Phialina pupula

(Müller, 1773) Foissner, 1983

Most likely ID: n.a.

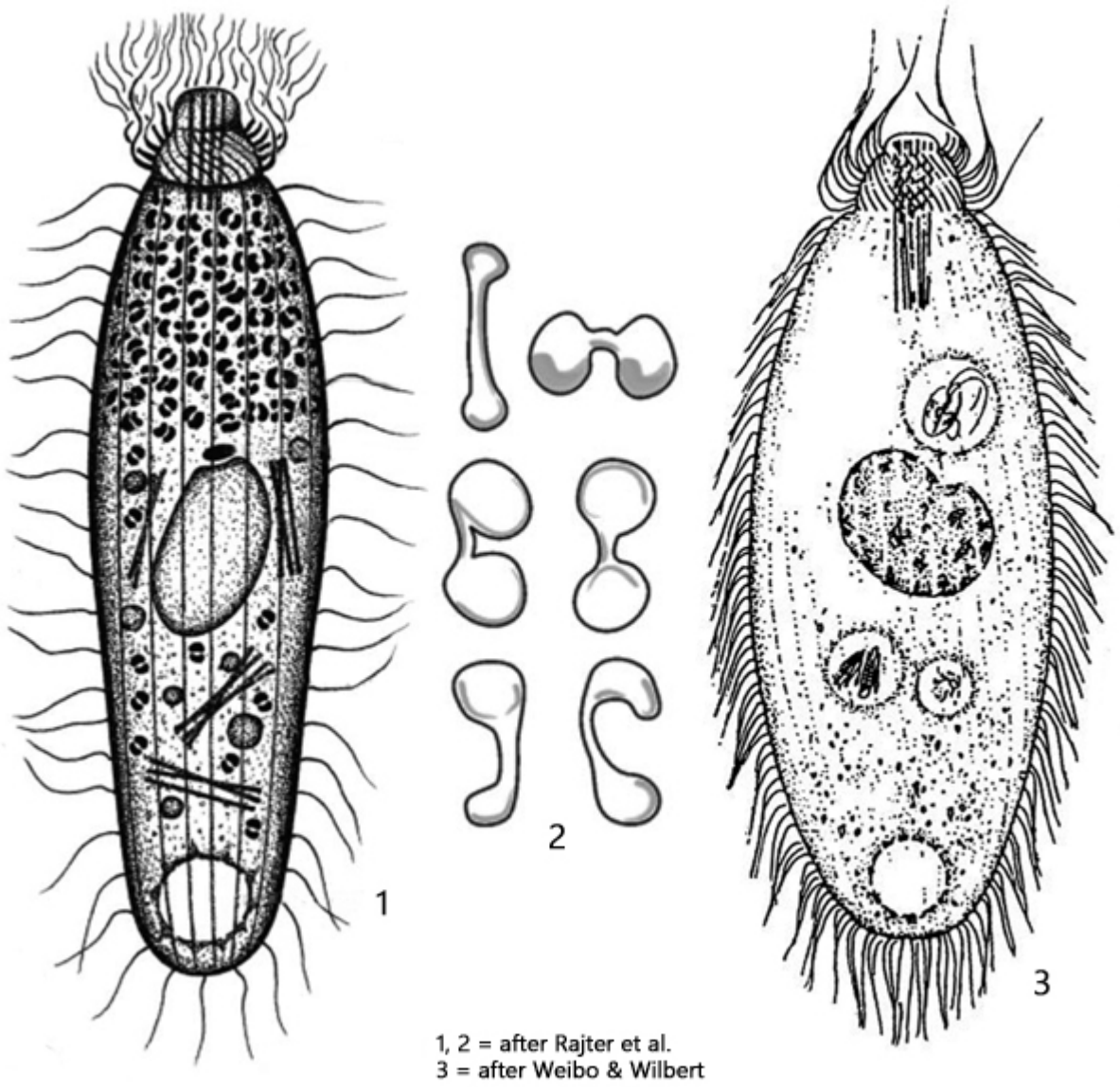
Synonyms: *Lacrymaria pupula*, *Enchelys pupula*

Sampling location: Simmelried, Pond St. Ulrich (Austria)

Phylogenetic tree: *Phialina pupula*

Diagnosis:

- body fusiform or elliptical, contractile
- length 60–130 µm, width 20–50 µm
- head barrel-shaped, without neck, about 8.5 µm long
- head kineties run counterclockwise
- cytoplasm filled with dumbbell-shaped inclusions
- macronucleus elliptical with adjacent micronucleus
- extrusomes 10 µm long
- 15 longitudinal rows of cilia
- contractile vacuole subterminal



Phialina pupula

I regularly find *Phialina pupula* in the mud of Simmelried. Another site is a small pond behind a parking lot in the village of St. Ulrich in Austria.

The genus *Phialina* was revived by Foissner (1983). This genus includes ciliates which have a clearly separated head without a neck. In addition, these species are only slightly contractile. The contractile species with a distinct neck are grouped in the genus *Lacrymaria*.

In *Phialina pupula* the head is about 8–10 µm long. In my population it was mostly 10 µm. Spirally kineties run counterclockwise on the head (s. fig. 6). A bundle of parallel extrusomes is arranged in the head, which according to my measurements are about 9 µm long (s. fig. 5).

Phialina pupula is a fast swimming ciliate, which usually appears brown or even opaque black at low magnification. Even at low coverslip pressure, the specimens contract quickly and take on a rather oval shape. As the specimens are always crammed with granules, food vacuoles and inclusions, a closer examination is only possible in squashed specimens. Only then does the ellipsoid macronucleus with an attached micronucleus become visible (s. fig. 7). The most striking feature of *Phialina pupula* are the numerous dumbbell-shaped inclusions in the cytoplasm (s. figs. 8 and 9). They are highly refractive and light up in the DIC. Nothing is known about their nature and composition. However, they are a characteristic identifying feature of *Phialina pupula*.

The similar species *Phialina macrostomata*, *Phialina vertens* and *Phialina vermicularis* are all smaller than 85 µm in the elongated state and do not have the characteristic dumbbell-shaped inclusions.

More images and information on *Phialina pupula*: Dr. Jeffrey Silverman-iNaturalist-*Phialina pupula*

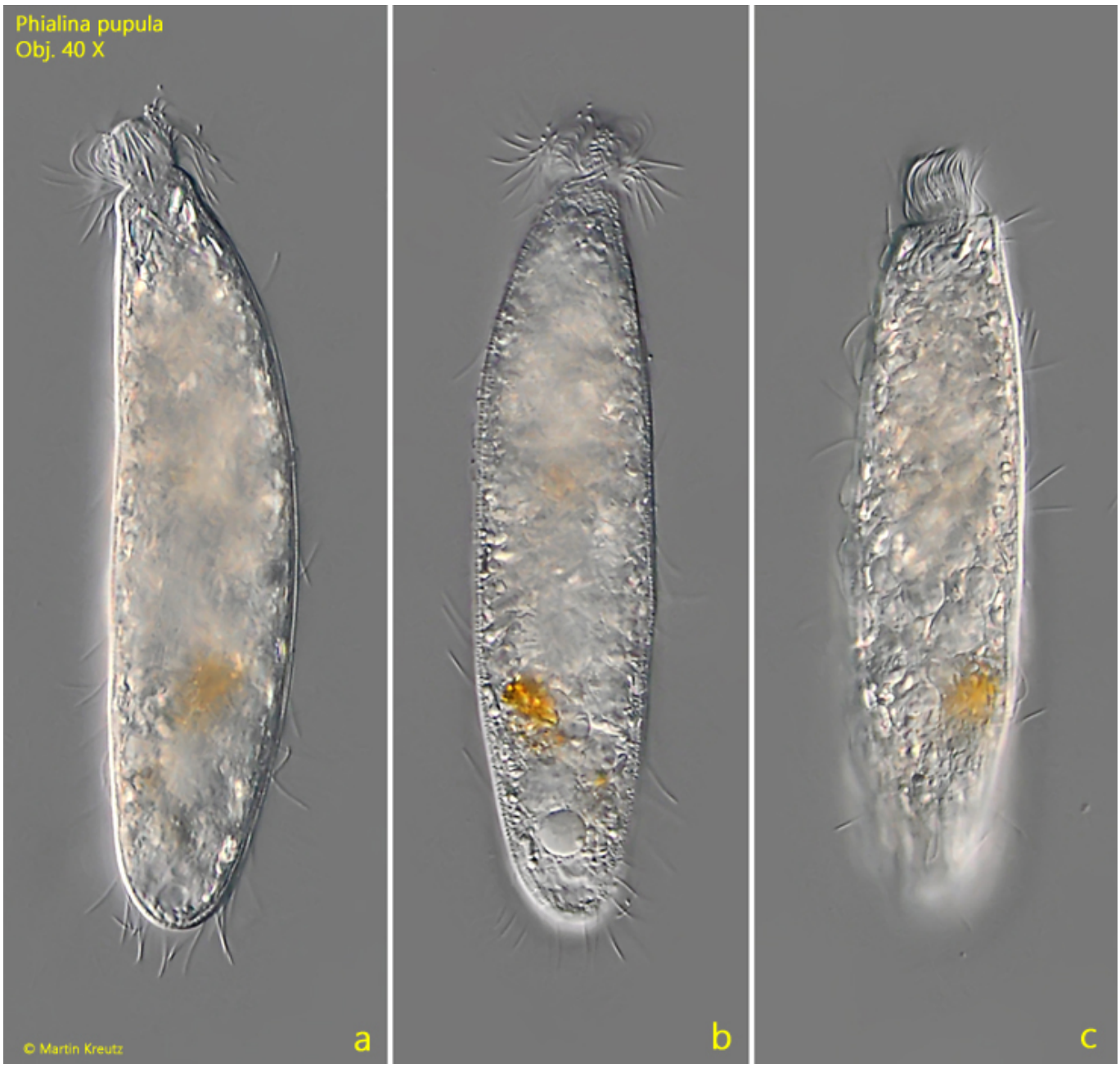


Fig. 1 a-c: *Phialina pupula*. L = 132 µm. A freely swimming specimen. Obj. 40 X.

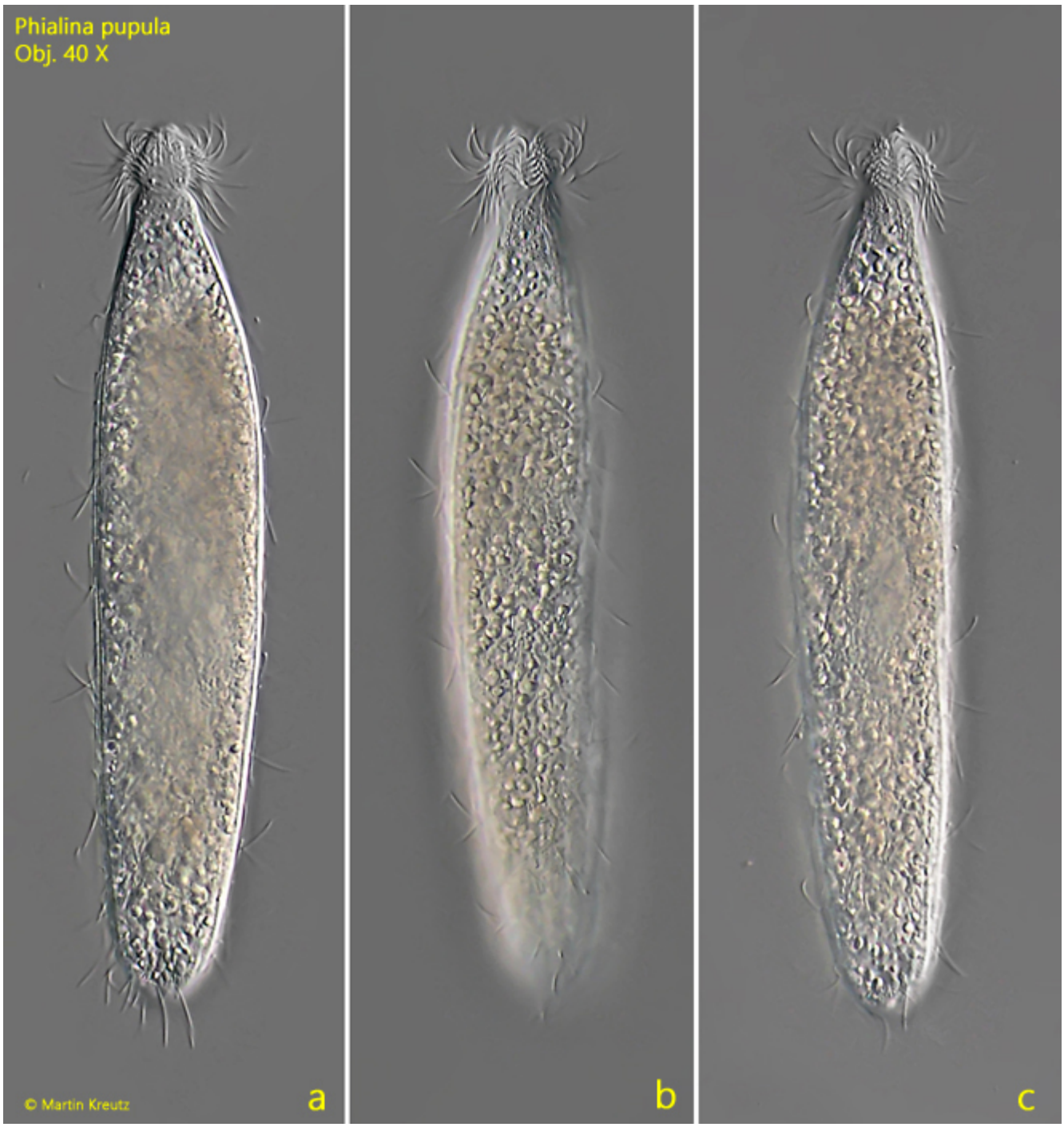


Fig. 2 a-c: *Phialina pupula*. L = 152 µm. A second, freely swimming specimen. Obj. 40 X.

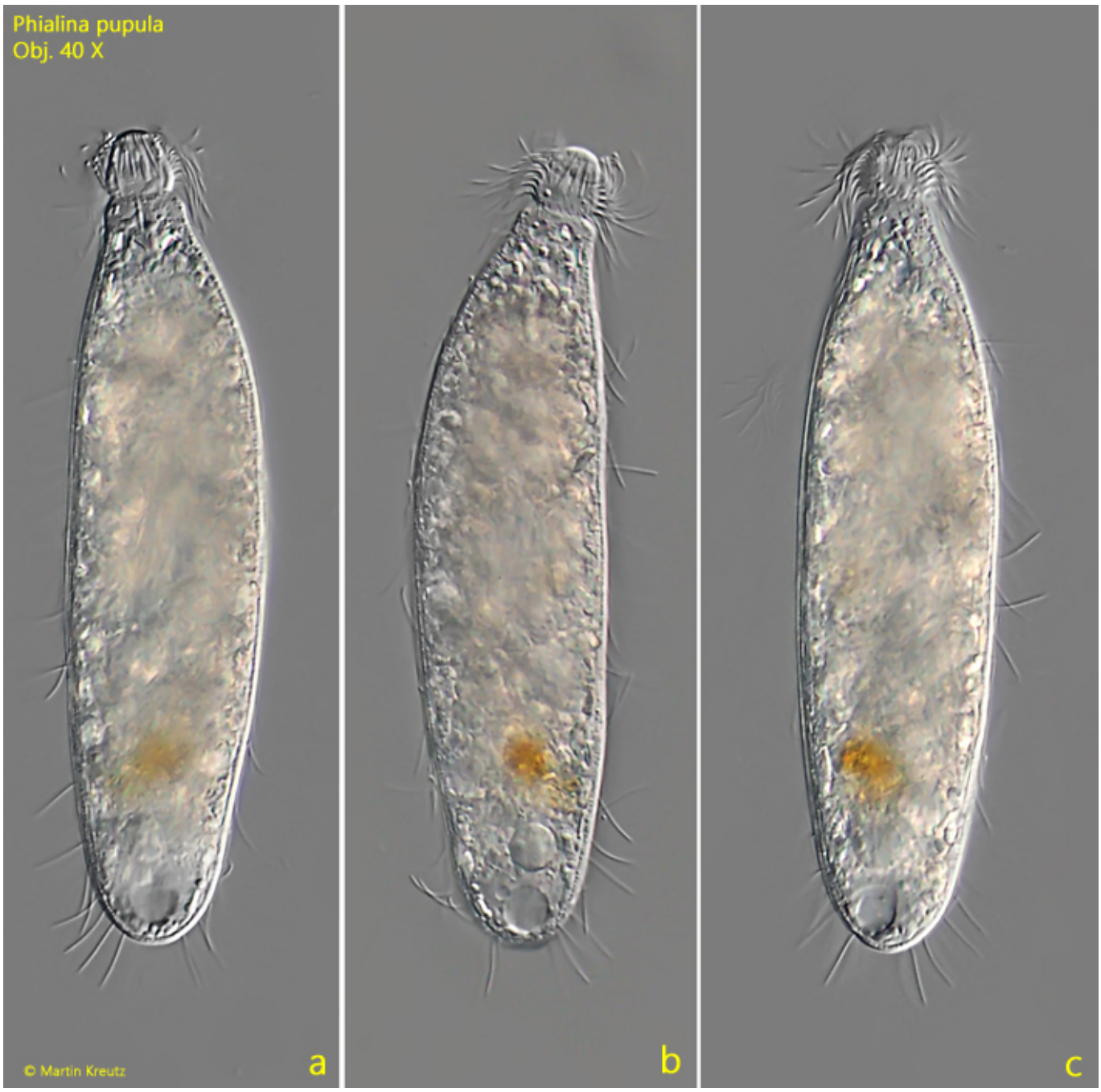


Fig. 3 a-c: *Phialina pupula*. L = 124 µm. A third, freely swimming specimen. Obj. 40 X.

Fig. 4 a-b: *Phialina pupula*. L = 120 µm. Two focal planes of a slightly squashed and contracted specimen. Obj. 100 X.

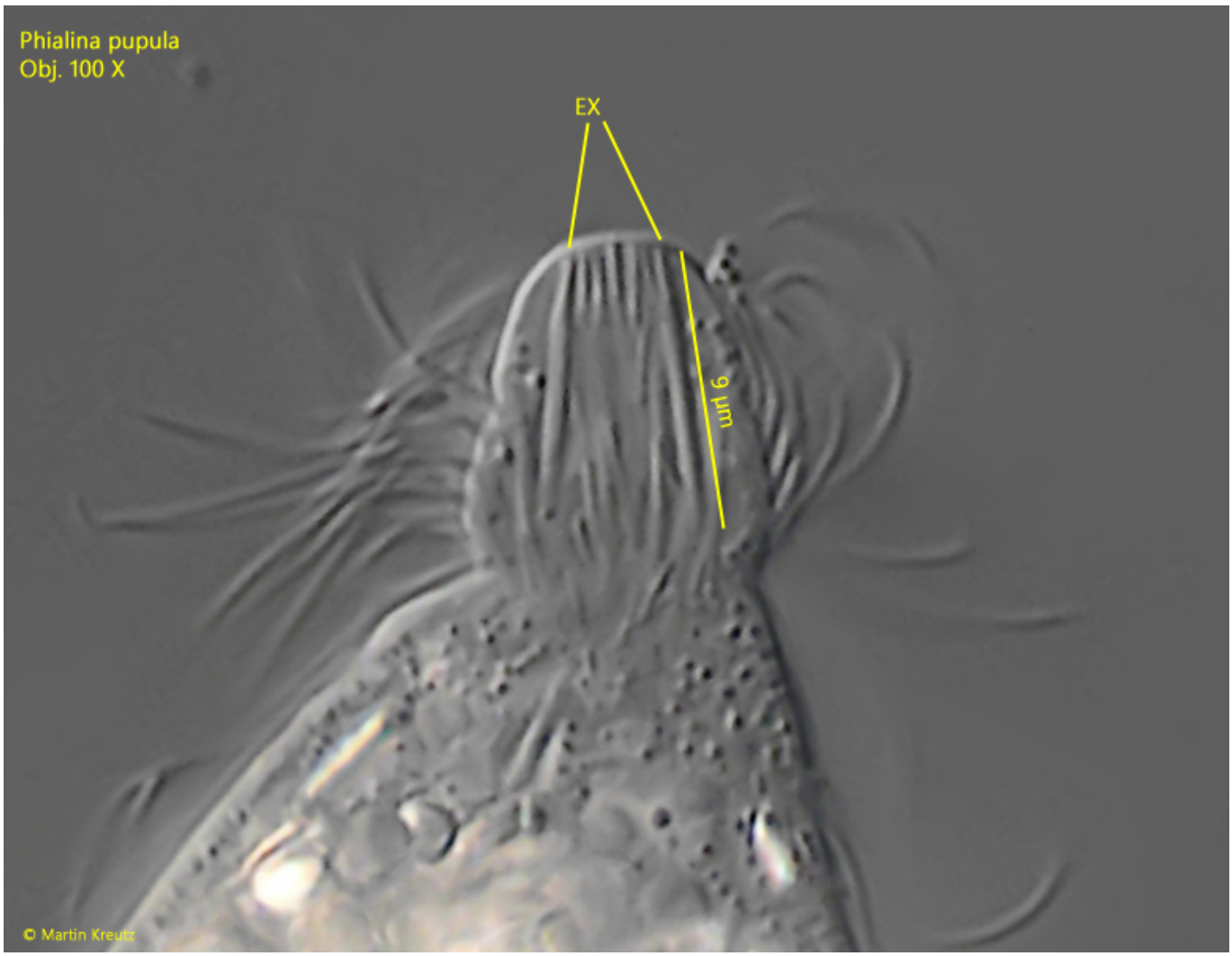


Fig. 5: *Phialina pupula*. The extrusomes (EX) arranged in the head are about 9 µm long. Obj. 100 X.

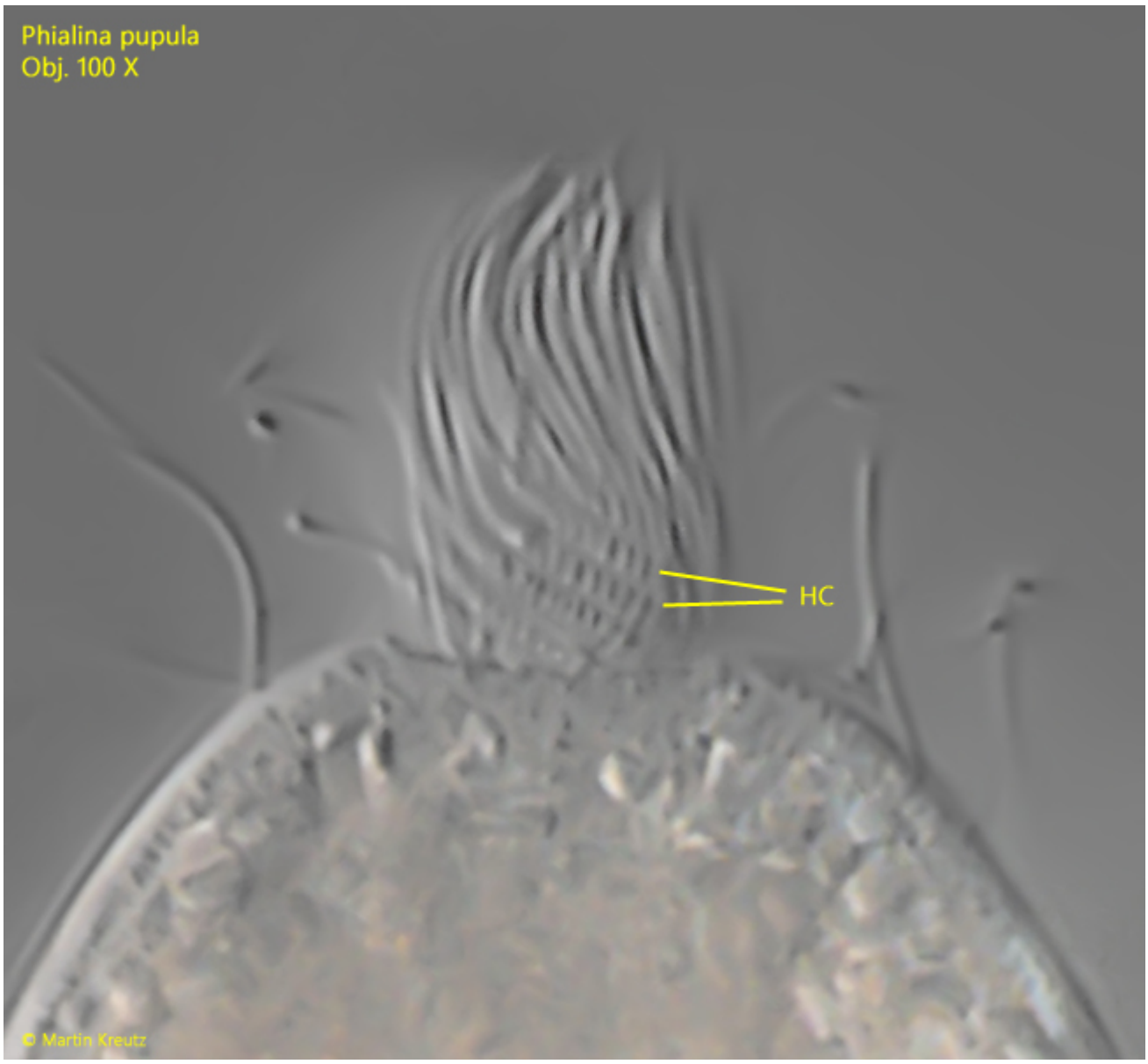


Fig. 6: *Phialina pupula*. Focal plane on the counterclockwise running head kineties (HC). Obj. 100 X.

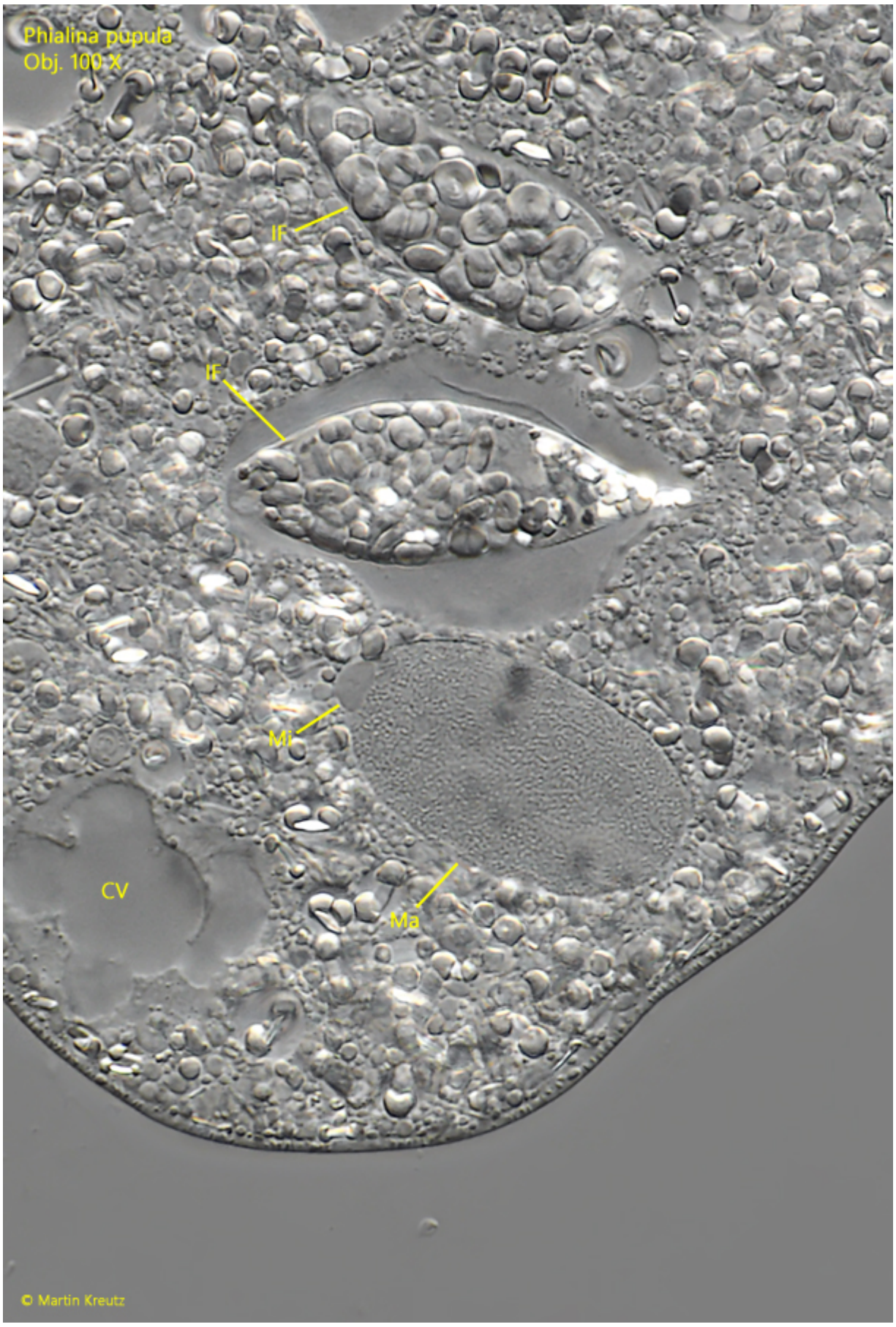


Fig. 7: *Phialina pupula*. The macronucleus (Ma) with the adjacent micronucleus (Mi) in a squashed specimen. In the food vacuoles two ingested flagellates (IF) are

visible. CV = contractile vacuole. Obj. 100 X.

Fig. 8: *Phialina pupula*. Focal planes on the dumbbell-shaped inclusions (DI) scattered in the cytoplasm of a slightly squashed specimen. Obj. 100 X.

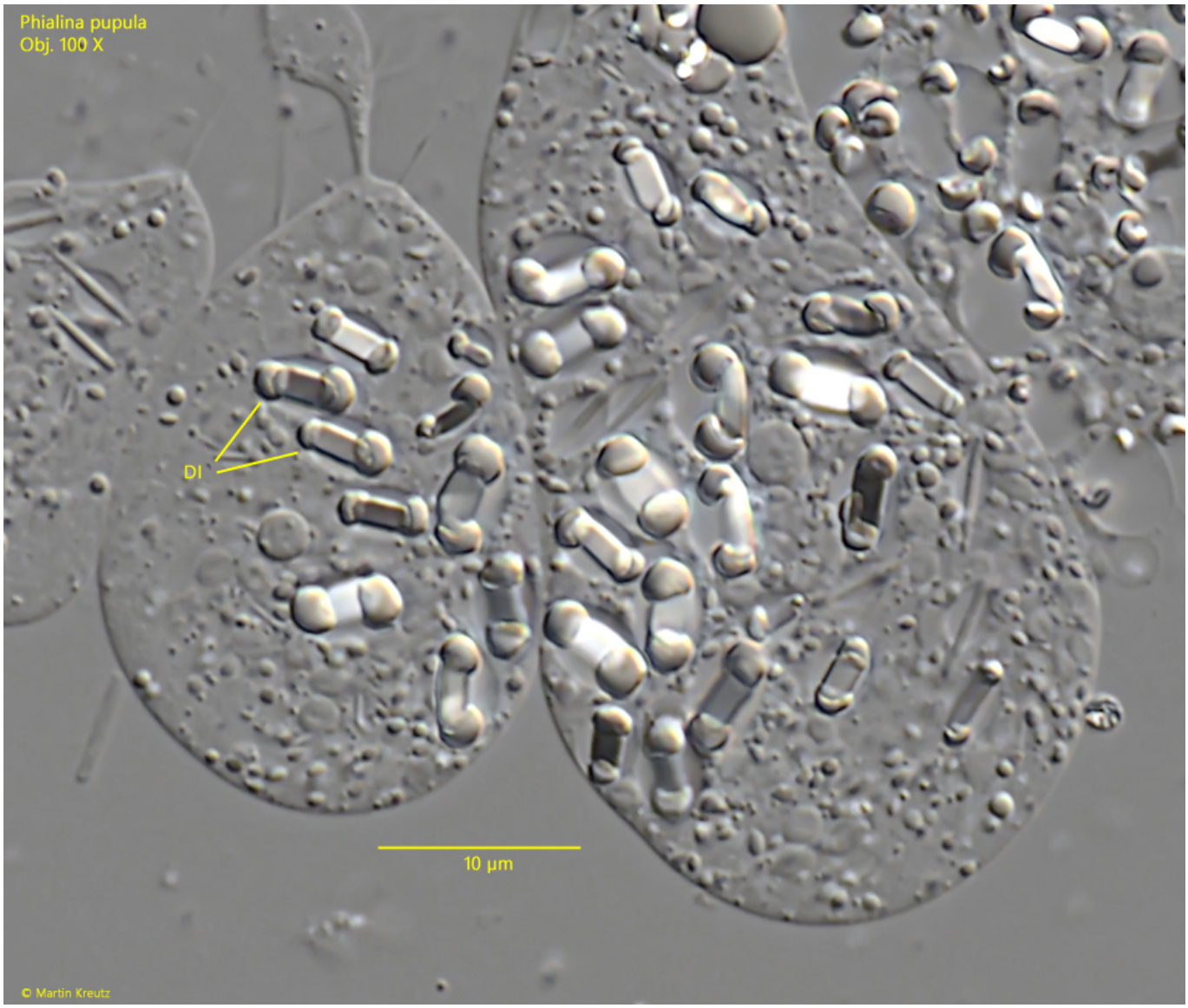


Fig. 9: *Phialina pupula*. The dumbbell-shaped inclusiones (DI) in a strongly squashed specimen. The inclusions are about 5 µm long. Obj. 100 X.