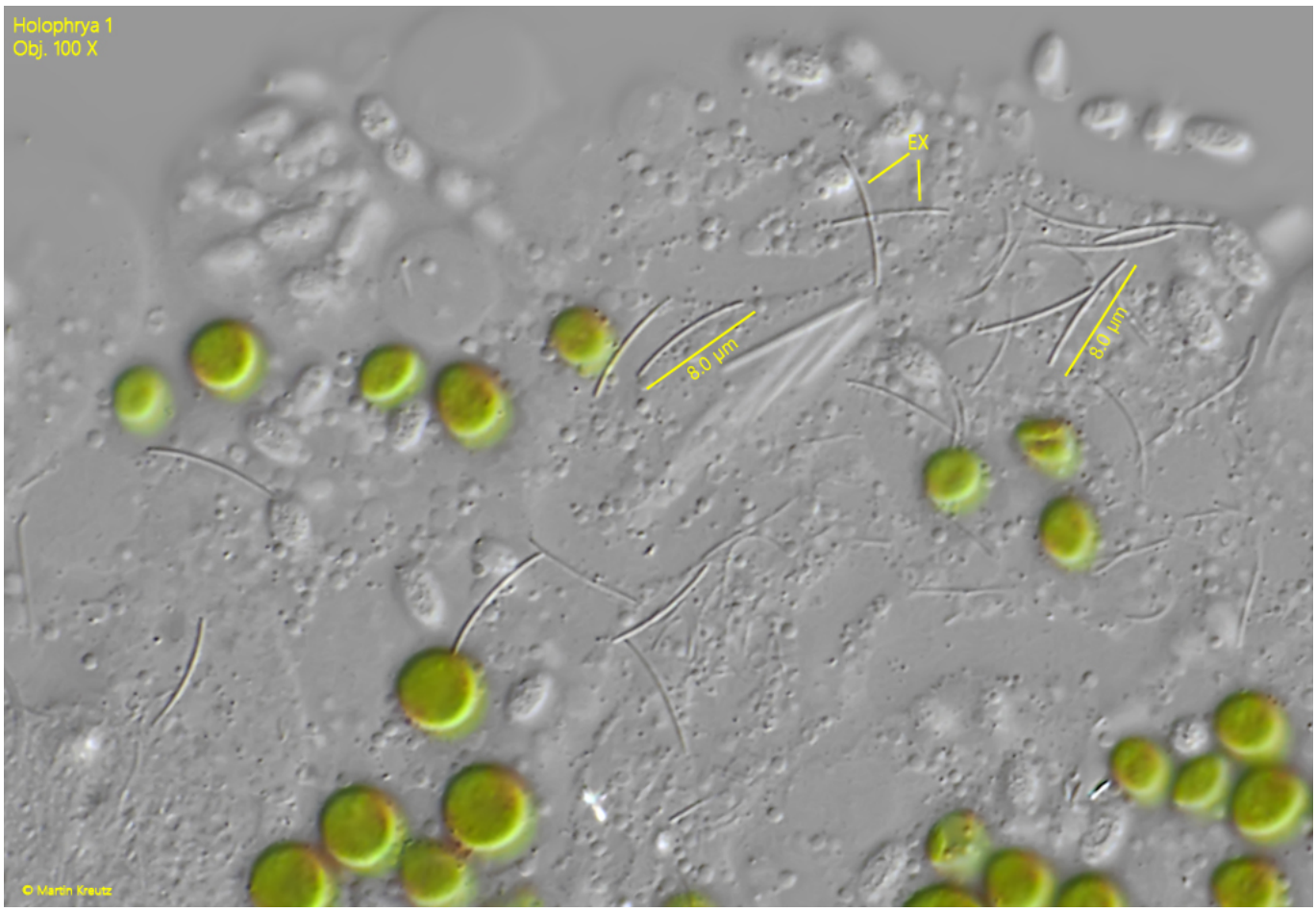

Fig. 9: *Holophrya* 1. The extrusomes are curved rods with a length of 8 µm. Obj. 100 X.