

## Family Apertospathulidae FOISSNER, XU & KREUTZ, 2005

2005 Apertospathulidae FOISSNER, XU & KREUTZ, J. Eukaryot. Microbiol. 52: 12 – Type genus (by original designation): *Apertospathula* FOISSNER, AGATHA & BERGER, 2002.

**Diagnosis:** Spathidiina with lasso-shaped oral bulge and circumoral kinety open ventrally.

**Remarks:** FOISSNER et al. (2005b) classified the genera *Apertospathula*, *Longispatha*, and *Rhinothrix* into a new family, the Apertospathulidae, characterized by a lasso-shaped oral bulge and circumoral kinety, a unique feature not found in any of the described haptorid and spathidiid families. Thus, this family is more distinct than several other spathidiid families, for instance, the Arcuospathidiidae and Pharyngospathidiidae.

*Apertospathula* highly resembles small *Spathidium* species, except of the ventrally opened circumoral kinety. In contrast, *Longispatha* and *Rhinothrix* resemble the spathidiid families Bryophyllidae and Perispiridae because the oral bulge and the circumoral kinety basically extend whole body length (FOISSNER & LEI 2004, WIRNSBERGER et al. 1984). However, the Bryophyllidae and Perispiridae have a complete oral bulge and circumoral kinety, while the left half of the bulge and circumoral kinety is distinctly shortened in the Apertospathulidae, which thus possibly evolved from a *Bryophyllum*-like ancestor. This appears comprehensible in *Longispatha* and *Rhinothrix*, while *Apertospathula* spp. look highly similar to *Spathidium* spp. Thus, we cannot exclude that *Apertospathula* evolved from a different ancestor and the family Apertospathulidae is biphyletic.

The sigmoidal oral apparatus of *Rhinothrix* resembles that of *Perispira*, another aberrant spathidiid genus (WIRNSBERGER et al. 1984). However, *Perispira* has not only a complete oral bulge and circumoral kinety but also spiralized somatic ciliary rows, while those of *Rhinothrix* extend meridionally. This is achieved by the insertion of some shortened kineties in the curves of the bulge (Fig. 105q, s) and suggests a different evolutionary history of the two genera.

The family consists of 3 genera with a total of 14 species, most of which have been described recently or will be described here for the first time. Fourteen species are a considerable gain, confirming FOISSNER et al. (2002) that, especially, *Apertospathula* contains many species most of which are still undescribed.

### Key to genera

- 1 Oral bulge distinctly projecting dorsally, forming the palpus oralis. Oral bulge and circumoral kinety extend spirally ..... *Rhinothrix*
  - Without palpus oralis. Oral bulge and circumoral kinety extend meridionally ..... 2
- 2 Mouth and circumoral kinety (oral bulge) distinctly shorter than postoral area. Right half of circumoral kinety only slightly longer than left. Appears *Spathidium*-like ..... *Apertospathula*
  - Right half of circumoral kinety and oral bulge extend to posterior body end, left half confined to anterior body half. Appears *Arcuospathidium*-like ..... *Longispatha*

## *Apertospathula* FOISSNER, AGATHA & BERGER, 2002

2002 *Apertospathula* FOISSNER, AGATHA & BERGER, Denisia, 5: 318 – Type species (by original designation): *Apertospathula inermis* FOISSNER, AGATHA & BERGER, 2002.

**Improved diagnosis:** Indistinctly spatulate, flexible Apertospathulidae with brush located dorsally or slightly dorsolaterally; individual brush rows without or with very short anterior tail of ordinary cilia. Mouth (oral bulge) and circumoral kinety distinctly shorter than body proper, extend meridionally; right half of circumoral kinety slightly longer than left.

**Etymology:** Composite of the Latin nouns *apertum* (open field) and *spatha* (spatula), and the diminutive suffix *ula*, referring to the ventrally opened circumoral kinety and the similarity to small species of the genus *Spathidium*. Feminine gender.

**Remarks:** The main feature of this genus is the circumoral kinety, which is shortened at left and thus open ventrally. The ciliary pattern of *Apertospathula* resembles that of *Arcuospathidium* (somatic and oral ciliature distinctly separate) and *Spathidiodes*, a still poorly known genus differing from other spathidiids mainly by the bright, rigid cortex (Fig. 94).

Three well-defined *Apertospathula* species have been described (FOISSNER et al. 2002). One of these, *A. dioplites*, has been referred to the new genus *Longispatha* by FOISSNER et al. (2005b). Five new species are added, and the reinvestigation of *Spathidium swarezewskyi* showed that it belongs to *Apertospathula* too.

### **Key to species** (careful live observation indispensable)

- 1 Body  $\geq 100\ \mu\text{m}$  long in vivo. Extrusomes present. Six or more ciliary rows ..... 2
  - Length about  $55\ \mu\text{m}$ . Extrusomes lacking (observe carefully!). About six ciliary rows ..... *A. inermis*
- 2 Body  $\geq 100\ \mu\text{m}$  long in vivo. Extrusomes rod-shaped and longer than  $5\ \mu\text{m}$  ..... 3
  - Body  $< 80\ \mu\text{m}$  long in vivo. Extrusomes of various shapes and inconspicuous because  $\leq 3\ \mu\text{m}$  long ..... 5
- 3 Two size types ( $12\ \mu\text{m}$  and  $7\ \mu\text{m}$ ) of rod-shaped extrusomes ..... 4
  - Extrusomes  $5\text{--}8\ \mu\text{m}$  long, rod-shaped, and slightly curved ..... *A. swarezewskyi*
- 4 Many minute palps between dorsal brush rows ..... *A. lajacola*
  - Oral bulge with distinct concavity ..... *A. pelobia*
- 5 Body  $< 80\ \mu\text{m}$  long in vivo. 5–7, usually 6 ciliary rows ..... 6
  - Body  $< 80\ \mu\text{m}$  long in vivo. 8–16 ciliary rows ..... 7
- 6 Extrusomes about  $1.5\ \mu\text{m}$  long. Brush bristles about  $1\ \mu\text{m}$  long ..... *A. armata*
  - Extrusomes about  $0.7\ \mu\text{m}$  long. Brush bristles up to  $5\ \mu\text{m}$  long ..... *A. similis*
- 7 Body clavate. About 15 ciliary rows. Brush bristles very conspicuous because up to  $15\ \mu\text{m}$  long (do not mix with somatic cilia!) ..... *A. longiseta*
  - Body usually oblong or obovate, rarely clavate. 8–12 ciliary rows. Brush bristles up to  $3\ \mu\text{m}$  long ..... 8