Asterococcus limneticus Smith, 1918

Most likely ID: n.a.

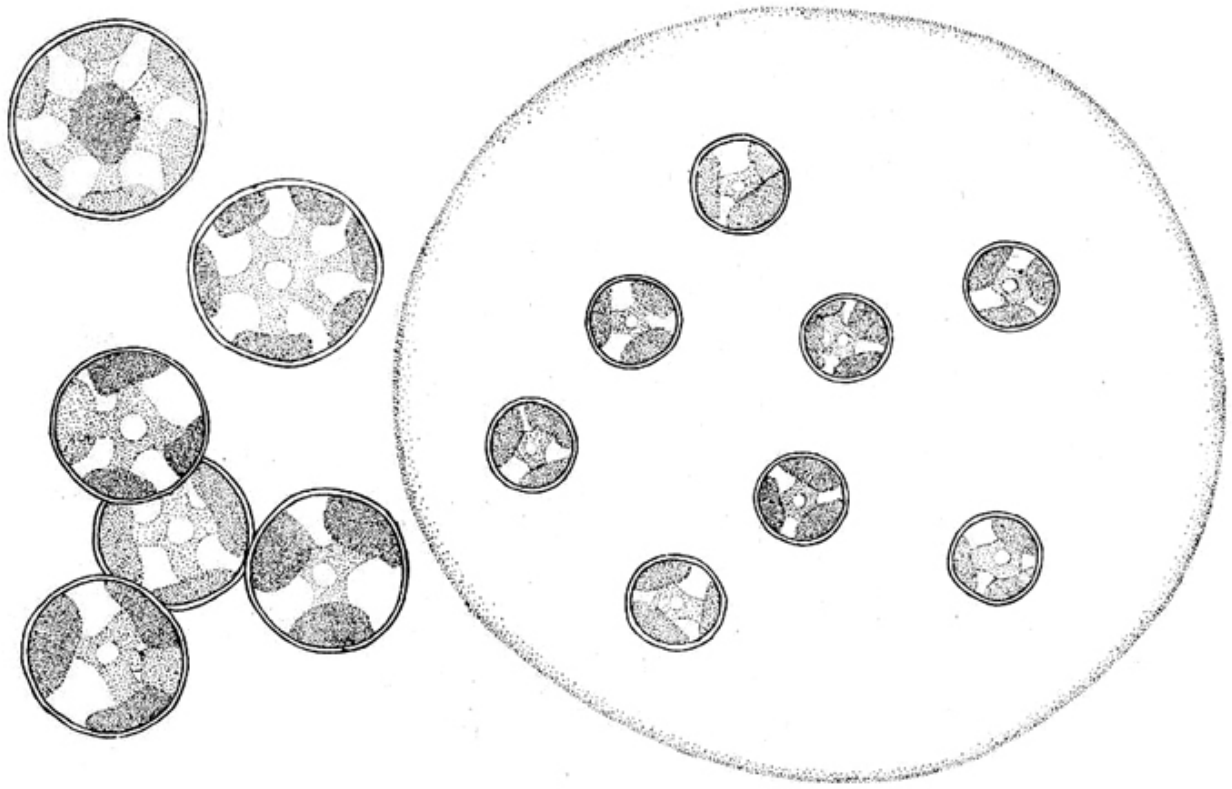
Synonym: n.a.

Sampling location: Simmelried

Phylogenetic tree: *Asterococcus limneticus*

Diagnosis:

- colonies of 4–16 cell in unlaminated mucilage, 50–125 µm
- cells clearly separated in colony
- cells oval or spherical, diameter 10–25 µm
- chloroplast star-shap, radiating arms expanded to periphery
- one central pyrenoid (often covered with starch)
- eyespot absent (only rarely present)
- 2 contractile vacuoles per cell



Asterococcus limneticus

I find *Asterococcus limneticus* very frequently but only in the Simmelried. The colonies are quite conspicuous because the cells are comparatively large (about 20 µm) and they are clearly separated from each other in the mucilage.

The cells have two distinct contractile vacuoles in the periphery, which are always closely adjacent (s. fig. 3 b). They usually pulsate alternately. The chloroplast is star-shaped and columnar arms arise from the center and extend to the cell wall. If the focal plane is on the periphery of the cells, these “columns” become visible in apical view (s. figs. 2 a, 3 a and 4 b). In the center of the chloroplast there is a clearly visible pyrenoid, which is often covered by starch grains (s. fig. 5).

The very similar species *Asterococcus superbus* differs from *Asterococcus limneticus* only by the clearly layered mucilage. The mucilage layers build up concentrically. In *Asterococcus limneticus*, only young colonies show a hint of layering, which disappears in older colonies.

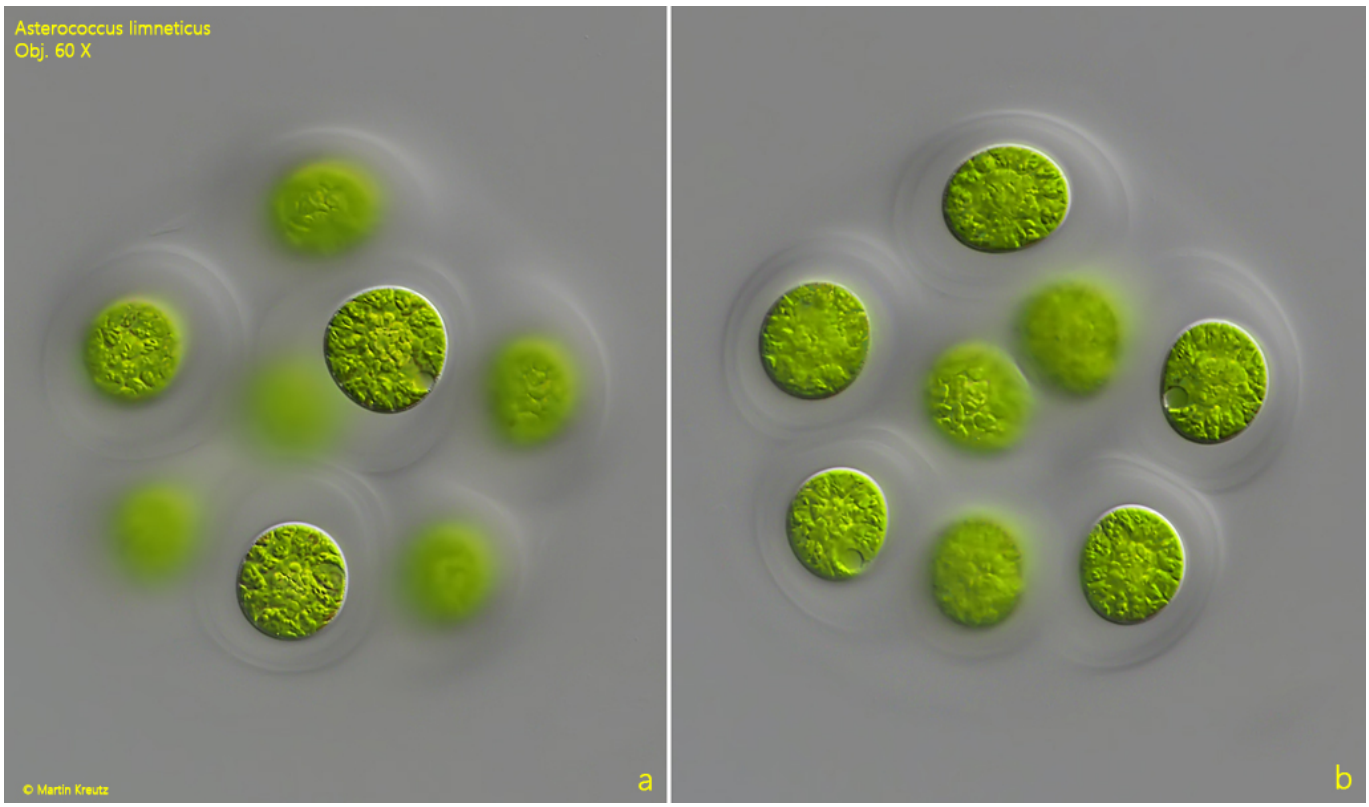


Fig. 1 a-b: *Asterococcus limneticus*. D = 100 µm (of colony). Two focal planes of a slightly squashed colony of 8 cells. In young colonies the mucilage is weakly laminated. Obj. 60 X.

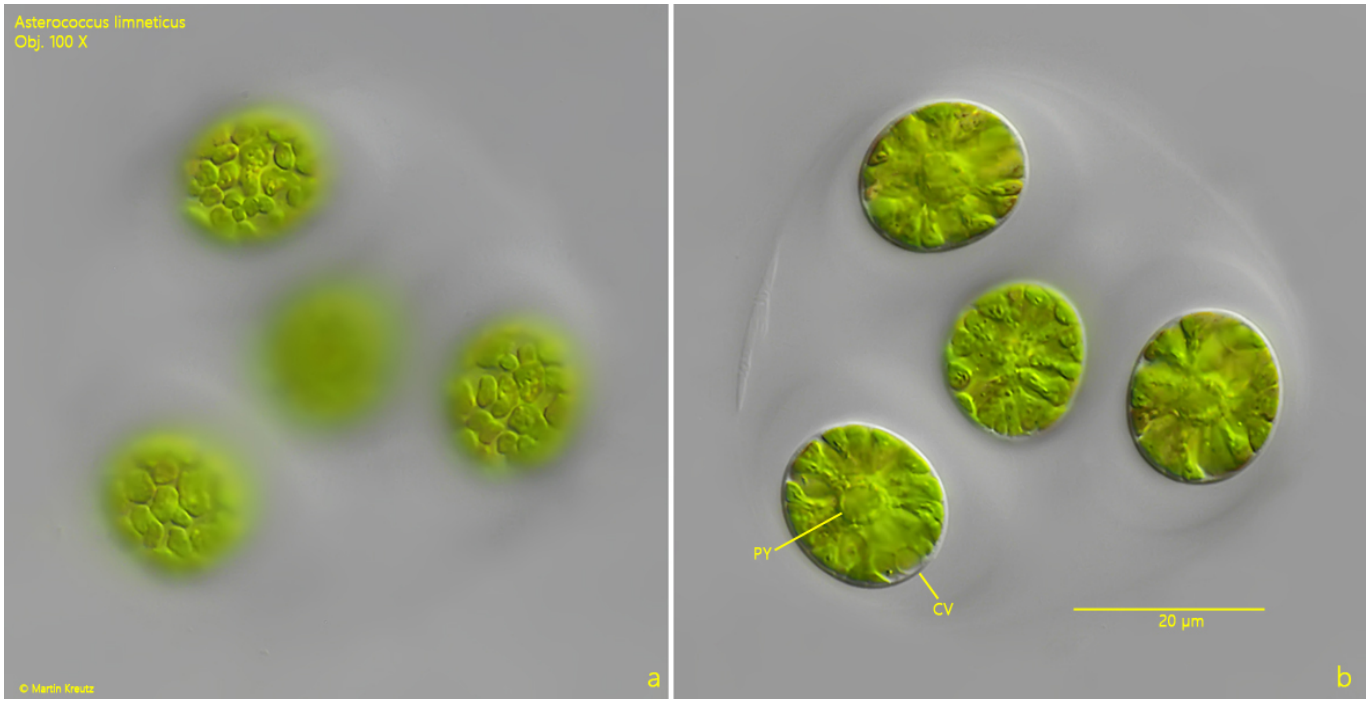


Fig. 2 a-b: *Asterococcus limneticus*. D = 15–18 µm (of cells). A colony of 4 slightly oval cells. CV = contractile vacuole, PY = pyrenoids. Obj. 100 X.

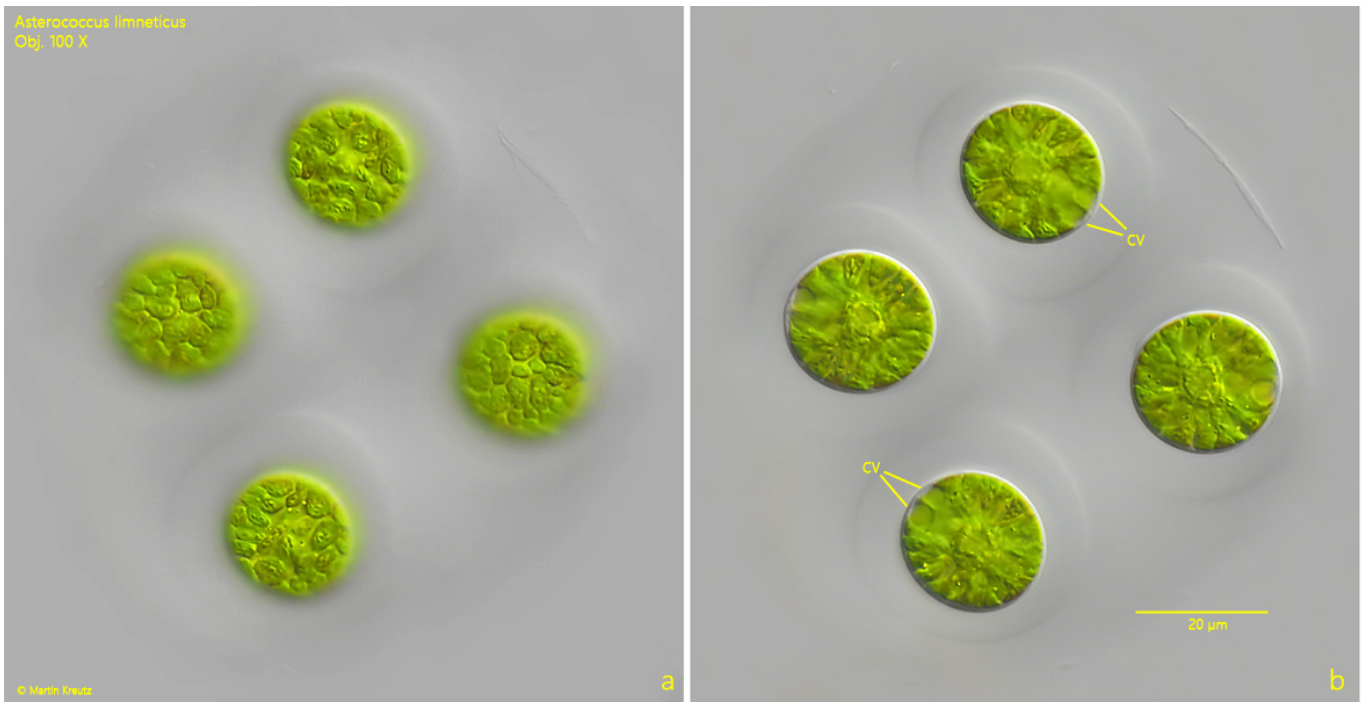


Fig. 3 a-b: *Asterococcus limneticus*. D = 18–20 µm (of cells). A second colony of 4 spherical cells. Note the two contractile vacuoles (CV) per cell. Obj. 100 X.

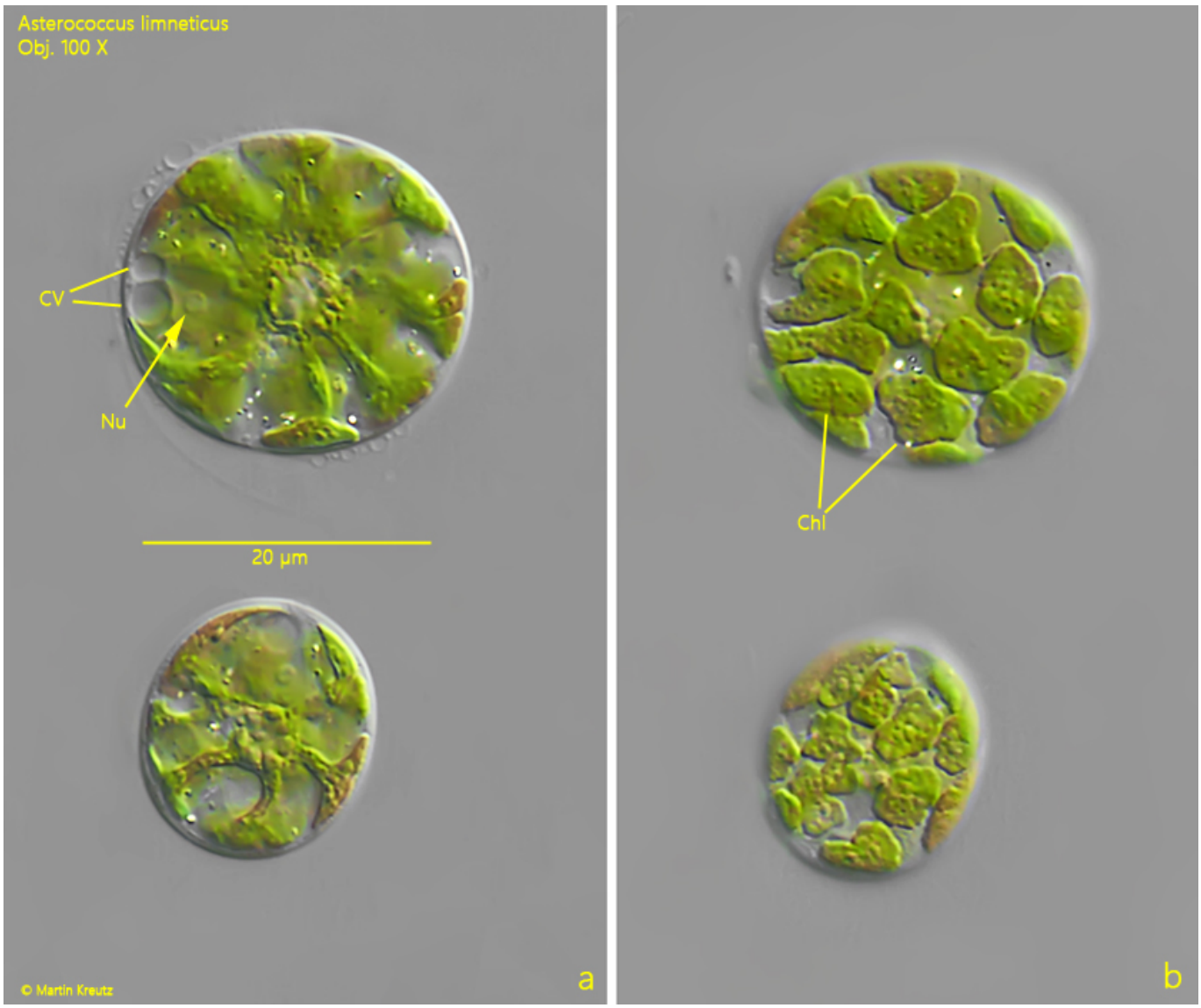


Fig. 4 a-b: *Asterococcus limneticus*. D = 19–25 µm. Two focal planes of two slightly squashed cells. A second colony of 4 spherical cells. Note the „arms“ of the star-shaped chloroplast (Chl) reaching to the cell wall. CV = contractile vacuoles, Nu = nucleus. Obj. 100 X.

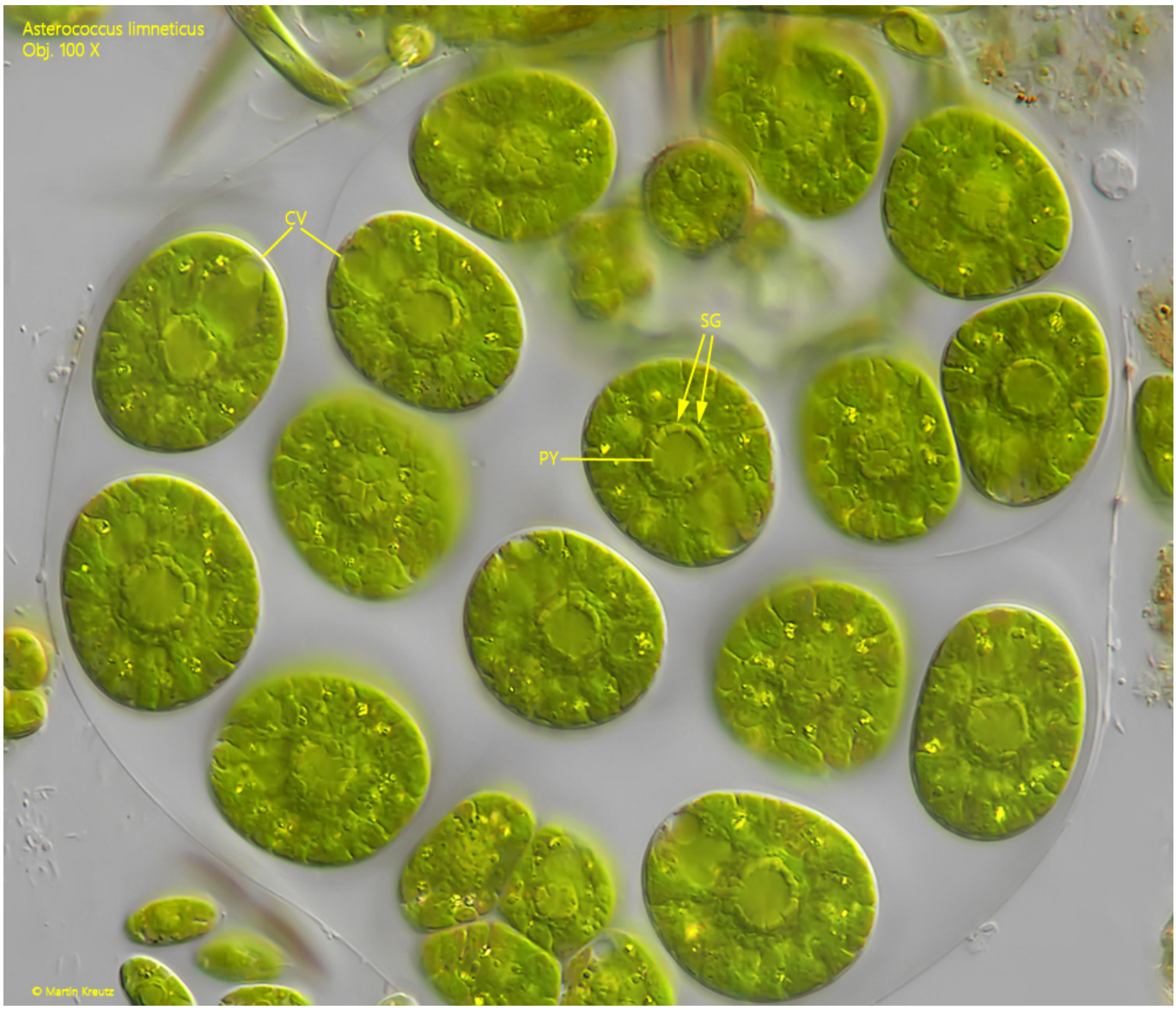


Fig. 5: *Asterococcus limneticus*. A squashed colony of 16 cells. One cell is in the process of cell division. Note the starch grains (SG) in the periphery of the central pyrenoid (PY). Obj. 100 X.