

***Ileonema simplex* Penard, 1922**

**Most likely ID:** n.a.

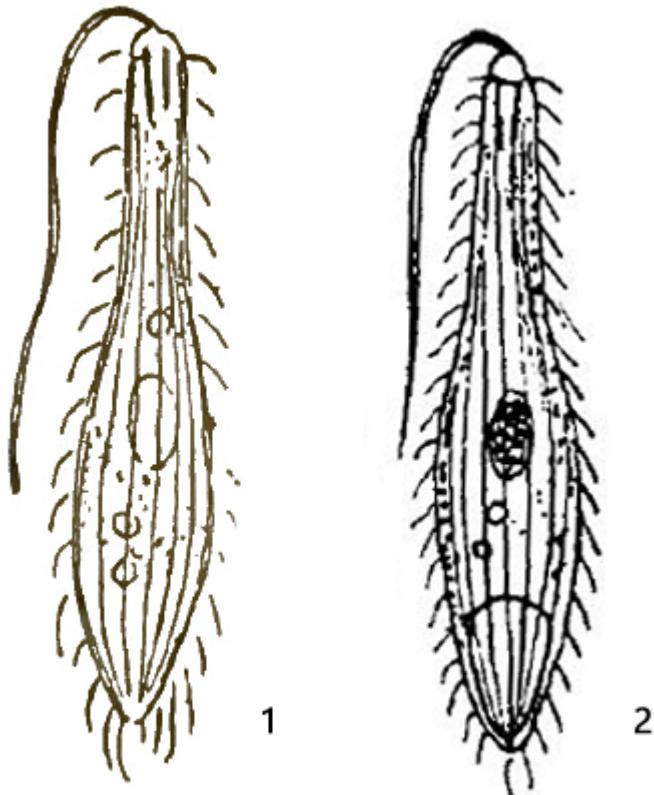
**Synonym:** —

**Sampling location:** [Simmelried](#)

**Phylogenetic tree:** not available

**Diagnosis:**

- length 75-190 µm
- body lageniform, contractile
- one terminal CV
- one oval macronucleus with one globular micronucleus attached to macronucleus
- cortex with mucilaginous layer with lepidosomes
- a conspicuous flagellum-like, retractable mouth process



1) after Penard

2) after Kahl

### Ileonema simplex

The first describer Eugène Penard found only one specimen of *Ileonema simplex* in 1916, on which his drawing and description is based. Kahl later did not find this species himself, but took over the drawing and description from Penard. In November 1999 I discovered *Ileonema simplex* in a small brown water puddle located in Simmelried, which was overgrown with *Sphagnum* moss (assigned as pond **4**, s. [Simmelried](#)).



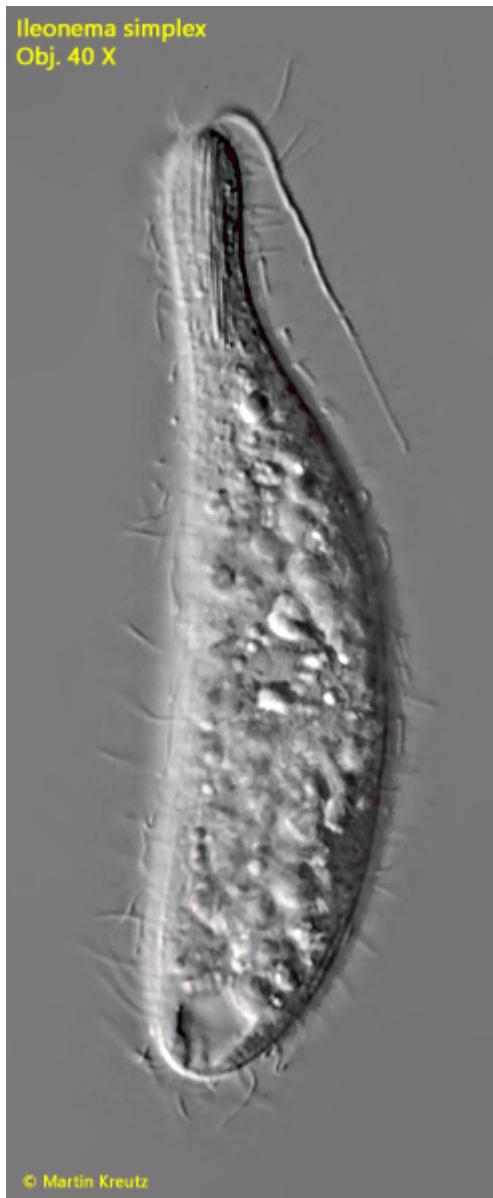
**Fig. 1:** *Illeonema simplex*. The brown water puddle in Simmelried where *Illeonema simplex* was found between 1999–2000.

Most of the specimens were found in squeezed *Sphagnum* moss. After a few days at room temperature, small flakes, about 2 mm in size, floated near the water surface of the samples, harboring an extraordinary diversity of species from ciliates, flagellates and rotifers. Among them, *Illeonema simplex* was found in large numbers. About 50 specimens were present in one of these flakes. After the year 2000 the species disappeared again and no more specimens could be found since then.

Due to the flagellum-like mouth process *Illeonema simplex* cannot be misidentified. This mouth flagellum is clearly visible even at lower magnifications. It has an average length of 30-40  $\mu\text{m}$ . It tapers evenly towards the end. However, under no circumstances the mouth flagellum is twisted as Kahl describes it for *Illeonema dispar*. A confusion with *Illeonema ciliata* can also be excluded, because this species has two macronuclei.



**Fig. 2 a-b:** *Illeonema simplex*. L = 150  $\mu\text{m}$  (without mouth flagellum), freely swimming specimens. Obj. 40 X.



**Fig. 3:** *Ileonema simplex*. L = 140  $\mu$ m (without mouth flagellum), a more contracted, freely swimming specimen. Obj. 40 X.



**Fig. 4 a-b:** *Ileonema simplex*. L = 181  $\mu$ m (without mouth flagellum). This specimen is burrowing in a detritus flake. Obj. 40 X.

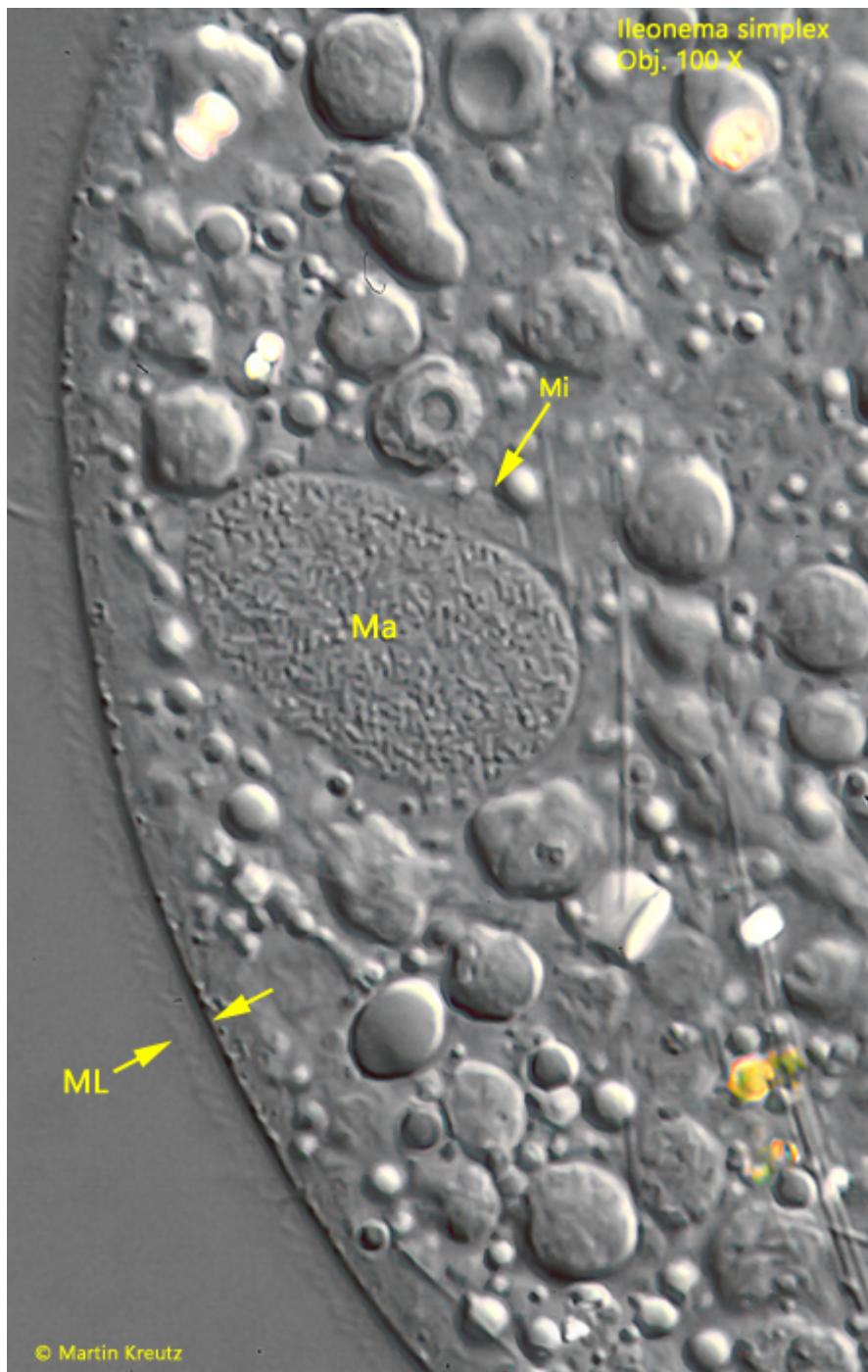
Since many specimens of *Ileonema simplex* were available in the locality, a morphometric survey could be performed. The survey was done with the 40 X objective and exclusively on freely swimming specimens. Only the measurement of the macronucleus had to be done on specimens with little squeezing. The results are summarized in table 1.

Tab 1: Morphometric data of *Ileonema simplex*.

Parameter	n	Average ( $\mu\text{m}$ )	Min ( $\mu\text{m}$ )	Max ( $\mu\text{m}$ )
Body length	28	141	98	191
Body width	28	26	15	34
Macronucleus length	18	18	15	22
Macronucleus width	18	11	20	22
Length mouth flagellum	10	37	20	54

I was able to examine the mouth flagellum in detail. It appears to be made of excreted mucus or plasm. It is by no means actively motile and may also be retracted, which can be observed with increasing pressure on the coverslip. At the origin, the organelle is smooth and homogeneous, but may be dissected toward the distal end. Moreover, it appears that these segmented mucus secretions are attached to a kind of filament. Despite intensive observation of about 100 specimens, no clues emerged as to the function of the organelle, such as prey capture. A tactile function seems to be out of question. I could often observe touching of the mouth flagellum by potential prey organisms (ciliates, flagellates), but this remained without any reaction. *Illeonema simplex* swims slowly and is very flexible. The ciliate penetrates cracks and cavities of detritus flakes and *Zoogloea* flakes, in which it moves back and forth. In any case, during this searching movement the flagellum is only passively dragged along and there is nothing to indicate a sensory function. Also what *Illeonema simplex* feeds on could not be determined.

*Illeonema simplex* is member of the family Trachelophyllidae. Ciliates in this family are covered with a mucilaginous layer containing lepidosomes (epicortical scales). The lepidosomes of *Illeonema simplex* cannot be seen in detail with light microscopy but at higher magnification the mucilaginous layer appears “rough” by the lepidosomes.



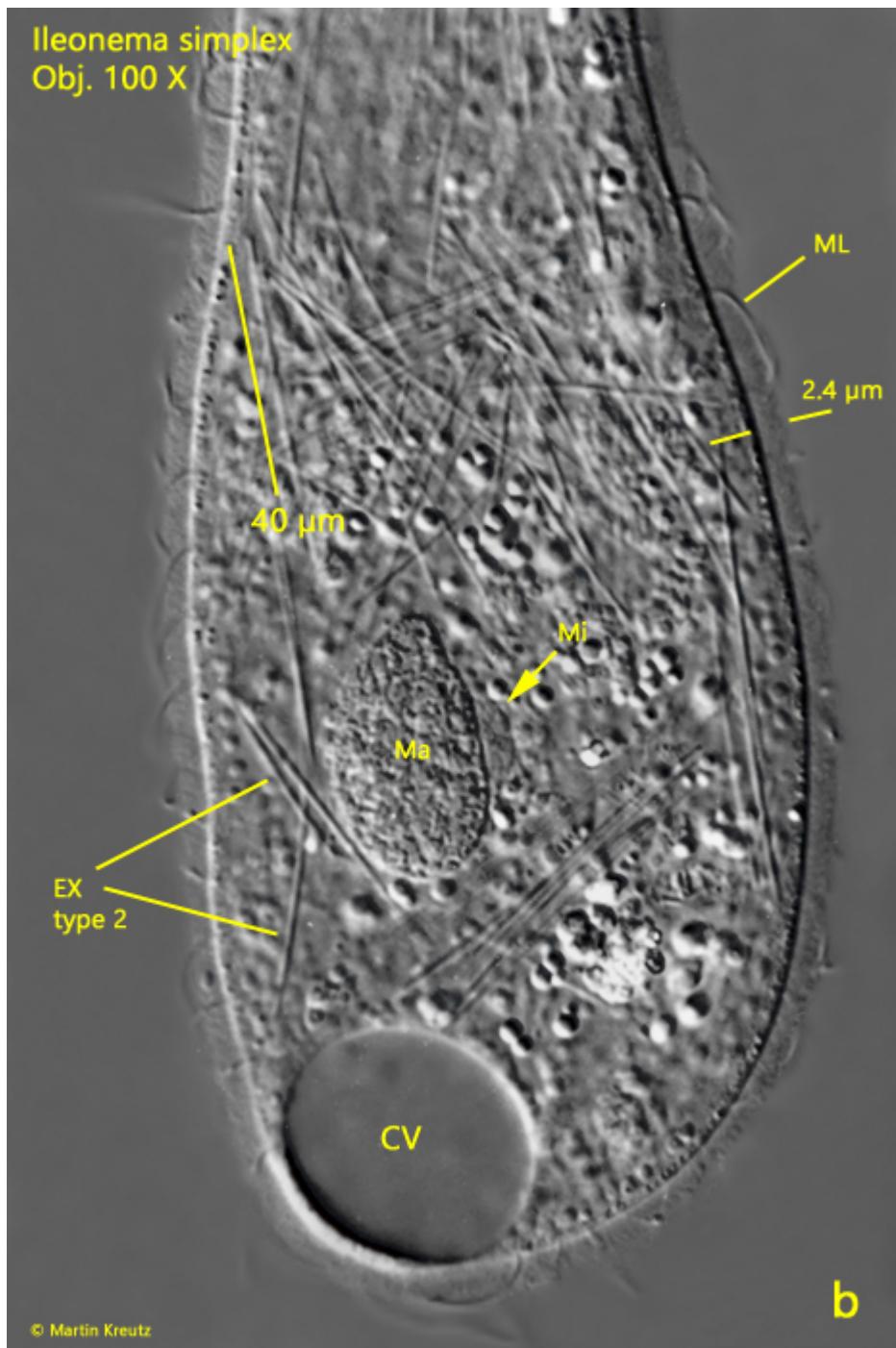


**Fig. 5 + 6:** *Ileonema simplex*. The mucilaginous layer (ML) is about 2.5  $\mu\text{m}$  thick.  
Ma = macronucleus; Mi = micronucleus. Obj. 100 X.

The oral bulge of *Ileonema simplex* is equipped with a bundle of 21 – 24  $\mu\text{m}$  long, rod-shaped extrusomes. In the plasm of some specimens a second type of rod-shaped extrusomes with a length of about 40  $\mu\text{m}$  was detected.

*Ileonema simplex*  
Obj. 100 X





**Fig. 7 a-b:** *Illeonema simplex*. In the oral bulge a bundle of rod-shaped extrusomes with a length of 21 – 24  $\mu\text{m}$  is present (a) and in the plasm rod-shaped extrusomes with a length of about 40  $\mu\text{m}$  (b). EX = extrusomes, Ma = macronucleus, Mi = micronucleus, ML = mucilaginous layer. Obj. 100 X.

Penard mentions in his original description of *Illeonema simplex* that the widely spaced cilia would be longer at the anterior and posterior ends of the ciliate than in the mid-body. I cannot confirm this. The cilia are of the same length over the whole body (about 15  $\mu\text{m}$ ).

*Illeonema simplex*

Obj. 40 X



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**Fig. 8:** *Illeonema simplex*. The widely spaced cilia are soft with a constant length of 15–18  $\mu\text{m}$  over the whole body. Obj. 40 X.