Strobilidium caudatum

(Fromentel, 1876) Foissner, 1987

Most likely ID: n.a.

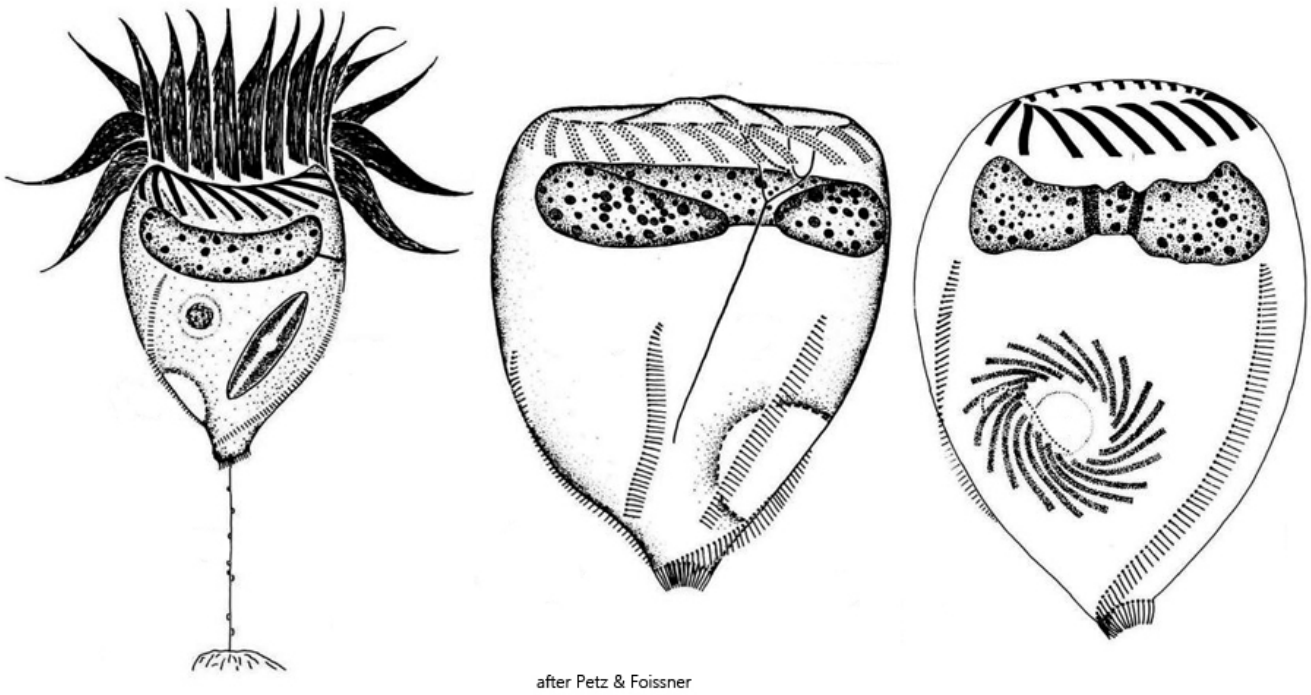
Synonyms: *Strombidion caudatum*, *Strombidium gyrans*, *Strobilidium gyrans*

Sampling location: Simmelried, Ulmisried, Mühlhalden pond, Mainau pond, Purren pond, Mühlweiher Litzelstetten

Phylogenetic tree: *Strobilidium caudatum*

Diagnosis:

- body calyx-shaped or inverted pear-shaped
- length 35–70 µm, width 30–45 µm
- apical large adoral zone of membranelles
- one horseshoe-shaped macronucleus below adoral zone
- one micronucleus adjacent to macronucleus
- contractile vacuole in posterior third
- formation of oral promordium is created near mid-body
- 5-7 spiral somatic kineties in posterior half
- 3 somatic kineties end as left-handed spiral posterior
- posterior pole (scopula) is able to create mucous thread (hard to see)
- very rapid movement



Strobilidium caudatum

Strobilidium caudatum was first described by Fromentel in 1876 as *Strombidion caudatum*. Thirteen years later, Stokes described a very similar ciliate as *Strombidium gyrans*. It was very likely the same species, which was then transferred in 1892 by Schewiakow to the new genus *Strobilidium* as *Strobilidium gyrans*. Kahl then adopted this name in 1932, which is why many descriptions of this species appeared under the name *Strobilidium gyrans* after him. It was not until 1987 that Foissner determined that the original and older designation of the species as “caudatum” takes precedence and that it must therefore correctly be called *Strobilidium caudatum*. In 1992, Petz & Foissner published a detailed redescription of *Strobilidium caudatum.*

Strobilidium caudatum is extremely common at my sampling sites. The specimens are particularly often found among decomposing plant material. *Strobilidium caudatum* is an exceptionally fast swimmer that is difficult to study and photograph when swimming freely. The ciliate can attach itself to detritus or plant remains with a thin mucous thread and, while hanging from it, makes tumbling movements as it swirls food toward itself (s. figs. 11 and 12). At any disturbance, for example by the pressure of a coverslip, the specimens immediately detach from the thread and dart away.

The mucous thread is formed by the so-called scopula at the posterior cell pole. Here, 3 of the 5–7 somatic kineties converge spirally (s. fig. 10 a-b). In *Strobilidium caudatum*, the somatic kineties take the form of flat ridges covered with short,

bristle-like cilia (s. figs. 8 and 9). All these cilia point to the left, as Kahl had already observed. The somatic kineties on the ventral side end before the posterior end, while the dorsal kineties extend to the posterior end and form the scopula.

At the anterior end there is a wreath of long adoral membranelles, which swirl food toward the cell but also provide its tremendously rapid propulsion (s. fig. 5). The mouth opening is hidden slightly off-center among the adoral membranelles and is very difficult to find.

Below the adoral zone lies the transversely oriented, horseshoe-shaped macronucleus (s. fig. 13). A micronucleus is said to be present, but I was unable to identify it. About midway along the body, on the dorsal side, a spiral structure can be found in many specimens (s. figs. 1 c and 6). This is the primordium of a further oral apparatus, formed in preparation for an upcoming division. Shortly before cell division, the membranelles of the oral primordium elongate, resulting in a tuft-like structure (s. fig. 7).

The free-swimming specimens in my population were up to 82 µm long and thus about 15 % longer than reported by Foissner, Blatterer, Berger & Kohmann (1991). I attribute this to the difficulty of measuring the length of freely swimming, extended specimens, since earlier authors did not have the option of photographing them with a microflash.

The somatic kineties of the similar species *Rimostrombidium lacustris* do not reach the posterior end, which means this species also lacks a scopula. All other species within the genus *Strobilidium* cannot form a mucous thread. This is a distinguishing feature of *Strobilidium caudatum*.

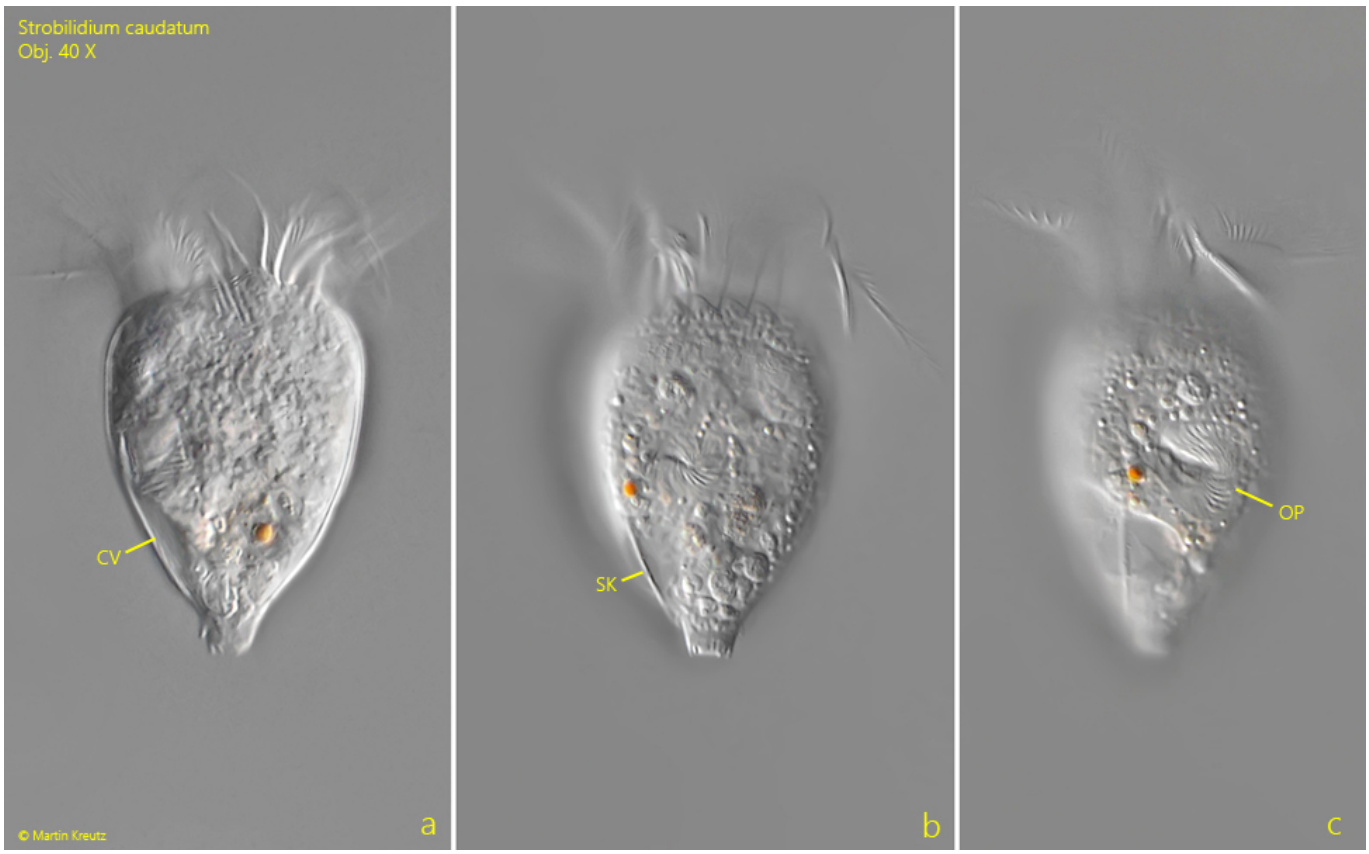


Fig. 1 a-c: *Strobilidium caudatum*. L = 76 µm. A freely swimming specimen. Near mid-body on the dorsal side the oral primordium (OP) is visible. This is the formation of a second oral apparatus before cell division. The somatic kineties (SK) have the shape of flat ribs. CV = contractile vacuole. Obj. 40 X.

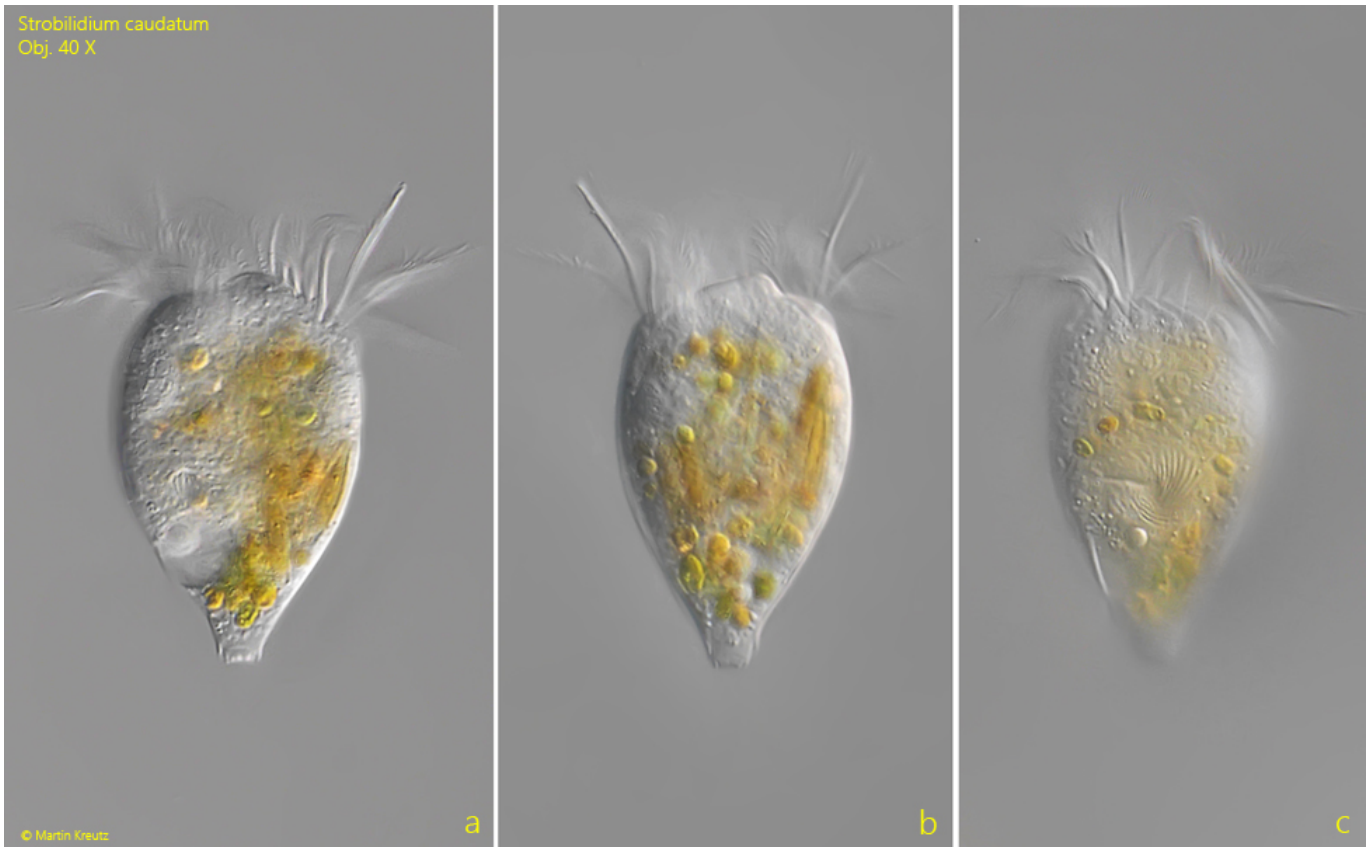


Fig. 2 a-c: *Strobilidium caudatum*. L = 86 µm. A second freely swimming specimen with ingested diatoms and algae. Obj. 40 X.

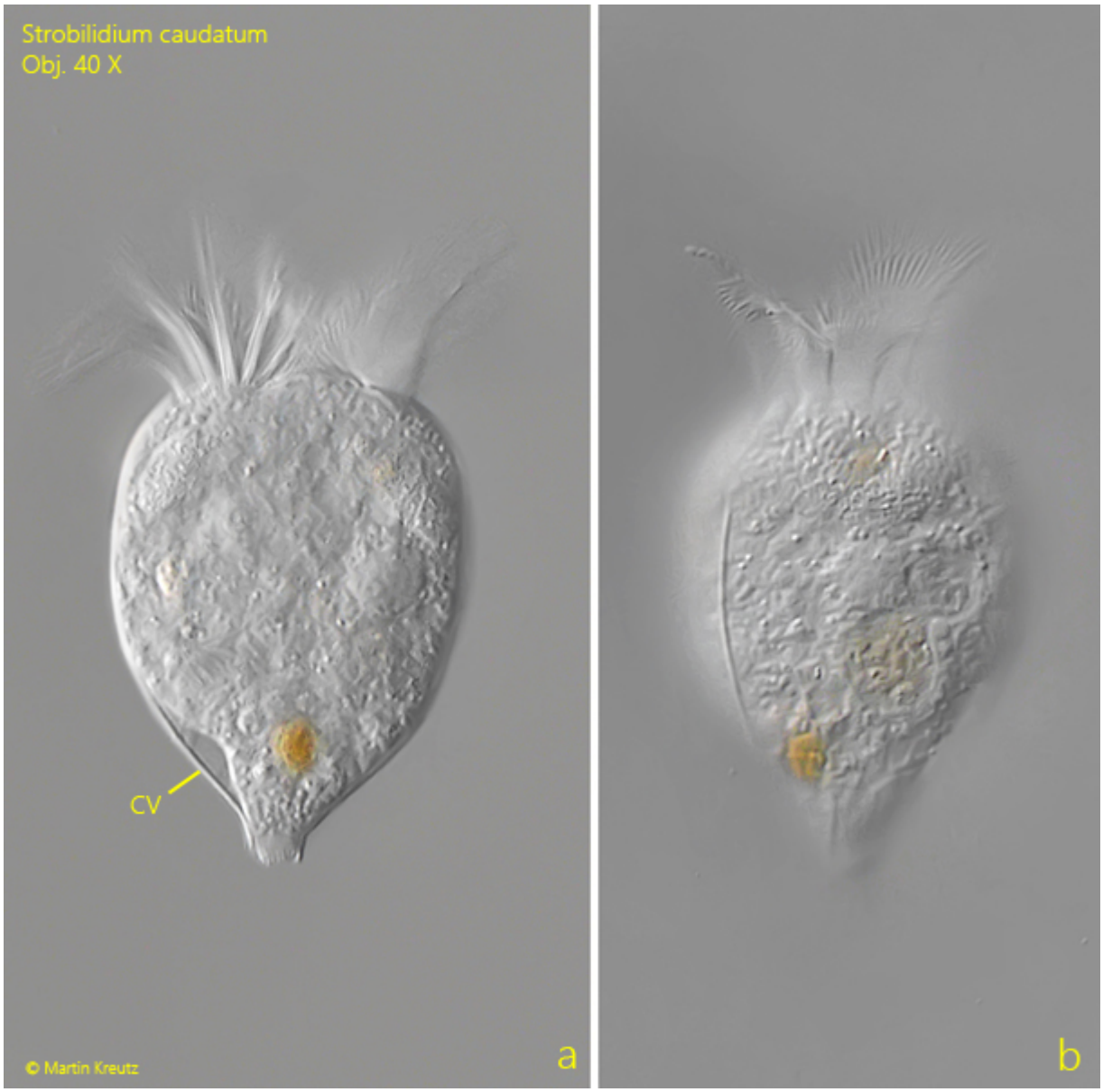


Fig. 3 a-b: *Strobilidium caudatum*. L = 82 µm. A third freely swimming specimen. CV = contractile vacuole. Obj. 40 X.

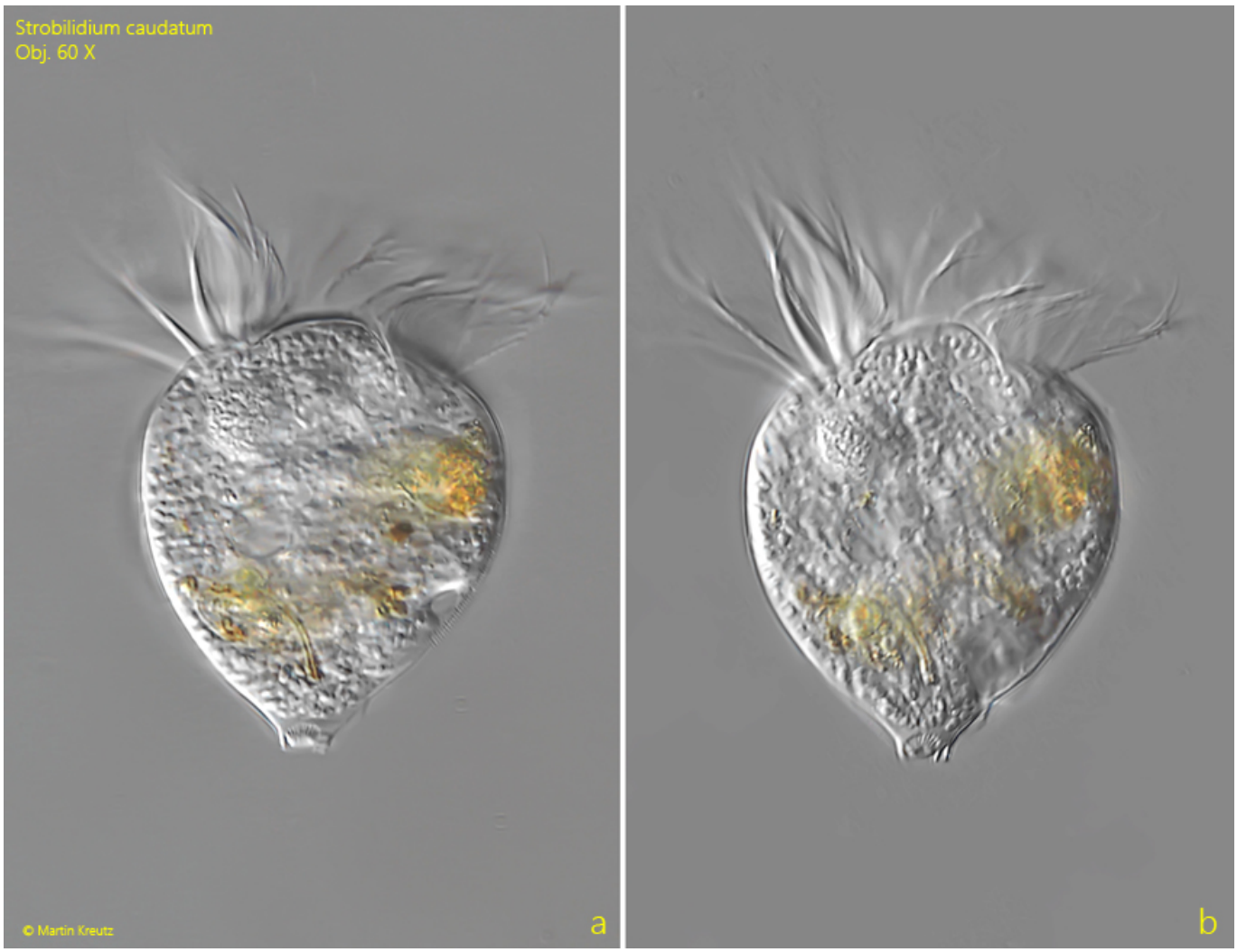


Fig. 4 a-b: *Strobilidium caudatum*. L = 63 µm. A slightly squashed specimen at higher magnification. Obj. 60 X.

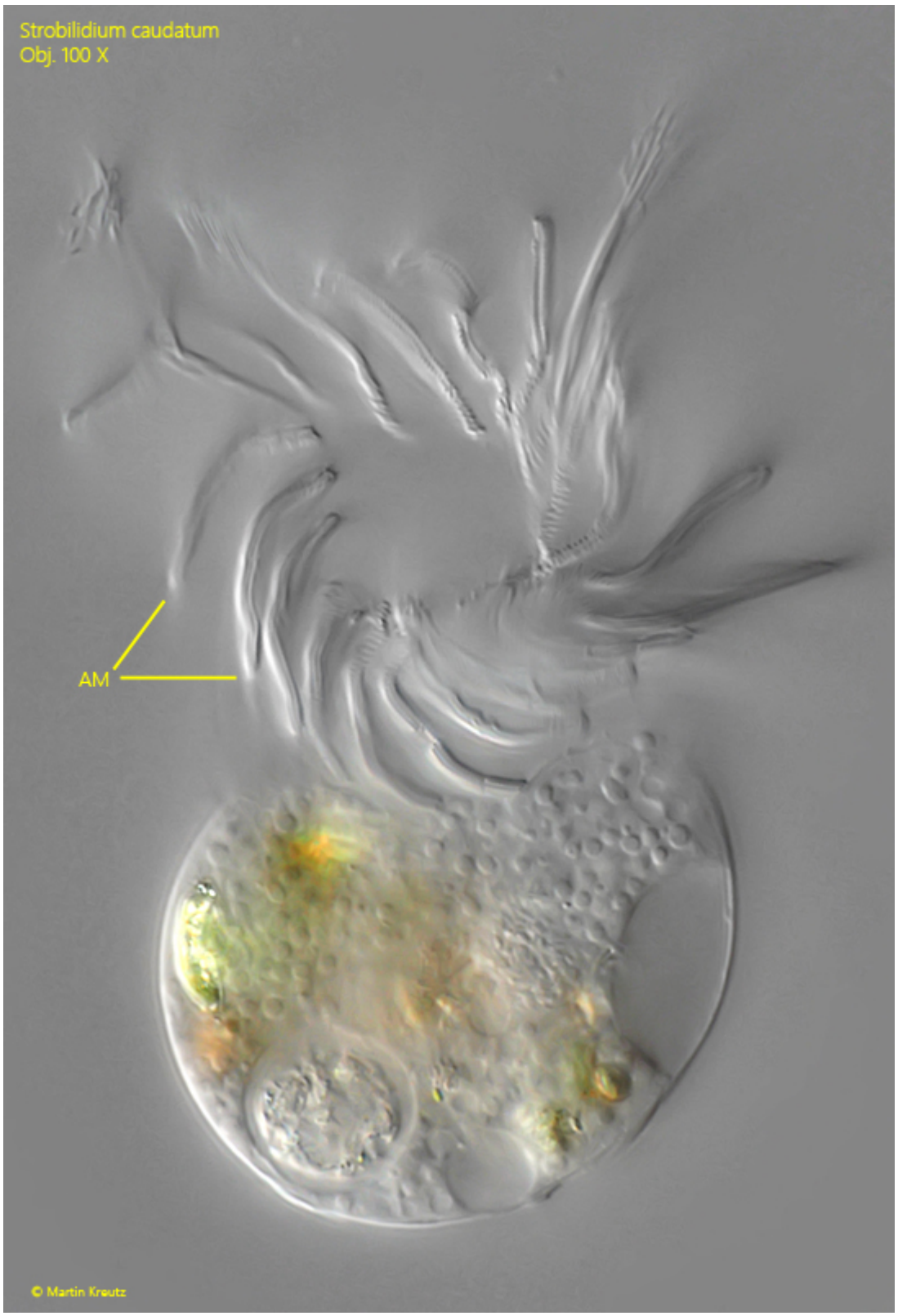


Fig. 5: *Strobilidium caudatum*. The large apical zone of adoral membranelles (AM) enable very rapid locomotion. Obj. 40 X.

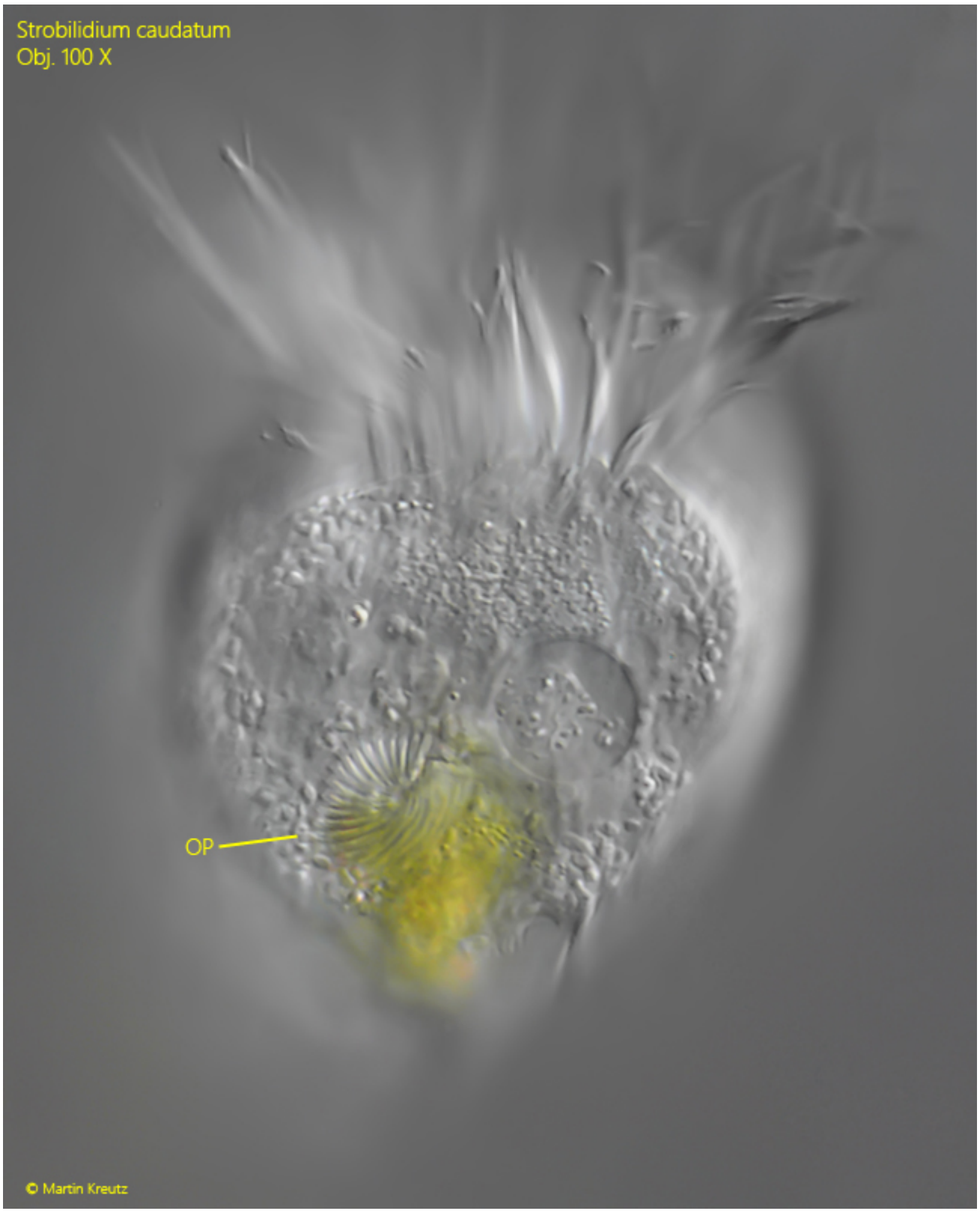


Fig. 6: *Strobilidium caudatum*. The oral primordium (OP) in a slightly squashed specimen. Obj. 100 X.



Fig. 7: *Strobilidium caudatum*. Shortly before cell division the membranelles of the oral primordium (OP) reach almost the final length. Obj. 60 X.

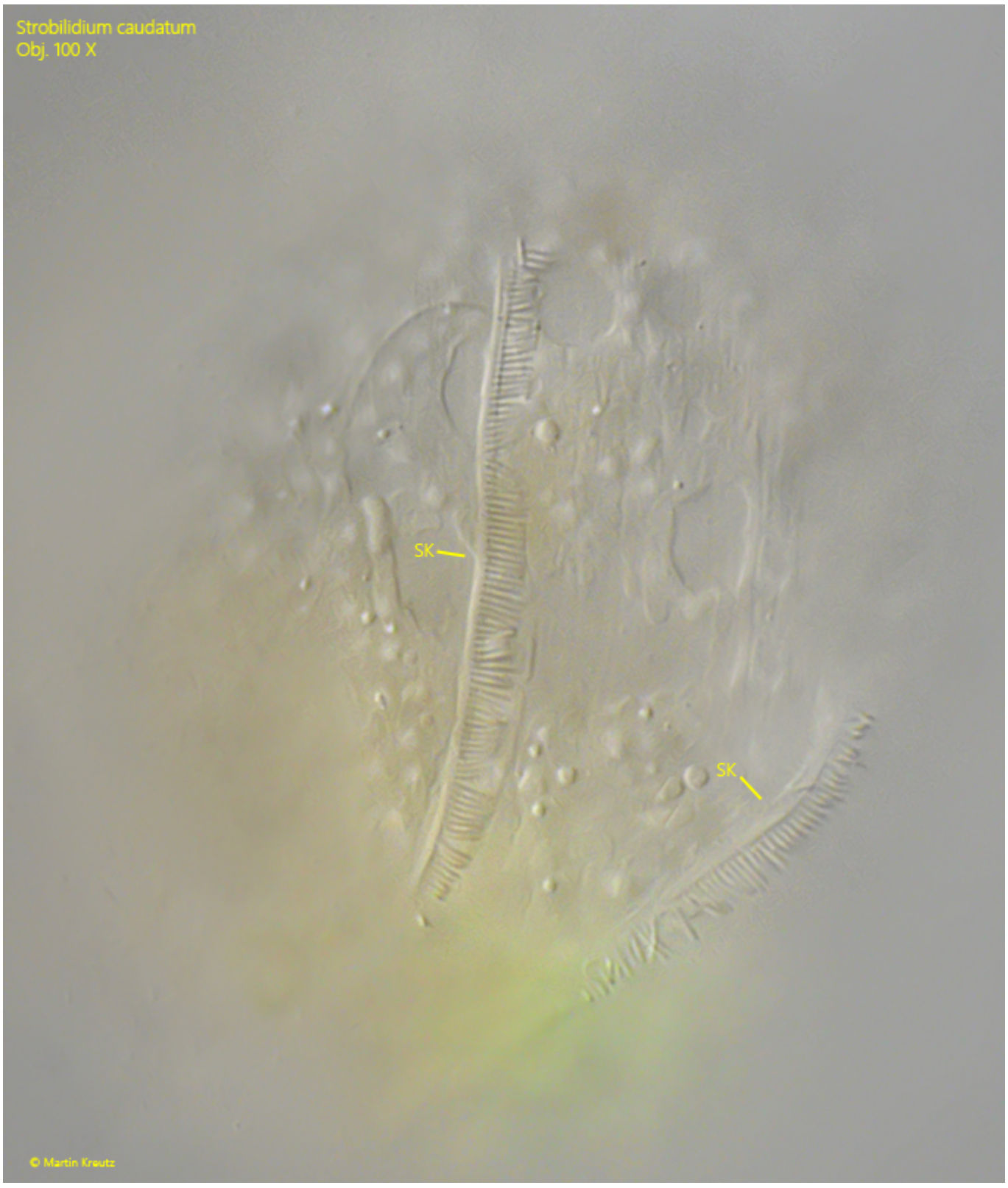


Fig. 8: *Strobilidium caudatum*. The somatic kineties (SK) are spiral ribs with short, bristle-like cilia. Obj. 100 X.

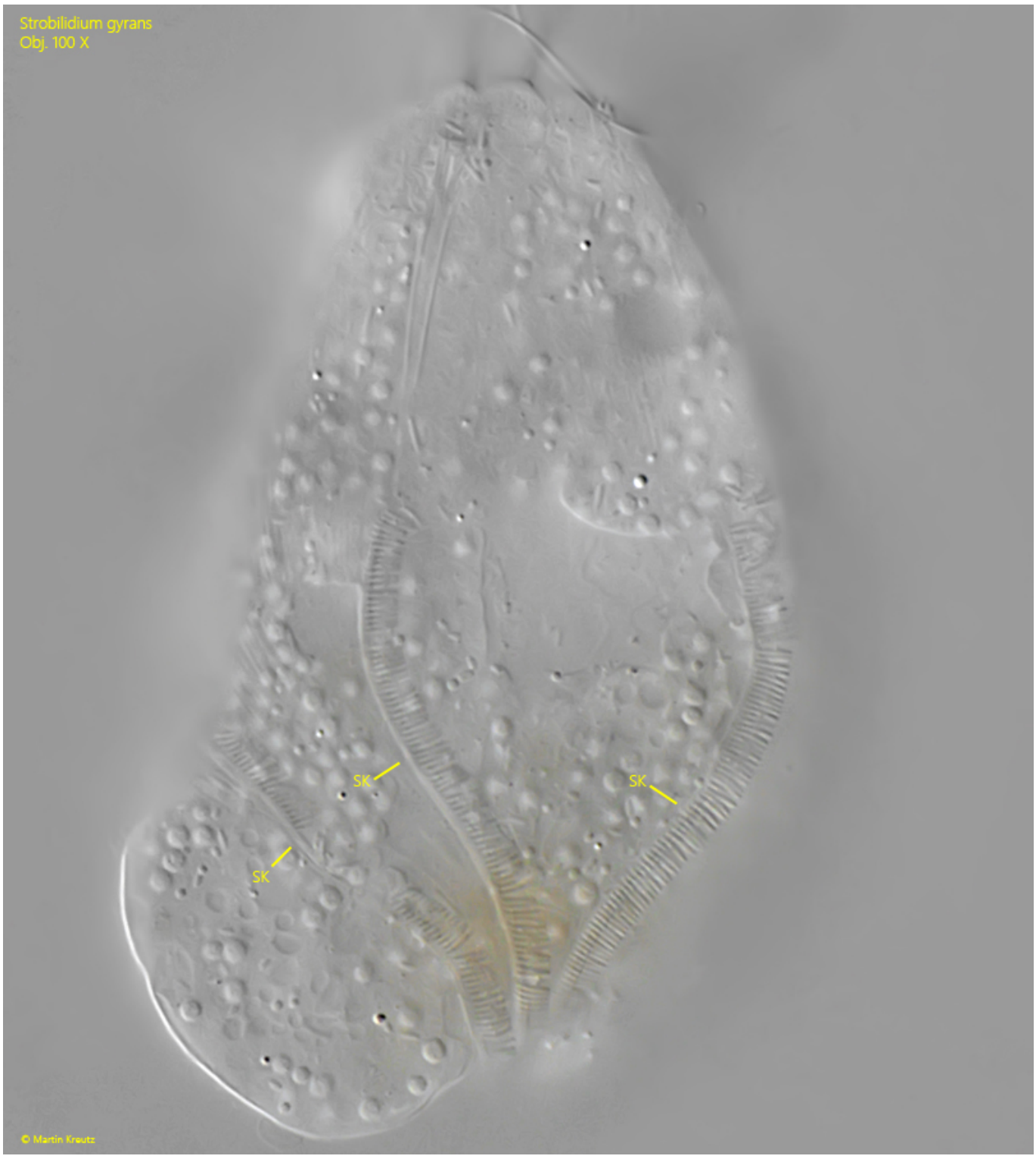


Fig. 9: *Strobilidium caudatum*. The somatic kineties (SK) in a second squashed specimen. All the bristle-like cilia are directed to the left. Obj. 100 X.

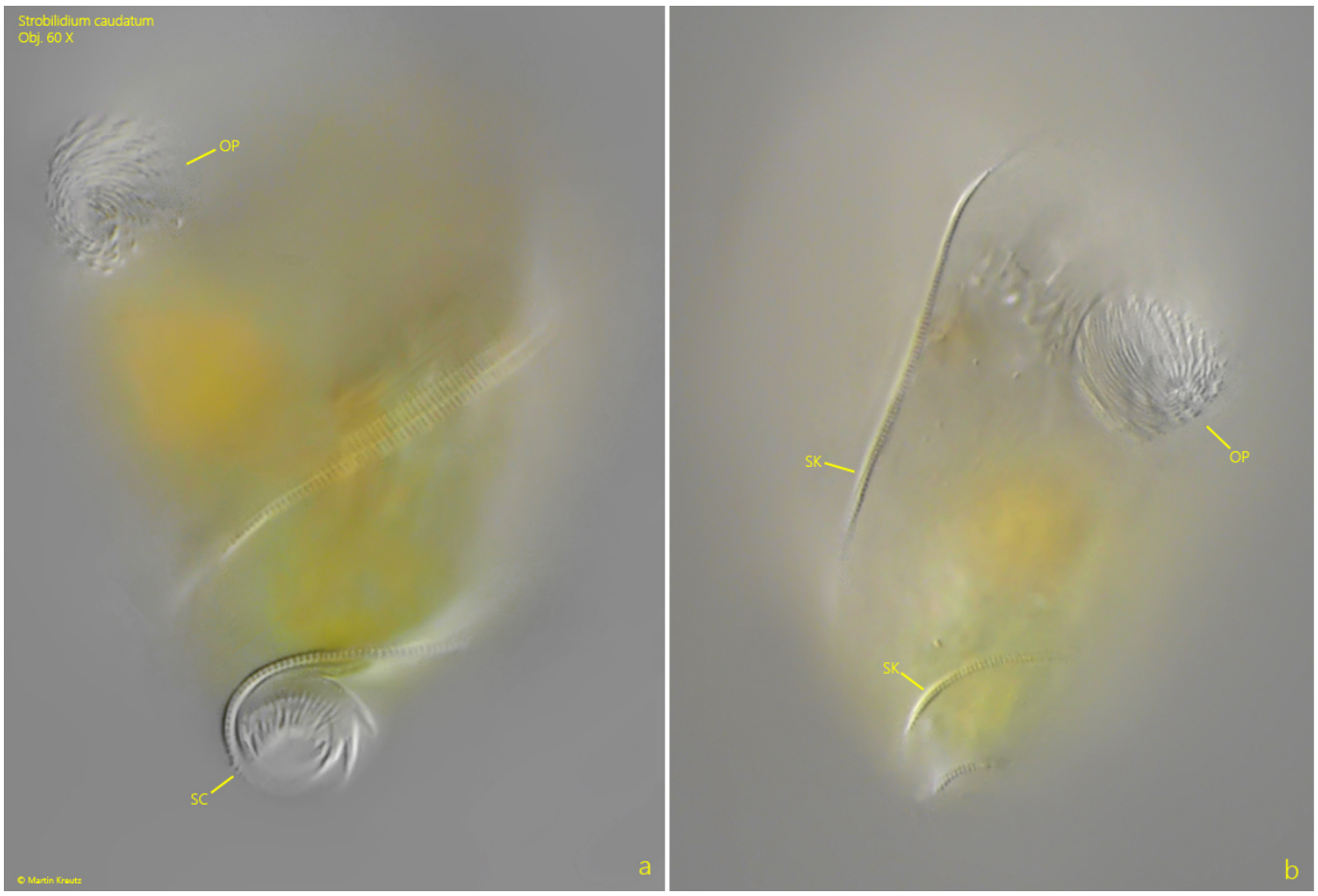


Fig. 10 a-b: *Strobilidium caudatum*. Two focal planes on the somatic kineties (SK) and the posterior scopula (SC) in a slightly squashed specimen. The somatic kineties running left-handed to the posterior pole and form the so called scopula. The scopula is able the secret a thin mucous thread. OP = oral primordium. Obj. 60 X.

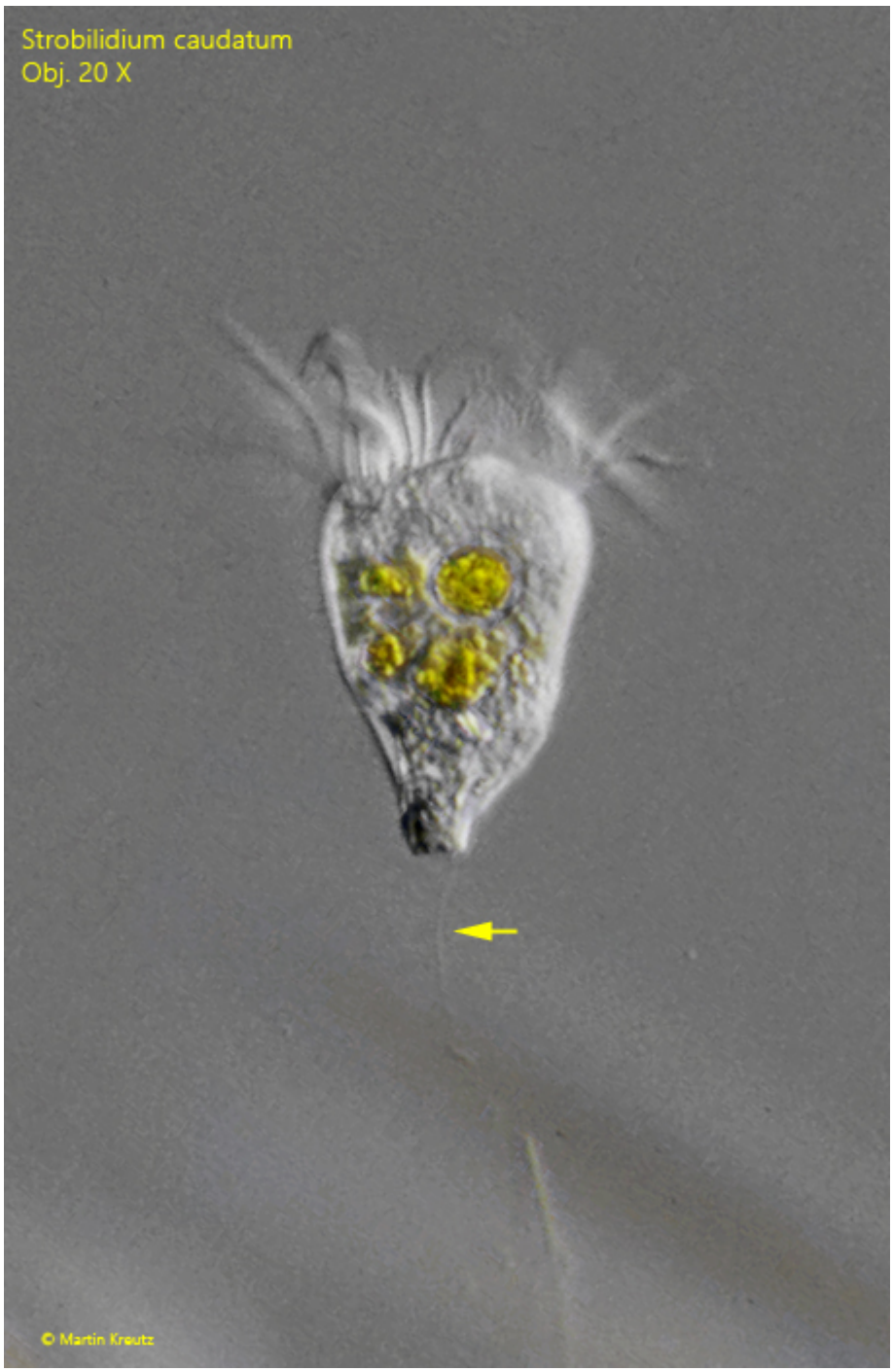


Fig. 11: *Strobilidium caudatum*. This specimen is attached to the substrate via a very thin mucous thread (arrow) formed by the scopula. Obj. 20 X.

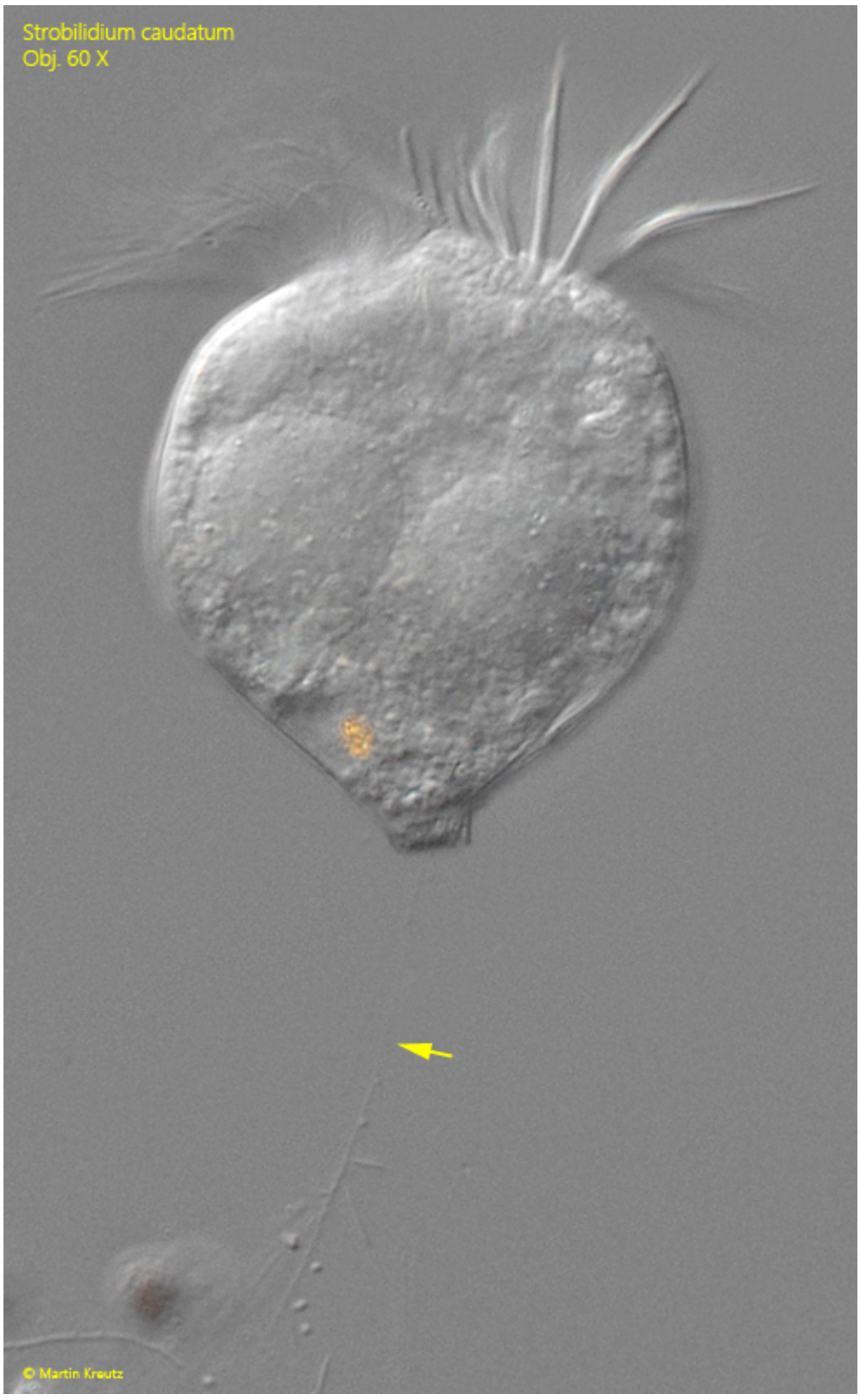


Fig. 12: *Strobilidium caudatum*. This second specimen with a thin mucous thread (arrow). Obj. 60 X.



Fig. 13: *Strobilidium caudatum*. The horseshoe-shaped macronucleus (Ma) lies transversely beneath the adoral zone of membranelles. Obj. 100 X.