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Taxonomic and nomenclatural revision of Sládeček's list of ciliates (Protozoa: Ciliophora) as indicators of water quality

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Abstract

A taxonomic and nomenclatural revision of Sládeček's *et al.* (1981) and Wegl's (1983) lists of ciliates (Protozoa: Ciliophora) as indicators of water quality has been performed. The original reference, important synonyms, and modern taxonomic literature are provided for each of the 378 taxa recognized. The results of this revision are summarized in a table which shows the correct (modern) name, author, and date of publication of each species as well as its saprobity, its saprobic valency, its indicative weight, and its saprobic index.

1. Introduction

The saprobic system of water quality was founded by Kolkwitz & Marsson (1908, 1909) and was soon widely used. The most noteworthy revisions and extensions of this system are those of Kolkwitz (1950), Liebmann (1951), Sládeček (1973), and Sládeček *et al.* (1981). Recently, Wegl (1983) and Mauch *et al.* (1985) provided simplified German versions of Sládeček's *et al.* (1981) work and amended their list of indicator species with some newer data.

Sládeček *et al.* (1981) and Wegl (1983) are outstanding practitioners, but have never worked on taxonomy and nomenclature of ciliates. Thus, they used the old, now rather outdated monographs of Kahl (1930–35) to name the ciliates included in their lists of indicators of saprobity. Kahl, however, made many nomenclatural mistakes. A preliminary examination of Sládeček's *et al.* (1981) and Wegl's (1983) lists showed at once that a great number of taxa are more or less misquoted, outdated or wrong. This motivated me to revise and to update these lists, which are widely used, especially in Central Europe.

One might think that it is not very important if the nomenclature and taxonomy of a species are more or less incorrect. It is, however, a little ridiculous if ecologists give their chemical and physical data with two points behind the comma, but neglect even the basic rules of nomenclature and taxonomy.

2. Major changes since Kahl

Ciliatology has made great progress since Kahl (1930–35) due to the use of silver impregnation techniques and the electron microscope. It is beyond the scope of this paper to describe all the major and minor changes. For this and the bewildering number of recent suggestions of suprafamilial classification of the Ciliophora, the reader is referred to Corliss (1979), Small & Lynn (1985), and Hausmann (1985). There exists, in fact, at present no generally accepted system for the ciliates and the protozoa in general. The interesting trend to revive the term Protista to include Protozoa, Algae, and Fungi is competently discussed in Corliss (1984).

In the following paragraphs only those changes are mentioned which are important for the understanding of the present paper.

2.1. Splitting of genera

A great number of genera have been split since Kahl (1930–35). The most important include: *Chilodonella* (*Chilodonella* Strand, 1928; *Trithigmostoma* Jankowski, 1967b; *Pseudochilodonopsis* Foissner, 1979b), *Cohnilembus* (*Cohnilembus* Kahl, 1933; *Pseudocohnilembus* Evans & Thompson, 1964; *Kahlilembus* Grolière & Coûteaux, 1984), *Glaucoma* (*Glaucoma* Ehrenberg, 1830; *Epenardia* Corliss, 1971), *Lacrymaria* (*Lacrymaria* Bory de St. Vincent, 1826; *Phialina Bory de St. Vincent,* 1826; *Lagynus* Quennerstedt, 1867), *Metopus* (*Metopus* Claparède & Lachmann, 1858; *Bothrostoma* Stokes, 1887c; *Brachonella* Jankowski, 1964b), *Nassula* (*Nassula* Ehrenberg, 1833; *Nassulopsis* Fauré-Fremiet, 1959; *Obertrumia* Foissner & Adam, 1981), *Spathidium* (*Spathidium* Dujardin, 1841; *Supraspathidium* Foissner & Didier, 1981; *Arcuospathidium* Foissner, 1984a; *Epispathidium* Foissner, 1984a), *Urostyla* (*Urostyla* Ehrenberg, 1830; *Paraurostyla* Borror, 1972b; *Pseudourostyla* Borror, 1972b), *Vorticella* (*Vorticella* Linnaeus, 1767; *Pseudovorticella* Foissner & Schiffmann, 1974).

The pleuronematid genus *Hemiophrys* Wrześniowski, 1870 is now considered to be a synonym of *Amphileptus* Ehrenberg, 1830 (Foissner, 1984b). Among the hypotrichs, most species of *Keronopsis* have been transferred to *Holosticha* (Hemberger & Wilbert, 1982), and the long abandoned genus *Steinia* Diesing, 1866 is now firmly established within the Oxytrichidae Bory de St. Vincent, 1825 (Foissner, 1982b, 1984a).

2.2. Sibling species

Recent biochemical and genetical studies showed that some of the most widespread and best known ciliates, *Paramecium aurelia, Tetrahymena pyriformis,* and *Stylonychia mytilus,* consist of a complex of sibling species most of which are nearly or completely inseparable by classical morphological methods (Sonneborn, 1975; Gates & Berger, 1976; Nanney & McCoy, 1976; Ammermann & Schlegel, 1983; Wirnsberger *et al.,* 1986). The nomenclatural problems associated with this progress have been carefully analyzed by Corliss & Daggett (1983). I adopt their suggestion that field ecologists should designate such species as member of the '*Paramecium aurelia* complex' (15 species), '*Tetrahymena pyriformis* complex' (17 species), and '*Stylonychia mytilus* complex' (2 species), respectively, if they have not determined the real name of their species. Very likely, there exist a great number of other ciliates which have sibling species. This, of course, could restrict somewhat their use as indicator species. Sibling species could explain, at least partially, the rather broad saprobiological valency of many ciliates. The species of the *Paramecium aurelia* complex, for instance, have rather different ecological demands (e.g. Komala & Przyboś, 1984).

2.3. Nomenclatural rectifications

Corliss (1960, 1961, 1962, 1979) must be credited for the rectification of most of the nomenclatural problems above the species level. The job for the species, however, has yet to be done as shown by some recent investigations (Foissner, 1987a; Foissner & Foissner, 1987) and the present paper. The observance of the rules of the International Code of Zoological Nomenclature (1985) is indispensable for this purpose.

3. Recent textbooks and monographs

The books of Corliss (1979), Madoni (1981), Lee *et al.* (1985), Hausmann (1985), Puytorac *et al.* (1987), and Fenchel (1987) are recommended as a general introduction to the taxonomy and ecology of the Protozoa in general and the ciliates in particular. The known genera of fresh water ciliates are described and figured in Curds (1982) and Curds *et al.* (1983).

Much less recent comprehensive work is available at species level. The monographs of Kahl (1930–35) are still indispensable for this purpose. However, the

number of described species has doubled since then. Thus, at present, many species can be reliably determined only by specialists. But this problem will be solved in the near future, because revision of Kahl's monographs is in progress. In the meantime, the book of Dragesco & Dragesco-Kernéis (1986) and the other monographs cited in this paper should be consulted. The booklets of Bick (1972) and Madoni (1981) may also be of some help, although many drawings are a little superficial and could thus easily cause misidentification. The monographs of Stiller (1971, 1974) and Jankowski (1979, 1981) are unfortunately restricted to those readers who understand Hungarian and Russian, respectively.

Important recent ecological studies on ciliates as indicators of water quality include those of Wilbert (1969), Bick & Kunze (1971), Stössel (1979), Bick & Neumann (1982), Nosek & Bereczky (1981), Foissner *et al.* (1982a), Schönborn (1982), and Albrecht (1984). Comprehensive bibliographies on the ecology of free-living and terrestrial protozoa have been prepared by Finlay & Ochsenbein-Gattlen (1982) and Foissner (1987c).

Methods for the investigation of ciliates, with special regard to the important silver impregnation techniques, have been compiled by Madoni (1981), Curds (1982), and especially by Dragesco & Dragesco-Kernéis (1986).

4. Revision of Sládeček's and Wegl's lists of ciliates as indicators of water quality

4.1. Introductory remarks

All species which are mentioned in Sládeček *et al.* (1981) and/or Wegl (1983) have been considered. The revision follows the scheme described in the next paragraphs.

First the correct (modern) name of the species, its author, and year of publication are given. Next comes the name, the volume, and the page of the journal or book where the species is described. This kind of citation is the best way to avoid nomenclatural errors, because it make it necessary to go really back to the original description. In addition, this way greatly facilitates the recovery of those species which are mentioned in the text of voluminous books or articles (e.g. Stein 1859c, 1867).

SYN = Synonyms of the species and genus are mentioned only, if they are important in the context of the present paper. Other synonyms may be found either in Ehrenberg (1838) and Kahl (1930–35) or in Corliss (1979).

MTL = Modern Taxonomical Literature. First a reference to Kahl (1930–35) is given, whose monographs are still indispensable. Then follows, if available, newer literature which adds significant data to the original description or to Kahl (1930–35). To give the reader some idea about the quality of these works, the abbreviations **DL** (description of living observations only) and **DS** (description of silver impregnated individuals) are used. The letter **R** indicates that no or no good redescription is available. All these species pressingly need a reinvestigation from silver stained material. It should be noted that modern alpha-taxonomy of ciliates depends mainly on various silver staining techniques. These methods allow a deep insight into the organization of the somatic and oral infraciliature (= arrangement of the cilia). Only such species which have been investigated with these methods can be considered as having been reliable described. That does, however, not mean that ciliates can be determined only in silver stained preparations. It is the duty of the taxonomists to give ecologists and practitioners such good keys and hints that a species can be determined also from life. In my experience, this *is* possible in most cases, but is unfortunately more and more neglected by taxonomists, causing a broadening of the already wide cleft between ecologists and taxonomists.

REM = Remarks. These includes notes on taxonomy, ecology, occurrence, and saprobiology.

SLA, WEG = Sladeček *et al.* (1981) and Wegl (1983). This file appears only, if Sládeček's *et al.* (1981) and/or Wegl's nomenclature and/or taxonomy deviates from mine.

4.2. New saprobiological classifications

The following species which I have repeatly found in various running waters and which are not men-

tioned in the lists of Sládeček *et al.* (1981) and Wegl (1983) are included in the present review: *Acineria uncinata, Amphileptus punctatus, Colpidium kleini, C. truncatum, Litonotus crystallinus, Papillorhabdos carchesii, Sphaerophrya stentoris, Uronema parduczi.*

4.3. List of species

Gen.: *Acineria* Dujardin, 1841
Revision of genus: Augustin *et al.* (1987).
A. incurvata Dujardin, 1841, Zoophytes, p. 402.
MTL: Kahl, 1931, p. 195 (DL); Augustin *et al.*, 1987, p. 199 (DS).
REM: Easily mistaken for *Amphileptus* spp. and *Litonotus* spp.
A. uncinata Tucolesco, 1962, Arch. Protistenk., v. 106, p. 10.
MTL: Augustin *et al.*, 1987, p. 206 (DL); Foissner & O'Donoghue, 1988 (DS).
REM: Very common and frequent species, which has probably been often confused with *Litonotus* spp.

Gen.: *Acineta* Ehrenberg, 1833
Revision of genus: Curds (1985).
A. flava Kellicott, 1885, Proc. Am. microsc. Soc., v. 8, p. 40.
MTL: Curds, 1985, p. 92 (DL). – R!
SLA: *Acineta flava* Stokes.
A. grandis Kent, 1882, Manual infusoria II, p. 831.
MTL: Curds, 1985, p. 92 (DL). – R!
A. tuberosa (Pallas, 1766), Elenchus Zoophytorum, p. 105 (*Brachionus tuberosus*).
SYN: *Acineta foetida* Maupas, 1881, Archs. Zool. exp. gén., v. 9, p. 315.
MTL: Collin, 1912, p. 337 (*A. tuberosa* var. *foetida*) (DL); Kahl, 1934, p. 209 (*A. foetida*) (DL); Guilcher, 1951, p. 105 (DS); Curds, 1985, p. 80 (DL).
REM: Synonymy after Curds (1985). This author cites Ehrenberg (1833) as describer, but has Pallas (1766) and Müller (1786), whose *Vorticella tuberosa* is very probably the species under discussion, in his list of synonyms.
SLA & WEG: *Acineta foetida* Maupas.

Gen.: *Acinetides* Swarczewsky, 1928
Revision of genus: Curds (1985).
A. lacustris (Stokes, 1886), Proc. Am. phil. Soc., v. 23, p. 568 (*Acineta l.*).
MTL: Curds, 1985, p. 111 (DL). – R!
REM: Jankowski (1981) assigns this species to the subgenus *Fitonacineta.* This subgenus belongs to the genus *Periacineta,* which is, however, invalid (Curds, 1985).
SLA & WEG: *Acineta lacustris* Stokes.

Gen.: *Actinobolina* Strand, 1928
A. radians (Stein, 1867), Organismus der Infusionsthiere II, p. 169 (*Actinobolus r.*).
MTL: Kahl, 1930b, p. 138 (DL); Holt *et al.*, 1973, p. 521 (DS).
REM: Redescription recommended. Only planktonic; rare.
SLA: *Actinobolina radians* Stein.
WEG: *Actinobolia radians.*
A. vorax (Wenrich, 1929), Biol. Bull., v. 56, p. 390 (*Actinobolus v.*).
MTL: Kahl, 1930b, p. 139 (DL). – R!
REM: Taxonomy and nomenclature see Holt *et al.* (1973).
SLA: *Actinobolina vorax* Wenrich.
WEG: *Actinobolia vorax.*

Gen.: *Amphileptus* Ehrenberg, 1830
A. carchesii Stein, 1867, Organismus der Infusionsthiere II, p. 104.
MTL: Kahl 1931, p. 182 (DL); Canella 1960, p. 47 (DL). – R!
REM: Well studied by Canella (1960), however, redescription of silver stained cells is necessary. Parasitizes on colonial peritrichs.
A. claparedii Stein, 1867, Organismus der Infusionsthiere II, p. 104.
MTL: Kahl, 1931, p. 182 (DL); Canella, 1960, p. 47 (DL). – R!
REM: Same as *A. carchesii.*
A. meleagris (Ehrenberg, 1835), Abh. dt. Akad. Wiss., year 1835, p. 164, 178 (*Trachelius m.*).
MTL: Kahl, 1931, p. 188 (*Hemiophrys m.*) (DL). – R!
SLA & WEG: *Hemiophrys meleagris* Ehrenberg.
A. pleurosigma (Stokes, 1884), Am. mon. microsc.

J., v. 5, p. 124 (*Litonotus p.*).

MTL: Kahl, 1931, p. 186 (*Hemiophrys p.*) (DL); Foissner, 1984b, p. 205 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 177 (DS).

SLA & WEG: *Hemiophrys pleurosigma* Stokes.

A. punctatus (Kahl, 1926), Arch. Protistenk., v. 55, p. 291 (*Lionotus p.*).

MTL: Kahl, 1931, p. 190 (*Hemiophrys punctata*) (DL); Foissner, 1984b, p. 204 (DS).

REM: Parasitizes usually on colonial peritrichs.

A. rotundus (Kahl, 1926) nov. comb., Arch. Protistenk., v. 55, p. 290 (*Lionotus lamella*? var. *rotundus*).

MTL: Kahl, 1931, p. 188 (*Hemiophrys* (*Lionotus*) *rotunda* spec. n.) (DL). – R!

REM: The new combination is based on the clear statement of Kahl (1931) that this species has a 'spica'. The spica, which is formed by the adjoining ciliary rows of the right and the left half of the right body side, is the most prominent character of the genus *Amphileptus* (Foissner, 1984b).

WEG: *Hemiophrys rotunda.*

A. trachelioides (Zacharias, 1894), ForschBer. biol. Stn. Plön, v. 2, p. 78 (*Dileptus t.*).

MTL: Kahl, 1931, p. 182 (DL). – R!

REM: The reinvestigation of silver impregnated cells will very probably show that this species needs a genus of its own or that it should be transferred to the genus *Paradileptus*. Only planktonic.

Gen.: *Askenasia* Blochmann, 1895

A. volvox (Eichwald, 1852), Bull. Soc. impér. nat. Moscou, v. 25, p. 510 (*Trichodina v.*).

MTL: Kahl, 1930b, p. 128 (DL); Tamar 1973, p. 46 (DL). – R!

REM: Nomenclature see Foissner (1987a). Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– – 4 6 –; – 1 6 3 –).

SLAD & WEG: *Askenasia volvox* Claparède et Lachmann.

Gen.: *Aspidisca* Ehrenberg, 1830

Revision of genus: Wu & Curds (1979).

A. cicada (O. F. Müller, 1786), Animalcula Infusoria, p. 232 (*Trichoda c.*).

SYN: *Coccudina costata* Dujardin, 1841, Zoophytes, p. 446; *Aspidisca sulcata* Kahl, 1932, Tierwelt Dtl., v. 25, p. 645.

MTL: Kahl 1932, p. 645 (*A. costata*) (DL); Hamm, 1964, p. 286 (*A. costata*) (DL); Wu & Curds, 1979, p. 12 (DS); Foissner, 1982b, p. 128 (DS).

REM: Since Kahl (1932) this species has been generally known under the name *Aspidisca costata* (Dujardin). The revision of Wu & Curds (1979) and the eco-morphological study of Hamm (1964) show, however, synonymy with *A. cicada* (Müller) and *A. sulcata* Kahl. Occurs infrequently also in soil (Foissner, 1987c). Sládeček *et al.* (1981) and Wegl (1983) give different saprobic classifications for *A. cicada* (– – 2 8 –) and its synonym *A. sulcata* (– – 8 2 –). In accordance with my experience, I took that of *A. cicada.*

SLA & WEG: *Aspidisca costata* (Duj.) Cl. et L. and *A. sulcata* Kahl.

A. lynceus (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 86 (*Trichoda l.*).

MTL: Kahl, 1932, p. 644 (DL); Wu & Curds, 1979, p. 9 (DS); Foissner, 1982b, p. 128 (DS).

REM: Occurs infrequently also in soil (Foissner, 1987c).

SLA: *Aspidisca lynceus* Ehrenberg.

A. turrita (Ehrenberg, 1831), Abh. dt. Akad. Wiss., year 1831, p. 118 (*Euplotes*? *turritus*).

MTL: Kahl, 1932, p. 644 (DL); Wu & Curds, 1979, p. 11 (DL). – R!

REM: I consider the synonymy with *A. lynceus,* which is supposed by Wu & Curds (1979), to be unlikely, because the dorsal thorn is too prominent. Rare species.

SLA: *Aspidisca turrita* Ehrenberg.

Gen.: *Astylozoon* Engelmann, 1862

Revision of genus: Foissner (1977).

A. fallax Engelmann, 1862, Z. wiss. Zool., v. 11, p. 389.

MTL: Kahl, 1935, p. 665 (DL); Foissner, 1977, p. 358 (DL). – R!

REM: Redescription of silver stained cells pressingly needed. Probably frequently confused with *A. enriquesi* Foissner, 1987.

WEG: *Astylzoon fallax.*

A. faurei Kahl, 1935, Tierwelt Dtl., v. 30, p. 666.

MTL: Foissner, 1977, p. 360 (DL). – R!

WEG: *Astylzoon faurei.*

Gen.: *Blepharisma* Perty, 1849
Revision of genus: Hirshfield *et al.* (1973).
B. coeruleum Gajevskaja, 1927, Dokl. Akad. Nauk SSSR, v. 19, p. 314 (*B. coerulea*).
MTL: Kahl, 1932, p. 444 (DL); Hirshfield *et al.*, 1973, p. 312 (DL). – R!
B. lateritium (Ehrenberg, 1831), Abh. dt. Akad. Wiss., year 1831, p. 110 (*Bursaria lateritia*).
MTL: Kahl, 1932, p. 443 (DL); Hirshfield *et al.*, 1973, p. 311 (DL); Foissner, 1980c, p. 75 (DS); Larsen, 1983, p. 65 (DS).
REM: Hirshfield *et al.* (1973) assign 8 varieties to this species, which were originally described as separate species. At least three out of these eight 'varieties' are good species (Foissner, unpubl.).

Gen.: *Bothrostoma* Stokes, 1887
B. undulans Stokes, 1887, Proc. Am. phil. Soc., v. 24, p. 248.
MTL: Kahl, 1932, p. 407 (*Metopus u.*) (DL); Jankowski, 1964b, p. 207 (DL); Foissner, 1980c, p. 76 (DL). – R!
SLA & WEG: *Metopus undulans* Stokes.

Gen.: *Brachonella* Jankowski, 1964
B. spiralis (Smith, 1897), Trans. Am. microsc. Soc., v. 19, p. 62 (*Metopus s.*).
MTL: Kahl, 1932, p. 423 (*Metopus s.*) (DL); Villeneuve-Brachon 1940, p. 32 (*Metopus s.*) (DS); Jankowski, 1964b, p. 210 (DL); Dragesco & Dragesco-Kernéis, 1986, p. 381 (DS).
REM: This species is listed with the same saprobic classification under the original *and* Jankowski's (1964b) combination in Sládeček *et al.* (1981) and Wegl (1983). The synonymy with *Metopus contortus* is an obvious mistake, because Sládeček *et al.* (1981) and Wegl (1983) also regularly classify *M. contortus* (see there!). Nomenclature see Jankowski (1964b).
SLA & WEG: *Brachonella spiralis* (Smith) Jankowski, syn. *Metopus contortus* and *Metopus spiralis* Smith.

Gen.: *Bursaria* O. F. Müller, 1773
B. truncatella O. F. Müller, 1773, Vermium Terrestrium et Fluviatilium, p. 62.
MTL: Kahl, 1932, p. 476 (DL); Fernández-Galiano, 1979, p. 447 (DS); Foissner, 1980c, p. 95 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 251 (DS).
REM: This large species has been considered for a long time as a typical spirotrichous ciliate. Recent investigations, however, showed its colpodide nature (Fernández-Galiano, 1979; Foissner, 1985c).

Gen.: *Bursaridium* Lauterborn, 1894
B. pseudobursaria (Fauré-Fremiet, 1924), Bull. biol. Fr. Belg., Suppl. 6, p. 139 (*Thylakidium p.*).
MTL: Kahl, 1932, p. 480 (DL). – R!

Gen.: *Bursellopsis* Corliss, 1960
B. spumosa (Schmidt, 1921), Arch. mikrosk. Anat. EntwMech., v. 95, p. 6 (*Bursella s.*).
MTL: Kahl, 1930b, p. 55 (*Bursella s.*) (DL); Dragesco *et al.*, 1974, p. 65 (DS).
REM: Only planktonic. Biometrical characterization of silver stained cells is recommended.

Gen.: *Caenomorpha* Perty, 1852
C. lauterborni Kahl, 1927, Arch. Protistenk., v. 57, p. 182.
MTL: Kahl, 1932, p. 432 (DL); Jankowski, 1964b, p. 246 (DL). – R!
SLA & WEG: *Caenomorpha lauterbornii* Kahl.
C. medusula Perty, 1852, Zur Kenntniss kleinster Lebensformen, p. 140.
MTL: Klein, 1930, p. 301 (DS); Kahl, 1932, p. 430 (DL); Villeneuve-Brachon, 1940, p. 40 (DS); Jankowski, 1964b, p. 235 (DL); Schmall, 1976, p. 31 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 415 (DS).
REM: More detailed investigation of the infraciliature is recommended. This could help to decide the taxonomic status of the varieties which have been described by Kahl (1932). One of these forms, *C. medusula* var. *lata*, has been raised to species rank by Jankowski (1964b).
C. sapropelica Kahl, 1927, Arch. Protistenk., v. 57, p. 179.
MTL: Kahl, 1932, p. 431 (DL); Jankowski, 1964b, p. 241 (DL). – R!
SLA: *Caenomorpha sapropelica* Penard.
C. uniserialis Levander, 1894, Acta Soc. Fauna Flora fenn., v. 9, p. 51.
MTL: Kahl, 1932, p. 433 (DL); Jankowski, 1964b,

p. 244 (DL); Schmall, 1976, p. 29 (DS).
REM: More detailed characterization of silver stained cells is recommended.

Gen.: *Calyptotricha* Phillips, 1882
C. lanuginosa (Penard, 1922), Études Infusoires, p. 182 (*Cyclidium lanuginosum*).
MTL: Kahl, 1931, p. 380 (*Cyclidium l.*) (DL); Wilbert & Foissner, 1980, p. 13 (DS).
REM: The transfer to the genus *Calyptotricha* was caused by the discovery that this species lives in a mucous shell (Wilbert & Foissner, 1980). Wegel (1983) classifies this species with very different saprobic valencies (– 2 6 2 – ; – – – 10 –) under the original *and* Wilbert & Foissner's (1980) combination. In my experience, *C. lanuginosa* is rather strongly bound to the alpha-mesosaprobic zone, but occurs infrequently also under beta-mesosaprobic conditions.
SLA: *Cyclidium lanuginosum* Penard.
WEG: *Calyptotricha lanuginosum* and *Cyclidium lanuginosum.*

Gen.: *Campanella* Goldfuss, 1820
C. umbellaria (Linnaeus, 1758), Systema Naturae, p. 818 (*Hydra u.*).
MTL: Schröder, 1906a, p. 75 (DL); Kahl, 1935, p. 693 (DL); Lom, 1964, p. 141 (DS); Foissner & Schiffmann, 1974, p. 504 (DS).

Gen.: *Carchesium* Ehrenberg, 1830
C. pectinatum (Zacharias, 1897), ForschBer. biol. Stn. Plön, v. 5, p. 7 (*Zoothamnium p.*).
SYN: *Zoothamnium limneticum* Švec, 1897, Bull. int. Acad. tchéque Sci., v. 4, p. 43.
MTL: Kahl, 1935, p. 739 (DL). – R!
REM: In my opinion, there is no doubt about the synonymy proposed by Kahl (1935). This author, however, confused the descriptions of Zacharias (1897) and Švec (1897). Sládeček *et al.* (1981) and Wegel (1983) list both 'species' with different saprobic valencies (– 5 5 – –; – 7 3 – –), although Sládeček *et al.* (1981) declare *Zoothamnium limneticum* as synonym of *Carchesium pectinatum.* Thus, this is an obvious mistake. Exclusively planktonic.
SLA & WEG: *Carchesium limneticum* Švec and *Carchesium pectinatum* Zacharias, syn. *Zoothamnium limneticum* Švec.
C. polypinum (Linnaeus, 1758), Systema Naturae, p. 816 (*Sertularia polypina*).
MTL: Kahl, 1935, p. 738 (DL); Pätsch, 1974, p. 41 (DS); Foissner & Schiffmann, 1974, p. 504 (DS).

Gen.: *Chaenea* Quennerstedt, 1867
C. limicola Lauterborn, 1901, Zool. Anz., v. 24, p. 53.
MTL: Lauterborn, 1908, p. 656 (DL); Kahl, 1930b, p. 106 (DL). – R!
WEG: *Chaena limicola.*
C. teres (Dujardin, 1841), Zoophytes, p. 400 (*Trachelius t.*).
MTL: Kahl, 1930b, p. 106 (DL); Borror, 1963, p. 474 (DL). – R!
REM: It is highly unlikely and needs to be proved by silver staining that this marine species occurs in fresh water. A rather similar but distinct species, *C. torrenticola,* which occurred in a mesosaprobic river, has been described by Foissner (1984b).
SLA: *Chaenea teres* Dujardin.
WEG: *Chaena teres.*
C. vorax Quennerstedt, 1867, Acta Univ. lund., v. 4, p. 15.
MTL: Kahl, 1930, p. 105 (DL); Foissner, 1984a, p. 60 (DS).
REM: Same as *C. teres*! Very probably synonymous with *C. teres.*
WEG: *Chaena vorax.*

Gen.: *Chaetospira* Lachmann, 1856
C. muelleri Lachmann, 1856, Arch. Anat. Physiol., year 1856, p. 364.
MTL: Kahl, 1932, p. 561 (*C. mülleri*) (DL); Froud, 1949, p. 150 (*C. mülleri*) (DL).
C. remex (Hudson, 1875), Am. mon. microsc. J., v. 14, p. 169 (*Archimedea r.*).
MTL: Kahl, 1932, p. 563 (DL). – R!
SLA: *Chaetospira remex* Hudson.

Gen.: *Chilodonella* Strand, 1928
C. uncinata (Ehrenberg, 1838), Infusionsthierchen, p. 337 (*Chilodon uncinatus*).
SYN: *Chilodonella dentata* (Dujardin, 1841), Zoo-

phytes, p. 453 (*Loxodes dentatus*).
MTL: Klein, 1926, p. 249 (DS); Kahl, 1931, p. 240 (DL); Foissner, 1974, pp. 29–31 (DS); Pätsch, 1974, p. 23 (*C. dentata*) (DS); Foissner, 1979b, p. 124 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 277 (DS); Foissner, 1987b (DS).
REM: I consider *Chilodonella dentata* as synonym, because all populations (about 20) of *C. uncinata,* which I have impregnated with protargol silver, possess a cornucopia-like cyrtos. This special character is, however, very difficult to recognize *in vivo;* therefore, it is understandable that Ehrenberg (1838) overlooked it. Kahl (1931) wrongly gives Fouquet (1876) as describer of *C. dentata.* Sládeček *et al.* (1981) and Wegl (1983) give different saprobic classifications for *C. uncinata* (– – – 10 –) and *C. dentata* (– – 3 7 –).
SLA & WEG: *Chilodonella uncinata* Ehrenberg and *Chilodonella dentata* Fouque.

Gen.: *Chilodontopsis* Blochmann, 1895
C. depressa (Perty, 1852), Zur Kenntniss kleinster Lebensformen, p. 146 (*Chilodon depressus*).
MTL: Kahl, 1931, p. 225 (DL); Foissner, 1979c, p. 423 (DS).
REM: Redescription of protargol silver stained cells is recommended. Both species (*C. depressa* and *C. vorax*) are easily mixed up with *Trithigmostoma* spp.
SLA: *Chilodontopsis depressa* Perty.
C. muscorum Kahl, 1931, Tierwelt Dtl., v. 21, p. 227.
MTL: Foissner, 1984a, p. 98 (DS).
REM: In my experience, this species is restricted to terrestrial habitats (Foissner, 1987c).
C. vorax (Stokes, 1887), Ann. Mag. nat. Hist., v. 20, p. 105 (*Chilodon v.*).
MTL: Kahl, 1931, p. 225 (DL). – R!
SLA: *Chilodontopsis vorax* Stokes.

Gen.: *Cinetochilum* Perty, 1852
C. margaritaceum (Ehrenberg, 1831), Abh. dt. Akad. Wiss., year 1831, p. 74 (*Cyclidium m.*).
MTL: Kahl, 1931, p. 351 (DL); Jankowski, 1968, p. 187 (DS); Pätsch, 1974, p. 32 (DS); Puytorac *et al.,* 1974, p. 223 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 353 (DS).
REM: As a result of Kahl's (1931) wrong citation, Perty (1852) is frequently cited as describer. It is however, first mentioned in Ehrenberg 1830, Abh. dt. Akad. Wiss., p. 62 and is correctly diagnosed in Ehrenberg (1831). Occurs also in soil (Foissner, 1987c).
SLA: *Cinetochilum margaritaceum* Perty.
WEG: *Cintochilum margaritaceum.*

Gen.: *Climacostomum* Stein, 1859
C. virens (Ehrenberg, 1838), Infusionsthierchen, p. 332 (*Spirostomum v.*).
MTL: Kahl, 1932, p. 459 (DL); Repak, 1972, p. 417 (DS); Peck *et al.,* 1975, p. 368 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 401 (DS).
REM: Nomenclature see Foissner (1987a). The older name, *C. spirigera,* has been suggested as a *nomen oblitum.* This species is easily confused with *C. minimum* Foissner, 1980, which is smaller and has a shorter macronucleus.
SLA: *Climacostomum virens* Ehrenberg.

Gen.: *Codonella* Haeckel, 1873
Revision of the limnetic species: Foissner & Wilbert (1979).
C. cratera (Leidy, 1877), Proc. Acad. nat. Sci. Philad., year 1877, p. 307 (*Difflugia c.*).
SYN: *Codonella lacustris* Entz, 1885, Mitt. zool. Stn. Neapel, v. 6, p. 196.
MTL: Kofoid & Campbell, 1929, p. 58 (DL); Kahl, 1932, p. 517 (DL); Foissner & Wilbert, 1979, p. 97, 100 (DS); Bernatzky *et al.,* 1981, p. 82.
REM: Several varieties of this species are mentioned in Kahl (1932). They are very likely only ecoforms or immature shells (Foissner & Wilbert, 1979; Bernatzky *et al.,* 1981). Only planktonic; mass developments in hypereutrophic lakes and ponds. Saprobic valencies differently assessed by Sládeček *et al.* (1981) and Wegl (1983) (– 6 4 – –; – 4 6 – –).
SLA & WEG: *Codonella cratera* (Leidy) = *Tintinnopsis lacustris* (Entz sen.) and *Tintinnopsis lacustris* (Entz sen.), syn. = *Codonella lacustris* Leidy.

Gen.: *Cohnilembus* Kahl, 1933
C. verminus (O. F. Müller, 1786), Animalcula Infusoria, p. 57 (*Vibrio v.*).

MTL: Kahl, 1931, p. 369 (*Lembus v.*) (DL); Thompson, 1968, p. 396 (DS).
REM: Certainly restricted to marine habitats. Very likely mixed up with *Kahlilembus* spp.
SLA & WEG: *Cohnilembus varminus* (O. F. Müller).
C. vexillarius (Kahl, 1926), Arch. Protistenk., v. 55, p. 360 (*Lembus v.*).
MTL: Kahl, 1931, p. 373 (*Lembus v.*) (DL). – R!
REM: Rather likely, reinvestigation of silver stained material will assign this species to the genus *Kahlilembus.*
SLA & WEG: *Lembus vexillarius* Kahl.

Gen.: *Coleps* Nitzsch, 1827
Revision of genus: Noland (1925), Chardez (1976).
C. bicuspis Noland, 1925, Trans. Am. microsc. Soc., v. 44, p. 5.
MTL: Kahl 1930b, p. 135 (DL). – R!
REM: Saprobic valencies differently assessed by Sládeček *et al.* (1981) and Wegl (1983) (– – 7 3 –; – – 6 4 –).
C. hirtus (O. F. Müller, 1786), Animalcula Infusoria, p. 128 (*Cercaria hirta*).
MTL: Kahl 1930b, p. 134 (DL); Foissner 1984a, p. 22 (DS).
REM: Frequently wrongly cited as '*Coleps hirtus* Nitzsch, 1817' (see Foissner 1987a).
SLA: *Coleps hirtus* Nitzsch.

Gen.: *Colpidium* Stein, 1860
Revision of genus: Foissner & Schiffmann (1980), Foissner (1982a). Members of this genus are common in polluted waters, but do not occur in ephemeric habitats and in soil, because they are unable to make cysts (Foissner, 1987c).
C. campylum (Stokes, 1886), Ann. Mag. nat. Hist., v. 17, p. 101 (*Tillina campyla*).
MTL: Kahl, 1931b, p. 334 (DL); Foissner & Schiffmann, 1980, p. 29 (DS); Foissner, 1982a, p. 107 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 289 (DS).
WEG: *Colpidium campilum.*
C. colpoda (Losana, 1829), Memorie Accad. Sci. Torino, v. 29, p. 45 (*Paramaecia kolpoda*).
MTL: Kahl, 1931, p. 334 (DL); Foissner & Schiffmann, 1980, p. 29 (DS).
REM: Some populations are easily confused with *Colpidium truncatum.* The authorship of this species is frequently attributed to Ehrenberg (1831), but Losana (1829) has been established as describer by the International Commission of Zoological Nomenclature (Corliss & Dougherty 1967).
C. kleini Foissner, 1969 Acta Protozool., v. 7, p. 17.
MTL: McCoy 1974b, p. 161 (BS); Foissner & Schiffmann, 1980, p. 29 (DS); Foissner, 1982a, p. 107 (DS).
C. truncatum Stokes, 1885, Ann. Mag. nat. Hist., v. 15, p. 443.
MTL: Foissner & Schiffman, 1980, p. 28 (DS); Foissner, 1982a, p. 107 (DS).

Gen.: *Colpoda* O. F. Müller, 1773
Members of this genus are typical for soil habitats. Occurrence in fresh-water rare or indicates edaphic influences (e.g. mosses).
C. cucullus (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 58 (*Kolpoda c.*).
MTL: Kahl, 1931, p. 277 (DL); Foissner, 1980a, p. 241 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 241 (DS).
REM: Very variable in size and shape; most likely a complex of sibling species.
WEG: *Colpoda cucullulus.*
C. inflata (Stokes, 1885), Ann. Mag. nat. Hist., v. 15, p. 441 (*Tillina i.*).
MTL: Kahl, 1931, p. 280 (DL); Foissner, 1980a, p. 419 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 243 (DS).
SLA: *Colpoda inflata* Stokes.

Gen.: *Condylostoma* Bory de St. Vincent, 1826
C. vorticella (Ehrenberg, 1833), Abh. dt. Akad. Wiss., year 1833, p. 237 (*Bursaria v.*).
MTL: Kahl, 1932, p. 457 (DL); Pätsch 1974, p. 48 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 391 (DS). – R!
REM: Reinvestigation necessary, because neither Pätsch (1974) nor Dragesco & Dragesco-Kernéis, (1986) describe oral cirri, which are characteristic of the marine species of this genus (Wilbert & Kahan 1981). If they are really absent, *C. vorticella* would need a genus of its own.

Gen.: *Cothurnia* Ehrenberg, 1831
C. annulata Stokes, 1885, Am. J. Sci., v. 29, p. 322.
MTL: Kahl, 1935, p. 779 (DL). – R!
REM: Revision of the genus is pressingly needed.

Gen.: *Cristigera* Roux, 1899
C. media Kahl, 1928, Arch. Hydrobiol., v. 19, p. 117.
MTL: Kahl, 1931, p. 385 (DL); Wilbert, 1986, p. 390 (DS).

Gen.: *Ctedoctema* Stokes, 1884
C. acanthocrypta Stokes, 1884, Am. Nat., v. 18, p. 659.
MTL: Kahl 1931, p. 386 (DL); Wilbert & Buitkamp, 1973, p. 208 (DS).
REM: Small & Lynn (1985, p. 538) consider the species described by Wilbert & Buitkamp (1973) as a new one, *C. wilberti.* This is a wrong decision, because I know from repeated observations that the postoral bubble of the type species is certainly an artifact. This bubble occurs at the site of the cytopyge and is frequently a sign that the cells are dying.
SLA & WEG: *Ctedocnema acanthocrypta* Stokes.

Gen.: *Cyclidium* O. F. Müller, 1773
C. citrullus (Cohn, 1866), Z. wiss. Zool., v. 16, p. 276 (*Pleuronema c.*).
MTL: Kahl, 1931, p. 376 (DL); Grolière, 1973, p. 374 (DS); Agamaliev, 1983, p. 98 (DS). – R!
REM: *In vivo* easily mixed up with *C. glaucoma.* After silver impregnation separable from this species by means of the structure of the adoral membranelles. However, this must be checked again, because the descriptions of Grolière (1973) and Agamaliev (1983) completely disagree in this respect.
SLA: *Cyclidium citrullus* Cohn.
C. elongatum (Schewiakoff, 1889), Bibl. zool., v. 5, p. 62 (*Cyclidium glaucoma* var. *elongatum*).
MTL: Kahl, 1931, p. 376 (DL). – R!
REM: In my opinion, this species should be synonymized with *C. glaucoma.*
SLA: *Cyclidium elongatum* Schewiakoff.
C. glaucoma O. F. Müller, 1773, Vermium Terrestrium et Fluviatilium, p. 51.
MTL: Kahl, 1931, p. 376 (DL); Didier & Wilbert, 1981, p. 96 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 361 (DS).
REM: Common in all types of waters, rare or absent in soil, where *C. muscicola* and *C. terricola* are common (Foissner, 1987c, Foissner & Foissner, 1987).
C. heptatrichum Schewiakoff, 1893, Zap. imp. Akad. Nauk SSSR, v. 41, p. 54.
MTL: Kahl, 1932, p. 381 (DL). – R!
REM: Saprobic valencies differently assessed by Sládeček *et al.* (1981) and Wegl (1983) (– – 10 – –; – – 8 2 –).
C. oblongum Kahl, 1931, Tierwelt Dtl., v. 21, p. 378.
MTL: None. – R!
REM: If Kahl's (1931) observation that the mouth is surrounded on both sides by an undulating membrane is correct, then this species would need a genus of its own. It probably belongs to the genus *Schizocalyptra* Dragesco, 1968, whose oral structures produce *in vivo* a similar impression.
C. singulare (Kahl, 1926), Arch. Protistenk., v. 55, p. 330 (*Loxocephalus singularis*).
MTL: Kahl, 1931, p. 378 (DL). – R!
SLA: *Cyclidium singulare* Kahl.
C. versatile Penard, 1922, Études Infusoires, p. 183.
MTL: Kahl, 1931, p. 380 (DL). – R!

Gen.: *Cyrtolophosis* Stokes, 1885
C. mucicola Stokes, 1885, Am. Nat., v. 19, p. 440.
MTL: Kahl, 1931, p. 354 (DL); McCoy 1974a, p. 41 (DS); Foissner, 1978c, p. 217 (DS); Didier *et al.,* 1980, p. 72 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 235 (DS).
REM: Sládeček *et al.* (1981) and Wegl (1983) restrict this species to the polysaprobic zone. We found, however, mass development under alpha-mesosaprobic conditions and in soil (Foissner, 1987c). In fact, this species is probably eurysaprobic (Foissner *et al.* 1982a). Thus, I changed the saprobic valencies to (– – – 5 5).

Gen.: *Dendrosoma* Ehrenberg, 1838
D. radians Ehrenberg, 1838, Infusionsthierchen, p. 316.
MTL: Collin, 1912, p. 384 (DL); Gönnert, 1935, p. 124 (DL); Oppenheim, 1976, p. 12 (DL); Matthes & Rebhan, 1983, p. 230 (DL).

Gen.: *Dexiotricha* Stokes, 1885

D. plagia Stokes, 1885, Am. J. Sci., v. 29, p. 327.

MTL: Kahl, 1931, p. 343 (*Loxocephalus plagius*) (DL); Jankowski, 1964a, p. 43 (DS); Wilbert, 1986, p. 384 (DS).

SLA & WEG: *Loxocephalus plagius* (Stokes).

Gen.: *Dexiotrichides* Kahl, 1931

D. centralis (Stokes, 1885), Am. mon. microsc. J., v. 6, p. 184 (*Dexiotricha c.*).

MTL: Kahl, 1931, p. 351 (DL); Schmall, 1976, p. 22 (DS).

Gen.: *Didinium* Stein, 1859

D. cinctum Voigt, 1902, ForschBer. biol. Stn. Plön, v. 9, p. 35.

MTL: Kahl, 1930b, p. 123 (DL). – R!

REM: The reinvestigation of silver stained cells will very likely show that this species needs a genus of its own. Jankowski (1980) has indeed, but without any new data, established the genus *Pelagovasicola* for it. Curds (1982) assigns this species to *Dinophrya* Bütschli, 1889. This is wrong, because *Dinophrya* is certainly a synonym of *Acropisthium* Perty, 1852. Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 10 – – –; – 8 2 – –).

D. nasutum (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 102 (*Vorticella nasuta*).

MTL: Kahl, 1930b, p. 125 (DL); Foissner, 1984a, p. 44 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 172 (DS).

REM: Voracious ciliate-eater, which however does not reject algae etc. Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 2 5 3 –; – 2 4 4 –).

SLA: *Didinium nasutum* O. F. Müller.

Gen.: *Dileptus* Dujardin, 1840

Revision of genus: Dragesco (1963).

D. conspicuus Kahl, 1931, Tierwelt Dtl., v. 21, p. 209.

MTL: Dragesco, 1963, p. 119 (DL). – R!

D. gigas (Claparède & Lachmann, 1859), Mém. Inst. natn. génev., v. 6, p. 349 (*Amphileptus g.*).

MTL: Kahl, 1931, p. 207 (DL); Dragesco, 1963, p. 114 (DL). – R!

D. margaritifer (Ehrenberg, 1833), Abh. dt. Akad. Wiss., year 1833, p. 230 (*Amphileptus m.*).

SYN: *Dileptus anser* of Kahl 1931, p. 205 and of many other authors.

MTL: Kahl, 1931, p. 205 (*D. anser*) (DL); Dragesco, 1963, p. 104 (*D. anser*) (DL); Golińska, 1971, p. 367 (*D. anser*) (DS); Dragesco & Dragesco-Kernéis, 1986, p. 161 (*D. anser*) (DS).

REM: Detailed nomenclatural discussion see Wirnsberger *et al.* (1984). *Dileptus* (*Vibrio*) *anser* (O. F. Müller, 1773) is that species which, since Kahl (1931, p. 205), has been generally named *Dileptus* (*Amphileptus*) *cygnus* (Claparède & Lachmann, 1859). Thus, the species of Claparède & Lachmann (1959) is a junior synonym of the species of Müller (1773). This causes the validation of the name *Dileptus* (*Amphileptus*) *margaritifer* (Ehrenberg, 1833), which is treated as synonym of *Dileptus anser* (O. F. Müller, 1773) by Kahl and others. Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 4 6 – –; – 3 7 – –).

SLA & WEG: *Dileptus anser* O. F. Müller.

D. monilatus (Stokes, 1886), Ann. Mag. nat. Hist., v. 17, p. 102 (*Amphileptus m.*).

MTL: Kahl, 1931, p. 205 (DL); Dragesco 1963, p. 109 (DL). – R!

Gen.: *Discomorphella* Corliss, 1960

D. lauterborni (Wetzel, 1928), Z. Morph. Ökol. Tiere, v. 13, p. 255 (*Discomorpha l.*).

MTL: Kahl, 1932, p. 532 (*Discomorpha pectinata* var. *lauterborni*) (DL). – R!

REM: Kahl (1932) considers this species as a variety of *Discomorphella pectinata.* Jankowski (1964b) synonymizes it with *D. pectinata* without giving any reason.

SLA & WEG: *Discomorpha lauterbornii* Wetzel.

D. pectinata (Levander, 1894), Acta Soc. Fauna Flora fenn., v. 9, p. 55 (*Discomorpha p.*).

MTL: Klein, 1930, p. 306 (*Discomorpha p.*) (DS); Kahl, 1932, p. 531 (*Discomorpha p.*) (DL); Jankowski, 1964b, p. 261 (DL). – R!

REM: Redescription and detailed biometric characterization of silver stained cells recommended. This could clarify the supposed synonymy with the above mentioned species.

SLA & WEG: *Discomorpha pectinata* Levander.

Gen.: *Disematostoma* Lauterborn, 1894
D. buetschlii Lauterborn, 1894, Biol. Zbl., v. 14, p. 397 (*D. Bütschlii*).
MTL: Kahl, 1931, p. 323 (*D. bütschlii*) (DL); non Dragesco, 1970, p. 57 (see Dragesco & Dragesco-Kernéis, 1986, p. 315!). – R!
D. tetraedricum (Fauré-Fremiet, 1924), Bull. biol. Fr. Belg., Suppl. 6, p. 128 (*Leucophrys tetraedrica*).
MTL: Kahl, 1931, p. 323 and Kahl, 1935, p. 833 (DL); Roque, 1961 p. 460 (DS).
REM: The combination of Kahl (1931) has been confirmed by Roque (1961). *Stokesia,* the combination which Kahl (1935) later suggested, has a differently structured adoral membranelle 3 (Roque, 1961, Dragesco, 1966). Jankowski (1967a) established with the vague characters 'body shape, large mouth' the genus *Parastokesia* for this species. In my opinion, this genus is unnecessary, because the shape of the body and the structure of the oral and somatic infraciliature (pronounced dorsal suture!) are very similar in *D. buetschlii* and *D. tetraedricum* (Roque, 1961). Only planktonic.
SLA & WEG: *Disematostoma tetraedrica* Fauré-Fremiet.

Gen.: *Drepanomonas* Fresenius, 1858
D. dentata Fresenius, 1858, Abh. senckenb. naturforsch. Ges., v. 2, p. 216.
MTL: Kahl, 1931, p. 304 (DL); Prelle, 1968, p. 517 (DS). – R!
REM: Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 10 – – –; – 8 2 – –).
D. revoluta Penard, 1922, Études Infusoires, p. 169.
MTL: Kahl, 1931, p. 305 (DL); Buitkamp, 1977, p. 258 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 274 (DS); Foissner, 1987d (DS).
REM: Common in terrestrial habitats (Foissner, 1987c). It should be checked whether the limnetic and the terrestrial forms really belong to the same species. The saprobic classification of Sládeček *et al.* (1981) and Wegl (1983) is doubtful in my opinion.
SLA: *Drepanomonas revoluta* Müller.

Gen.: *Dysteria* Huxley, 1857
D. fluviatilis (Stein, 1859), Organismus der Infusionsthiere I, p. 120 (*Ervilia f.*).
MTL: Kahl, 1931, p. 256 (DL). – R!
SLA: *Dysteria fluviatilis* Stein.

Gen.: *Enchelyodon* Claparède & Lachmann, 1859
E. elegans (Kahl, 1926), Arch. Protistenk., v. 55, p. 270 (*Sphathidium e.*).
MTL: Kahl, 1930b, p. 111 (DL). – R!
SLA: *Enchelyodon elegans* Kahl.
E. fusidens Kahl, 1930, Tierwelt Dtl., v. 18, p. 113.
MTL: None. – R!

Gen.: *Enchelyomorpha* Kahl, 1930
E. vermicularis (Smith, 1899), Trans. Am. microsc. Soc., v. 20, p. 52 (*Enchelys v.*).
MTL: Kahl, 1930b, p. 140 (DL); Liebmann, 1936, p. 563 (DL). – R!
REM: Interesting taxonomic results can be expected from a reinvestigation of this extraordinary ciliate, which occurs also in trickling filters (Liebmann, 1936).
SLA: *Enchelyomorpha vermicularis* Smith, syn. *Enchelys vermicularis.*
WEG: *Enchelyodon vermicularis.*

Gen.: *Enchelys* O. F. Müller, 1773
E. gasterosteus Kahl, 1926, Arch. Protistenk., v. 55, p. 261.
MTL: Kahl, 1930b, p. 96 (DL); Foissner, 1984a, p. 35 (DS).
E. pupa (O. F. Müller, 1786), Animalcula Infusoria, p. 42 (*Enchelis p.*).
MTL: Kahl, 1930b, p. 98 (DL). – R!
SLA: *Enchelys pupa* O. F. Müller.

Gen.: *Epalxella* Corliss, 1960
E. antiquorum (Penard, 1922), Études Infusoires, p. 160 (*Epalxis a.*).
MTL: Klein, 1930, p. 316 (*Epalxis a.*) (DS); Kahl, 1932, p. 523 (*Epalxis a.*) (DL); Jankowski, 1964b, p. 252 (DL). – R!
REM: Redescription of protargol silver stained cells necessary.
SLA: *Epalxella antiquorum* Penard.
E. bidens (Kahl, 1932), Tierwelt Dtl., v. 25, p. 523 (*Epalxis b.*).

MTL: None. – R!
SLA: *Epalxella bidens* Kahl.
E. mirabilis (Roux, 1899), Rev. suisse Zool., v. 6, p. 596 (*Epalxis m.*).
MTL: Kahl, 1932, p. 523 (*Epalxis m.*) (DL). – R!
SLA: *Epalxella mirabilis* Roux.
E. striata (Kahl, 1926), Arch. Protistenk., v. 55, p. 407 (*Epalxis s.*).
MTL: Kahl, 1932, p. 525 (*Epalxis s.*) (DL); Jankowski, 1964b, p. 256 (DL). – R!

Gen.: *Epenardia* Corliss, 1971
E. myriophylli (Penard, 1922), Études Infusoires, p. 124 (*Glaucoma m.*).
MTL: Kahl, 1931, p. 329 (*Glaucoma m.*) (DL); Corliss, 1971, p. 354 (DS); Fernández-Galiano *et al.*, 1985, p. 145 (DS).
SLA & WEG: *Glaucoma myriophylli* Penard.

Gen.: *Epistylis* Ehrenberg, 1830
E. coronata Nusch, 1970, Arch. Hydrobiol., Suppl. 30, p. 304.
MTL: None. – R!
E. digitalis (Linneaus, 1758), Systema Naturae, p. 818 (*Hydra d.*).
MTL: Kahl, 1935, p. 689 (DL). – R!
REM: Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 5 5 – –; – 3 7 – –).
SLA: *Epistylis digitalis* Ehrenberg.
E. galea Ehrenberg, 1831, Abh. dt. Akad. Wiss., year 1831, p. 97.
MTL: Kahl, 1935, p. 691 (DL); Matthes & Scheubel 1970, p. 30 (DL). – R!
REM: Interesting morphological and ecological data in Matthes & Scheubel (1970). However, redescription of silver stained cells is necessary.
E. hentscheli Kahl, 1935, Tierwelt Dtl., v. 30, p. 690.
MTL: None. – R!
E. nympharum Engelmann, 1862, Z. wiss. Zool., v. 11, p. 390.
MTL: Kahl, 1935, p. 682 (DL); Foissner & Schiffmann, 1975, p. 419 (DS).
REM: Redescription of protargol silver stained cells is recommended.
E. plicatilis Ehrenberg, 1831, Abh. dt. Akad. Wiss., year 1831, p. 96.
MTL: Schröder, 1906b, p. 173 (DL); Kahl, 1935, p. 690 (DL); Foissner & Schiffmann, 1974, p. 505 (DS); Foissner, 1979a, p. 545 (DL).
REM: Same as in *E. nympharum*!
E. rotans Švec, 1897, Bull. int. Acad. tchéque Sci., v. 4, p. 44.
MTL: Kahl, 1935, p. 689 (DL). – R!
REM: Kahl (1935) suggests synonymy with *E. procumbens* Zacharias, 1897, ForschBer. biol. Stn. Plön, v. 5, p. 7. This should be checked because there are rather pronounced differences in the shape of the extended and contracted zooids in the original descriptions.

Gen.: *Euplotes* Ehrenberg, 1831
Revision of genus: Tuffrau (1960), Curds (1975).
E. aediculatus Pierson, 1943, J. Morph., v. 72, p. 138.
MTL: Pierson *et al.*, 1968, p. 306 (DS); Curds, 1975, p. 17 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 502 (DS).
REM: Easily mixed up with *E. eurystomus*!
E. affinis (Dujardin, 1841), Zoophytes, p. 441 (*Ploesconia a.*).
MTL: Kahl, 1932, p. 637 (DL); Curds, 1974, p. 117 (DS); Pätsch, 1974, p. 52 (DS); Curds, 1975, p. 18 (DS); Foissner, 1980c, p. 111 (DS).
REM: The synonymy with *E. charon,* suggested by Tuffrau (1960) and Sládeček *et al.* (1981), is rejected by Curds (1975).
SLA: *Euplotes affinis* Dujardin.
E. charon (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 83 (*Trichoda c.*).
MTL: Kahl, 1932, p. 633 (DL); Curds, 1975, p. 24 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 508 (DS).
REM: see *E. affinis*!
SLA: *Euplotes affinis* Dujardin, syn. *E. charon* (O. F. M.) Stein.
E. eurystomus (Wrześniowski, 1870), Z. wiss. Zool., v. 20, p. 483. (*E. patella* var. *eurystomus*).
MTL: Kahl, 1932, p. 640 (DL); Curds, 1975, p. 26 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 501 (DS).
REM: Easily confused with *E. aediculatus* and *E. patella.*
SLA: *Euplotes eurystomus* Wrzesn.

E. moebiusi Kahl, 1932, Tierwelt Dtl., v. 25, p. 634 (inclusive the variety '*quadricirratus*').
MTL: Curds, 1974, p. 115 (DS); Curds, 1975, p. 49 (DS); Foissner, 1978b, p. 89 (DS). – R!
REM: The descriptions of Curds (1974, 1975) and Foissner (1978b) are rather different.
SLA: *Euplotes moebiusi* f. *quadricirratus* Kahl.
E. patella (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 95 (*Trichoda p.*).
SYN: *Euplotes carinatus* Stokes, 1885, Am. Nat., v. 19, p. 441.
MTL: Kahl, 1932, p. 639 (DL); Pierson, 1943, p. 125 (DL); Curds, 1975, p. 41 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 499 (DS).
REM: *Euplotes carinatus* is considered as synonym of *E. patella* by Tuffrau (1960) and Curds (1975). In fact, the drawing of Stokes (1885a) suggests that he studied more or less damaged individuals. This could also explain the differences in the saprobic classification. *Euplotes patella* in Sládeček *et al.* (1981): – – 7 3 –, in Wegl (1983): – – 8 2 –. *Euplotes carinatus* in Sládeček *et al.* (1981) and Wegl (1983): – – 2 4 4.
SLA & WEG: *Euplotes patella* (O. F. M.) Ehrenberg and *E. carinatus* Stokes.

Gen.: *Frontonia* Ehrenberg, 1838
F. acuminata (Ehrenberg, 1833), Abh. dt. Akad. Wiss., year 1833, p. 268 (*Ophryoglena a.*).
MTL: Kahl, 1931, p. 320 (DL); Gil & Pérez-Silva, 1964b, p. 71 (DS).
REM: Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 2 6 2 –; – – 6 4 –).
SLA: *Frontonia acuminata* (Claparède et Lachmann) Ehrbg.
F. atra (Ehrenberg, 1833), Abh. dt. Akad. Wiss., year 1833, p. 265 (*Ophryoglena a.*).
MTL: Kahl, 1931, p. 321 (DL); Dragesco & Dragesco-Kernéis, 1986, p. 323 (DS).
SLA: *Frontonia atra* Ehrenberg.
F. leucas (Ehrenberg, 1833), Abh. dt. Akad. Wiss, year 1833, p. 233 (*Bursaria l.*).
MTL: Kahl, 1931, p. 317 (DL); Gil & Pérez-Silva, 1964a, p. 239 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 318 (DS).
SLA: *Frontonia leucas* Ehrenberg.

F. vesiculosa Da Cunha, 1913, Mems. Inst. Oswaldo Cruz, v. 5, p. 114.
MTL: Kahl, 1931, p. 322 (DL); Dragesco, 1970, p. 47 (DS).

Gen.: *Gastronauta* Bütschli, 1889
G. membranacea Bütschli, 1889, Protozoa, p. 1696.
MTL: Klein, 1927, p. 110 (DS); Kahl, 1931, p. 233 (*G. membranaceus*) (DL); Deroux & Dragesco, 1968, p. 392 (DS).
REM: Characteristic member of the Aufwuchs community. Nomenclature see Foissner (1987a).
WEG: *Gastronauta membranaceus.*

Gen.: *Gastrostyla* Engelmann, 1862
G. steinii Engelmann, 1862, Z. wiss. Zool., v. 11, p. 383.
MTL: Kahl, 1932, p. 595 (*G. steini*) (DL); Foissner, 1982b, p. 71 (DS).
REM: Very common in terrestrial habitats (Foissner, 1987c).

Gen.: *Glaucoma* Ehrenberg, 1830
Revision (pro parte) of genus: Corliss (1971).
G. reniforme Schewiakoff, 1892, Verh. naturh.-med. Ver. Heidelberg, v. 4, p. 555 (*G. reniformis*).
SYN: *Glaucoma chattoni* Corliss, 1959, J. Protozool., v. 6, Suppl. 24.
MTL: Kahl, 1931, p. 330 (*G. reniformis*) (DL); Corliss, 1971, p. 350 (*G. chattoni*) (DS); McCoy, 1975, p. 149 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 299 (*G. chattoni*).
REM: Synonymy after McCoy (1975). *In vivo* easily confused with *G. scintillans.*
SLA & WEG: *Glaucoma chattoni* Corliss.
G. scintillans Ehrenberg, 1830, Abh. dt. Akad. Wiss., year 1830, p. 53, 78.
MTL: Klein, 1926, p. 260 (DS); Kahl, 1931, p. 329 (DL); Dragesco, 1970, p. 37 (DS); Corliss, 1971, p. 348 (DS); Foissner, 1974, p. 44 (DS); Pätsch, 1974, p. 29 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 297 (DS).
REM: Probably a complex of sibling species (Mc Coy 1975).

Gen.: *Halteria* Dujardin, 1841
Revision of genus: Dragesco & Dragesco-Kernéis (1986).

H. chlorelligera (Kahl, 1932), Tierwelt Dtl., v. 25, p. 505 (*Halteria grandinella* var. *chlorelligera*).
MTL: None. – R!
REM: Kahl (1935) later raised this variety to species rank. Rare. Sládeček *et al.* (1981) and Wegel (1983) give different saprobic valencies (– 10 – – –; – 8 2 – –).
SLA: *Halteria chlorelligera* Kahl.
H. cirrifera (Kahl, 1932), Tierwelt Dtl., v. 25, p. 505 (*Halteria grandinella* var. *cirrifera*).
MTL: Dragesco & Dragesco-Kernéis, 1986, p. 420 (DL). – R!
REM: Kahl (1935) later raised this variety to species rank. Rare. Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 7 3 – –; – 6 4 – –).
H. grandinella (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 77 (*Trichoda g.*).
MTL: Kahl, 1932, p. 504 (DL); Schmall, 1976, p. 35 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 417 (DS); Foissner, 1987c (DS).
REM: Common in all types of water and in soil (Foissner, 1987c). Szabó (1935) split this species, but this has been not accepted by other workers, with the exception of Dragesco & Dragesco-Kernéis (1986). Detailed investigations about the variability of this species are necessary.
SLA: *Halteria grandinella* O. F. Müller.

Gen.: *Hastatella* Erlanger, 1890
Revision of genus: Foissner (1977).
H. radians Erlanger, 1890, Z. wiss. Zool., v. 49, p. 657.
MTL: Kahl, 1935, p. 667 (DL); Foissner, 1977, p. 363 (DS).
REM: Planktonic; rare. Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 2 7 1 –; – 1 6 3 –).

Gen.: *Heliophrya* De Saedeleer & Tellier, 1930
Revision of genus: Matthes (1954b), Jankowski (1981).
H. minima (Rieder, 1936), Rev. suisse Zool., v. 43, p. 383 (*Craspedophrya rotunda* var. *minima*).
SYN: *Heliophrya riederi* Matthes, 1954, Arch. Protistenk., v. 100, p. 149.
MTL: None. – R!
REM: Jankowski (1981) correctly states that this species must be named *H. minima,* because Matthes (1954b) only raised the variety described by Rieder (1936) to species rank. Jankowski (1981), however, unnecessarily established the new genus *Paraheliophrya* for this species.
WEG: *Heliophrya riederi.*
H. rotunda (Hentschel, 1916), Mitt. zool. Mus. Hamburg, v. 33, p. 22 (*Trichophrya r.*).
MTL: Matthes, 1954b, p. 145 (DL). – R!

Gen.: *Hexotricha* Conn & Edmondson, 1918
H. caudata Lackey, 1925, New Jers. Agric. Exp. Stn. Bull., no. 417, p. 32.
MTL: Liebmann, 1936, p. 558 (DL). – R!
REM: The systematic position of this strange genus is very unclear. Thus, one may expect interesting taxonomic results from the reinvestigation of silver impregnated cells.

Gen.: *Histriculus* Corliss, 1960
H. similis (Quennerstedt, 1867), Acta Univ. lund., v. 4, p. 38 (*Stylonychia s.*).
MTL: Kahl, 1932, p. 615 (*Histrio s.*). – R!
REM: Quennerstedt (1867) describes this species with two macronuclear segments. Later, Kahl (1932) furnished it with four segments. This cannot be accepted. Thus, the taxonomy of this species, which was originally described from a marine habitat, remains unclear. I frequently find *Histriculus muscorum* (Kahl, 1932; redescribed by Berger *et al.* 1985) in running and stagnant waters, in activated sludge, and in soil. This species is not mentioned in Sládeček *et al.* (1981) and Wegl (1983).
SLA: *Histriculus similis* Corliss.
H. vorax (Stokes, 1891), Jl. R. Microsc. Soc., year 1891, p. 703 (*Histrio v.*).
MTL: Kahl, 1932, p. 617 (*Histrio v.*) (DL). – R!
REM: Likewise a very doubtful species, which should be listed in faunal lists only after it has been confirmed by silver impregnation.
SLA: *Histriculus vorax* Corliss.

Gen.: *Holophrya* Ehrenberg, 1833
H. nigricans Lauterborn, 1894, Biol. Zbl., v. 14, p. 396.

MTL: Lauterborn, 1908, p. 651 (DL); Kahl, 1930b, p. 52 (DL). – R!

REM: Discrimination of the often confused genera *Holophrya* (without brush) and *Prorodon* (with 3 longitudinally orientated brush kineties, which consist of paired basal bodies) *in vivo* rather difficult. Detailed discussion see Foissner (1984a).

Gen.: *Holosticha* Wrześniowski, 1877

Revision of genus: Borror & Wicklow (1983).

H. kessleri (Wrześniowski, 1877), Z. wiss. Zool., v. 29, p. 275 (*Oxytricha Kessleri*).

MTL: Kahl, 1932, p. 581 (DL). – R!

H. mystacea (Stein, 1859), Organismus der Infusionsthiere I, p. 188 (*Oxytricha m.*).

MTL: Kahl, 1932, p. 585 (DL). – R!

SLA: *Holosticha mystacea* Stein.

H. similis Stokes, 1886, Proc. Am. phil Soc., v. 23, p. 26.

SYN: *Holosticha monilata* Kahl, 1928, Arch. Hydrobiol., v. 19, p. 212; *Keronopsis monilata* Kahl, 1932, Tierwelt Dtl., v. 25, p. 577.

MTL: Kahl, 1932, p. 577 (*Keronopsis s.*) (DL); Dragesco 1970, p. 107 (*Keronopsis m.*) (DS); Grolière, 1975b, p. 484 (*Keronopsis m.*) (DS); Foissner & Didier, 1981, p. 260 (DS).

REM: Discussion of synonymy see Foissner & Didier (1981). Kahl (1932) also supposed identity with *H. similis* Stokes, 1886. Common.

SLA & WEG: *Keronopsis monilata* (Kahl).

Gen.: *Homalozoon* Stokes, 1890

H. vermiculare (Stokes, 1887), Ann. Mag. nat. Hist., v. 20, p. 104 (*Litonotus vermicularis*).

MTL: Kahl, 1930b, p. 172 (DL); Foissner, 1984a, p. 90 (DS).

REM: A very rare ciliate. Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– – 2 8 –; – – 6 4 –).

SLA: *Homalozoon vermiculare* Stokes.

Gen.: *Hypotrichidium* Ilowaisky, 1921

H. conicum Ilowaisky, 1921, Rab. volzh. biol. Sta., v. 6, p. 97.

MTL: Kahl, 1932, p. 555 (DL); Fleury & Fryd-Versavel, 1984, p. 535 (DS).

REM: Several rather similar species have been described (Fleury & Fryd-Versavel, 1984). Planktonic, single record from a soil infusion (Foissner, 1987c).

Gen.: *Kellicotta* Curds, 1985

K. cuspidata (Kellicott, 1885), Proc. Am. microsc. Soc., v. 8, p. 39 (*Acineta c.*).

MTL: Curds, 1985, p. 121 (DL). – R!

SLA & WEG: *Acineta cuspidata* Stokes.

Gen.: *Kerona* Ehrenberg, 1835 (non O. F. Müller, 1773)

K. pediculus (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 54 (*Cyclidium p.*).

SYN: *Kerona polyporum* Ehrenberg, 1835, Abh. dt. Akad. Wiss., year 1835, p. 164.

MTL: Kahl, 1932, p. 569 (*Kerona polyporum*) (DL); Hemberger & Wilbert, 1982, p. 261 (*Kerona polyporum*) (DS).

REM: Discussion of synonymy see Foissner (1987a). Although a characteristic epizoon of *Hydra* spp., this species may be found in plankton samples, because single individuals are easily removed from their hosts. Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 7 3 – –; – 6 4 – –).

SLA & WEG: *Kerona polyporum* Ehrenberg.

Gen.: *Lacrymaria* Bory de St. Vincent, 1826

L. olor (O. F. Müller, 1786), Animalcula Infusoria, p. 75 (*Vibrio o.*).

MTL: Kahl, 1930b, p. 93 (DL); Pätsch, 1974, p. 13 (DS); Dragesco, & Dragesco-Kernéis, 1986, p. 146 (DS).

SLA: *Lacrymaria olor* O. F. Müller.

Gen.: *Lagenophrys* Stein, 1851

Revision (pro parte) of genus: Kane (1965).

L. labiata Stokes, 1887, Jl. R. microsc. Soc., year 1877, p. 40.

MTL: Kahl, 1935, p. 796 (DL). – R!

REM: Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (1 6 3 – –: – 6 4 – –).

L. vaginicola Stein, 1851, Z. wiss. Zool., v. 3, p. 500.

MTL: Kahl, 1935, p. 796 (DL). – R!

REM: Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 9 1 – –; – 6 4 – –).

Gen.: *Lagynophrya* Kahl, 1927

L. acuminata Kahl, 1935, Tierwelt Dtl., v. 30, p. 809.

MTL: None. – R!

REM: Genus in urgent need of revision. Sládeček *et al.* (1981) and Wegl (1983) assign this species wrongly (par lapsus?) to the genus *Lagenophrys* and give different saprobic valencies (– 8 2 – –; – 7 3 – –).

SLA & WEG: *Lagenophrys acuminata* Kahl.

Gen.: *Lagynus* Quennerstedt, 1867

L. cucumis (Penard, 1922), Études Infusoires, p. 46 (*Lacrymaria c.*).

MTL: Kahl, 1930b, p. 91 (*Lacrymaria c.*) (DL). – R!

REM: The *Lacrymaria cucumis* of Schmall (1976) is certainly another species, because it has not the characters mentioned in the original description.

SLA & WEG: *Lacrymaria cucumis* Penard.

L. elegans (Engelmann, 1862), Z. wiss. Zool., v. 11, p. 378 (*Lacrymaria e.*).

MTL: Kahl, 1930b, p. 90 (*Lacrymaria e.*) (DL). – R!

REM: A reinvestigation of this genus and species is urgent and promises interesting taxonomic results. It probably does not belong to the Lacrymariidae but to the Metacystidae.

SLA & WEG: *Lacrymaria elegans* Engelmann.

Gen.: *Lembadion* Perty, 1849

L. bullinum (O. F. Müller, 1786), Animalcula Infusoria, p. 116 (*Bursaria b.*).

MTL: Kahl, 1931, p. 327 (DL); Tuffrau, 1963, p. 479 (DS).

SLA: *Lembadion bullinum* Perty.

L. lucens (Maskell, 1887), Trans. Proc. N. Z. Inst., v. 20, p. 16 (*Thurophora l.*).

MTL: Kahl, 1931, p. 327 (DL); Dragesco, 1970, p. 65 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 337 (DS).

L. magnum (Stokes, 1887), Proc. Am. phil. Soc., v. 24, p. 248 (*Hymenostoma magna*).

MTL: Kahl, 1931, p. 327 (DL); Dragesco, 1970, p. 60 (DS); Pätsch, 1974, p. 33 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 336 (DS).

REM: The *L. magnum* of Dragesco (1970) is probably another, new species, if his observation that all somatic basal bodies are paired is correct.

Gen.: *Leptopharynx* Mermod, 1914 (Syn.: *Trichoderum* (for *Trichopelma*); see Corliss, 1979, p. 227)

L. costatus Mermod, 1914, Revue suisse Zool., v. 22, p. 58.

SYN(?): *Trichoderum sphagnetorum* (Levander, 1900), Acta Soc. Fauna Flora fenn., v. 18, p. 104 (*Trichopelma s.*).

MTL: Kahl, 1931, p. 303 (*Trichopelma sphagnetorum*) (DL); Foissner, 1979b, p. 127 (DS); Njine, 1979, p. 461 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 270 (DS).

REM: The synonymy between *Trichopelma sphagnetorum* and *Leptopharynx costatus,* suggested by Kahl (1931), is uncertain, because the descriptions of Levander (1900) and Mermod (1914) disagree in some important characters. In European waters Mermod's *L. costatus* is most common. The first synonym, *Leptopharynx,* acquired priority over *Trichopelma* and *Trichoderum* because both are preoccupied.

SLA & WEG: *Trichopelma sphagnetorum* (Levander).

Gen.: *Litonotus* Wrześniowski, 1870

Following Kahl (1931), this genus is frequently wrongly written as '*Lionotus*'.

L. anguilla (Kahl, 1931), Tierwelt Dtl., v. 21, p. 193 (*Lionotus a.*).

MTL: Dragesco & Dragesco & Kernéis, 1986, p. 183 (DL). – R!

SLA: *Litonotus anguilla* Kahl.

WEG: *Lionotus anguilla.*

L. carinatus Stokes, 1885, Am. J. Sci., v. 29, p. 324.

MTL: Kahl, 1931, p. 192 (*Lionotus c.*) (DL). – R!

WEG: *Lionotus carinatus.*

L. crystallinus (Vuxanovici, 1960), Studii Cerc. Biol., v. 12, p. 131 (*Lionotus c.*).

MTL: Foissner, 1984b, p. 199 (DS).

L. cygnus (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilum, p. 47 (*Vibrio c.*).

MTL: Kahl, 1931, p. 191 (*Lionotus c.*) (DL); Foissner, 1984b, p. 204 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 182 (DS).

SLA: *Litonotus cygnus* O. F. Müller.
WEG: *Lionotus cygnus.*

L. fasciola (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 48 (*Vibrio f.*).
MTL: Kahl, 1931, p. 194 (*Lionotus f.*) (DL). – R!
REM: I consider this species as a slightly contracted *L. cygnus,* because individuals of this species look rather similar to *L. fasciola,* if they are contracted. In addition, slightly damaged populations of *L. cygnus* sometimes do not fully extend after contraction, feigning a distinct species (Foissner, 1984b).
SLA: *Litonotus fasciola* (Ehrenberg).
WEG: *Lionotus fasciola.*

L. fusidens (Kahl, 1926), Arch. Protistenk., v. 55, p. 291 (*Lionotus f.*).
MTL: Kahl, 1931, p. 190 (*Hemiophrys f.*) (DL). – R!
REM: Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– – 3 4 3; – – 2 6 2).
SLA & WEG: *Hemiophrys fusidens* Kahl.

L. hirundo (Penard, 1922), Études Infusoires, p. 65 (*Lionotus h.*).
MTL: Kahl, 1931, p. 194 (*Lionotus h.*) (DL). – R!
SLA: *Litonotus hirundo* Penard.
WEG: *Lionotus hirundo.*

L. lamella (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 56 (*Kolpoda l.*).
SYN: *Loxophyllum lamella* Claparède & Lachmann, 1859, Mém. Inst. natn. génev., v. 6, p. 363.
MTL: Kahl, 1931, p. 193 (*Lionotus l.*) (DL); Foissner & O'Donoghue, 1988 (DS).
REM: The *L. lamella* which Fryd-Versavel *et al.* (1975) redescribed from silver stained preparations, is certainly an *Acineria incurvata* (Augustin *et al.,* 1987). Sládeček *et al.* (1981) and Wegl (1983) classify the saprobity of *Loxophyllum lamella* and *Litonotus lamella* very differently (– – 2 8 – and – 1 8 1 –, respectively). Certainly, something must be wrong with this evaluation, because *Loxophyllum lamella* is the objective synonym of *Litonotus lamella.*
SLA: *Litonotus lamella* (Ehrenberg) Schewiakoff and *Loxophylum lamella* Claparède et Lachmann.
WEG: *Lionotus lamella* and *Loxophylum lamella.*

L. procerus (Penard, 1922), Études Infusoires, p. 69 (*Lionotus p.*).
MTL: Kahl, 1931, p. 186 (*Hemiophrys procera*). – R!
REM: This species probably belongs to the genus *Amphileptus,* however, the reinvestigation of silver stained cells should be awaited, before it is transferred. Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 5 5 – –; – – 5 5 –).

L. varsaviensis Wrześniowski, 1870, Z. wiss. Zool., v. 20, p. 502.
SYN: *Hemiophrys bivacuolata* Kahl, 1931, Tierwelt Dtl., v. 21, p. 189; *Hemiophrys muscicola* Kahl, 1931, Tierwelt Dtl., v. 21, p. 188.
MTL: Kahl, 1931, p. 191 (*Lionotus v.*) (DL); Foissner, 1984b, p. 201 (DS).
REM: Synonymy after Foissner (1984b). The size and the shape of this species are very variable, depending on nutrition and habitat; it is, however, easily identified, because of its numerous contractile vacuoles. Sládeček *et al.* (1981) and Wegl (1983) give very different saprobic classifications for *H. bivacuolata* and *H. muscicola* (– – 10 + –; – – – 10 –). In my experience, *L. varsaviensis* is common under beta- to alpha-mesosaprobic conditions. In alpha- to polysaprobic environments voluminous individuals occur, for which Šrámek-Hušek (1954) created the 'forma *polysaprobica*' (see below).
SLA & WEG: *Hemiophrys bivacuolata* Kahl and *Hemiophrys muscicola* Kahl.

L. varsaviensis f. *polysaprobica* (Šrámek-Hušek, 1954), Arch. Protistenk., v. 100, p. 250 (*Hemiophrys bivacuolata* f. *polysaprobica*).
MTL: Foissner, 1984b, p. 201 (DS).
REM: See *Litonotus varsaviensis*!
SLA & WEG: *Hemiophrys bivacuolata* f. *polysaprobica* Šrámek-Hušek.

Gen.: *Loxocephalus* Eberhard, 1862

L. granulosus Kent, 1881, Manual infusoria II, p. 489.
MTL: Kahl, 1931, p. 344 (DL). – R!

L. luridus Eberhard, 1862, Oster-Programn Realschule Coburg, year 1862, p. 24.
MTL: Kahl, 1931, p. 343 (DL); Jankowski, 1964a,

p. 49 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 349 (DS); Wilbert, 1986, p. 384 (DS).

Gen.: *Loxodes* Ehrenberg, 1830
Review on fresh-water species: Dragesco & Dragesco-Kernéis (1986).
L. magnus Stokes, 1887, Ann. Mag. nat. Hist., v. 20, p. 106.
MTL: Kahl, 1931, p. 215 (DL); Foissner & Rieder, 1983, p. 3 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 205 (DS).
REM: Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– – – – 10; – – – 3 7).
L. rostrum (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 57 (*Kolpoda r.*).
MTL: Kahl, 1931, p. 213 (DL); Pätsch, 1974, p. 17 (DS).
L. striatus (Engelmann, 1862), Z. wiss, Zool., v. 11, p. 382. (*Drepanostoma striatum*).
MTL: Kahl, 1931, p. 215 (DL); Foissner & Rieder, 1983, p. 3 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 209 (DS).

Gen.: *Loxophyllum* Dujardin, 1841
L. helus (Stokes, 1884), Am. mon microsc. J., v. 5, p. 124 (*Litonotus h.*).
MTL: Kahl, 1931, p. 199 (DL); Foissner, 1978, p. 90 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 187 (DS).
REM: Redescription of protargol silver stained cells is recommended.
SLA & WEG: *Loxophylum helus* (Stokes).
L. meleagris (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 59 (*Kolpoda m.*).
MTL: Kahl, 1931, p. 202 (DL); Puytorac *et al.*, 1975, p. 379 (DS).
REM: More detailed characterization of protargol silver stained cells is recommended.
SLA & WEG: *Loxophylum meleagris* Dujardin.
L. utricullariae (Penard, 1922), Études Infusoires, p. 64 (*Amphileptus u.*).
MTL: Kahl, 1931, p. 198 (DL). – R!
SLA & WEG: *Loxophylum utricullariae* Penard.

Gen.: *Marituja* Gajevskaja, 1928
M. pelagica Gajevskaja, 1928, Dokl. Akad. Nauk. SSSR, v. 20, p. 476.
MTL: Kahl, 1930, p. 177 (DL); Gajewskaja, 1933, p. 46 (DL); Wilbert, 1972, p. 590 (DS).
REM: In the plankton of lakes and ponds; rare.
SLA & WEG: *Marijuta pelagica* Gajevskaja.

Gen.: *Mesodinium* Stein, 1863
M. acarus Stein, 1863, Amtl. Ber. Dt. Naturf. u. Aerzte, v. 62, p. 162.
MTL: Kahl, 1930b, p. 127 (DL). – R!
M. cinctum Calkins, 1902, Bull. U. S. Fish Commn., v. 21, p. 436.
MTL: Kahl, 1930b, p. 127 (DL). – R!
REM: Marine species! Occurrence in fresh-water unlikely.
M. pulex (Claparède & Lachmann, 1859), Mém. Inst. natn. génev., v. 6, p. 370 (*Halteria p.*).
MTL: Kahl, 1930b, p. 127 (partim) (DL); Dragesco, 1960, p. 146 (DL); Borror, 1972a, p. 38 (DS).
SLA & WEG: *Mesodinium pulex* Claparède et Lachmann.

Gen.: *Metacineta* Bütschli, 1889
Revision of genus: Rieder (1985).
M. mystacina (Ehrenberg, 1831), Abh. dt. Akad. Wiss., year 1831, p. 94 (*Cothurnia m.*).
MTL: Collin, 1912, p. 410 (DL); Guilcher, 1951, p. 95 (DS); Oppenheim, 1976, p. 9 (DL); Rieder, 1985, p. 201 (DL).
REM: Rieder (1985) split this species into several varieties.
SLA: *Metacineta mystacina* Ehrenberg.

Gen.: *Metopus* Claparède & Lachmann, 1858
M. contortus (Quennerstedt, 1867), Acta Univ. lund., v. 4, p. 23 (*Metopides contorta*).
MTL: Kahl, 1932, p. 417 (DL); Jankowski, 1964b, p. 193 (DL). – R!
REM: Nomenclature see *Brachonella spiralis* and Jankowski (1964b).
SLA: *Metopus contortus* Quennerstedt, syn. *Brachonella spiralis* (Smith) Jankowski.
M. es (O. F. Müller, 1776), Zoologiae Danicae Prodromus, p. 281 (*Trichoda S*).
SYN: *Metopus sigmoides* Claparède & Lachmann, 1858, Mém. Inst. natn. génev., v. 5, p. 255.
MTL: Kahl, 1932, p. 416 (DL); Jankowski, 1964b,

p. 188 (DL); Schmall, 1976, p. 28 (DS). – R!
REM: Synonymy after Kahl (1932). More detailed morphologic and biometric characterization of silver stained cells is recommended.
SLA & WEG: *Metopus es* (O. F. Müller) Kahl, syn. *M. sigmoides* and *Metopus sigmoides* Claparède et Lachmann.
M. fuscus Kahl, 1927, Arch. Protistenk., v. 57, p. 147.
MTL: Kahl, 1932, p. 413 (DL); Jankowski, 1964b, p. 192 (DL). – R!
M. ovalis Kahl, 1927, Arch. Protistenk., v. 57, p. 142.
MTL: Kahl, 1932, p. 418 (DL). – R!
M. spinosus Kahl, 1927, Arch. Protistenk., v. 57, p. 149.
MTL: Kahl, 1932, p. 416 (DL). – R!
M. striatus McMurrich, 1884, Am. Nat., v. 18, p. 830.
MTL: Kahl, 1932, p. 421 (DL); Jankowski, 1964b, p. 201 (DL); Foissner, 1980c, p. 80 (DL). – R!

Gen.: *Microthorax* Engelmann, 1862
M. pusillus Engelmann, 1862, Z. wiss. Zool., v. 11, p. 381.
MTL: Klein, 1928, p. 217 (DS); Kahl, 1931, p. 306 (DL); Foissner, 1979e, p. 30 (DS).
REM: Redescription and detailed biometric characterization of protargol silver stained cells is recommended. New fresh-water species of this genus have been described by Foissner (1985a).
M. sulcatus Engelmann, 1862, Z. wiss. Zool., v. 11, p. 381.
MTL: Kahl, 1931, p. 306 (DL). – R!

Gen.: *Monodinium* Fabre-Domergue, 1888
M. balbianii Fabre-Domergue, 1888, Annls. Sci. nat., v. 5, p. 35.
MTL: Kahl, 1930b, p. 125 (*Didinium b.*) (DL); Dragesco, 1970, p. 12 (DS); Foissner, 1979b, p. 122 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 173 (DS).
REM: Following Kahl (1930), this species is frequently assigned to the genus *Didinium*. Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 4 6 – –; – 4 5 1 –).
SLA & WEG: *Didinium balbiani* Bütschli.

Gen.: *Mucophrya* Gajevskaja, 1928
M. pelagica Gajevskaja, 1928, Dokl. Akad. Nauk SSSR, v. 20, p. 478.
MTL: None. – R!
SLA: *Mucophrya pelagica* Galevskaja.

Gen.: *Multifasciculatum* Goodrich & Jahn, 1943
Revision of genus: Jankowski (1981).
M. elongatum (Claparède & Lachmann, 1859), Mém. Inst. natn. génev., v. 6, p. 383 (*Podophrya elongata*).
MTL: Collin, 1912, p. 370 (*Discophrya e.*) (DL). – R!
REM: This species has been assigned for a long time with the genus *Discophrya* (Matthes, 1954a).
SLA & WEG: *Discophrya elongata* Claparède et Lachmann.

Gen.: *Myrionecta* Jankowski, 1976
M. rubra (Lohmann, 1908), Wiss. Meeresunters., v. 10, p. 175 (*Halteria r.*).
MTL: Taylor *et al.* 1971, p. 391 (*Mesodinium rubrum*) (DL); Grain *et al.* 1982, p. 7 (*Mesodinium rubrum*) (DS).
REM: Kahl (1930, p. 127) considers this species as a synonym of *Mesodinium pulex*. Exclusively marine. Records from fresh-water are obviously caused by Kahl's erroneous synonymy and by misidentification. Valuable ecological data in Taylor *et al.* (1971).
SLA & WEG: *Mesodinium rubrum* Lohmann.

Gen.: *Nassula* Ehrenberg, 1833
N. flava Claparède & Lachmann, 1859, Mém. Inst. natn. génev., p. 327.
MTL: Kahl, 1931, p. 222 (DL). – R!
REM: Claparède & Lachmann (1859) synonymize their species very likely erroneously with the *Chilodon ornatus* of Ehrenberg (1838).
N. gracilis Kahl, 1931, Tierwelt Dtl., v. 21, p. 218.
MTL: None. – R!
SLA: *Nassula gracilis* (Blochmann – Roux).
N. ornata Ehrenberg, 1833, Abh. dt. Akad. Wiss., year 1833, p. 304.
MTL: Kahl, 1931, p. 216 (DL); Foissner, 1979f, p. 201 (DS).
REM: Further populations should be studied.

Gen.: *Nassulopsis* Fauré-Fremiet, 1959
N. elegans (Ehrenberg, 1833), Abh. dt. Akad. Wiss., year 1833, p. 303 (*Nassula e.*).
MTL: Kahl, 1931, p. 223 (*Nassula e.*); Gelei, 1954, p. 287 (*Nassula e.*) (DL). – R!
SLA & WEG: *Nassula elegans* Ehrenberg.

Gen.: *Obertrumia* Foissner & Adam, 1981
O. aurea (Ehrenberg, 1833), Abh. dt. Akad. Wiss., year 1833, p. 305 (*Nassula a.*).
MTL: Kahl, 1931b, p. 217 (*Nassula a.*) (DL); Dragesco & Dragesco-Kernéis, 1986, p. 257 (*Nassula a.*) (DS).
REM: Nomenclature for the nassulide genera *Nassula, Obertrumia,* and *Zosterograptus* see Foissner (1987a).
SLA & WEG: *Nassula aurea* Ehrenberg.

Gen.: *Opercularia* Goldfuss, 1820
O. allensi Stokes, 1887, Proc. Am. phil. Soc., v. 24, p. 249.
MTL: Kahl, 1935, p. 706 (DL). – R!
REM: Probably synonymous with *O. coarctata.*
O. coarctata (Claparède & Lachmann, 1858), Mém. Inst. natn. génev., v. 5, p. 113 (*Epistylis c.*).
MTL: Kahl, 1935, p. 703 (DL); Guhl, 1979a, p. 308 (DL). – R!
REM: Interesting ecologic and taxonomic data in Guhl (1979a). He synonymizes, however, certainly too many species. Detailed reinvestigation of this species, which is common in running waters and activated sludge, is necessary.
SLA: *Opercularia coarctata* Claparède et Lachmann.
O. confusa Stiller, 1940, Arch. Hydrobiol., v. 36, p. 273.
MTL: None. – R!
O. curvicaulis (Penard, 1922), Études Infusoires, p. 276 (*Pyxidium curvicaule*).
MTL: Kahl, 1935 p. 697 (*Pyxidium c.*) (DL); Curds, 1964, p. 552 (*Pyxidiella curvicaula*). – R!
REM: Guhl (1979a) is probably right in synonymizing this species with *O. coarctata.* Likewise, identity with *O. arboricola* (Biegel, 1954) cannot be excluded (Foissner, 1981b). The redescription of Curds (1964) deals rather likely also with *O. coarctata.*
O. microdiscus Fauré-Fremiet, 1904, Archs. Anat. microsc., v. 7, p. 190 (*O. microdiscum*).
MTL: Kahl, 1935, p. 702 (DL); Sommer, 1951, p. 378 (DL). – R!
REM: Epizooic on *Eristalis*-larvae. Guhl (1979a) certainly synonymizes this species wrongly with *O. coarctata.*
O. minima Kahl, 1935, Tierwelt Dtl., v. 30, p. 702.
MTL: None. – R!
REM: Epizooic on the legs of water-mites. Guhl (1979a) certainly synonymizes this species wrongly with *O. coarctata.*
O. nutans (Ehrenberg, 1831), Abh. dt. Akad. Wiss., year 1831, p. 96 (*Epistylis n.*).
MTL: Kahl, 1935, p. 705 (DL); Foissner & Schiffmann, 1974, p. 504 (DS). – R!
REM: Redescription of protargol silver stained cells is recommended. Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– – 7 3 – ; – – 6 4 –).
O. phryganeae Kahl, 1935, Tierwelt Dtl., v. 30, p. 703.
MTL: Nenninger, 1948, p. 207 (DL). – R!
WEG: *Opercularia phryganea.*
O. ramosa Stokes, 1889, Jl. R. microsc. Soc., v. 1, p. 478 (*Epistylis r.*)
MTL: Kahl, 1935, p. 706 (DL). – R!
O. stenostoma Stein, 1854, Die Infusionsthiere, p. 74.
MTL: D'Udekem, 1864, p. 22 (DL); Kahl, 1935, p. 701 (DL). – R!
REM: Stein (1854) published this species without giving any figure. Kent (1881) and Kahl (1935) rightly doubt the redescription of D'Udekem (1864). A revision of the genus must decide the taxonomic status of this species.
SLA: *Opercularia stenostoma* Stein – D'Udekem.

Gen.: *Ophrydium* Bory de St. Vincent, 1826
Revision of the genus: Guhl (1985).
O. crassicaule Penard, 1922, Études Infusoires, p. 284.
MTL: Kahl, 1935, p. 756 (DL); Guhl, 1985, p. 140 (DL). – R!
O. sessile Kent, 1882, Manual infusoria II, p. 738.
MTL: Kahl, 1935, p. 755 (DL); Guhl, 1985, p. 138 (DL). – R!

O. versatile (O. F. Müller, 1786), Animalcula Infusoria, p. 281 (*Vorticella versatilis*).
MTL: Kahl, 1935, p. 755 (DL); Wilbert, 1977, p. 54 (DS); Foissner *et al.*, 1984, p. 46 (DS).
REM: On superficial investigation easily mixed up with *O. eutrophicum* Foissner. For detailed comparison of *O. versatile* and *O. eutrophicum* see Foissner *et al.* (1984).
SLA: *Ophrydium versatile* Müller.

Gen.: *Ophryoglena* Ehrenberg, 1831
O. atra Lieberkühn, 1856, Arch. Anat. Physiol., year 1856, p. 20.
MTL: Kahl, 1931, p. 361 (DL); Mugard, 1949, p. 188 (DL); Canella & Rocchi-Canella, 1976, p. 1ff (DS); Agamaliev, 1983, p. 88 (DS). – R!
REM: Nomenclature and taxonomy very unclear, because Lieberkühn never formally established an *Ophryoglena atra*! This has been done by Kahl (1931), who transferred Ehrenberg's *Ophryoglena atra* to the genus *Frontonia*. This has been not accepted by later revisers (e.g. Mugard, 1949).
O. flava (Ehrenberg, 1833), Abh. dt. Akad. Wiss., year 1833, p. 233 (*Bursaria f.*).
MTL: Kahl, 1931, p. 361 (DL); Mugard, 1949, p. 189 (DL). – R!
SLA: *Ophryoglena flava* Ehrenberg.
O. oblonga Gajevskaja, 1927, Dokl. Akad. Nauk SSSR, v. 19, p. 315.
MTL: Kahl, 1931, p. 361 (DL). – R!

Gen.: *Opisthonecta* Fauré-Fremiet, 1906
Revision of genus: Foissner (1975).
O. henneguyi Fauré-Fremiet, 1906, C. r. Séanc. Soc. Biol., v. 60, p. 922.
MTL: Kahl, 1935, p. 633 (DL); Foissner, 1975, p. 406 (DL). – R!
REM: Probably often confused with *O. patula* Foissner, 1975.
SLA & WEG: *Telotrochidium henneguyi* Fauré-Fremiet.

Gen.: *Oxytricha* Bory de St. Vincent, 1825
Revision of genus: Hemberger (1982).
O. aeruginosa Wrześniowski, 1870, Z. wiss. Zool., v. 20, p. 471.
MTL: Kahl, 1932, p. 602 (DL); Pätsch 1974, p. 58 (DS); Agamaliev, 1983, p. 108 (DS). – R!
REM: Redescription necessary, because the determinations of Pätsch (1974) and Agamaliev (1983) are doubtful. One may identify with this species only a slender form with reddish cytoplasm and caudal cirri.
O. chlorelligera Kahl, 1932, Tierwelt Dtl., v. 25, p. 601.
MTL: None. – R!
O. fallax Stein, 1859, Organismus der Infusionsthiere I, p. 189.
MTL: Kahl, 1932, p. 602 (DL); Foissner, 1979b, p. 131 (DS); Schmall, 1976, p. 38 (DS); Hemberger, 1982, p. 143 (DS). – R!
REM: Although several redescriptions exist, a clear separation from other species of the genus is still impossible (Hemberger, 1982).
O. ludibunda Stokes, 1891, Jl. R. microsc. Soc., year 1891, p. 702.
MTL: Kahl, 1932, p. 603 (DL). – R!
REM: Hemberger (1982) synonymizes this species with *O. hymenostomata* Stokes.
O. saprobia Kahl, 1932, Tierwelt Dtl., v. 25, p. 603.
MTL: None. – R!
O. setigera Stokes, 1891, Jl. R. microsc. Soc., year 1891, p. 701.
MTL: Kahl, 1932, p. 604 (DL); Foissner, 1982b, p. 83 (DS).
REM: Common in soil (Foissner, 1987c).
O. similis Engelmann, 1862, Z. wiss. Zool., v. 11, p. 388.
MTL: Kahl, 1932, p. 611 (*Opisthotricha s.*) (DL); Hemberger, 1982, p. 164 (DS). – R!
REM: Engelmann (1862) describes two prominent caudal cirri, which are splayed to the right. Thus, the redescription of Hemberger (1982) is doubtful, because his species has three caudal cirri.
SLA & WEG: *Opisthotricha similis* Engelmann.

Gen.: *Papillorhabdos* Foissner, 1984
P. carchesii Foissner, 1984, Stapfia, v. p. 42 (DS).

Gen.: *Paracolpoda* Lynn, 1978
P. steinii (Maupas, 1883), Archs. Zool. exp. gén., v. 1, p. 436 (*Colpoda s.*).
MTL: Kahl, 1931, p. 281 (*Colpoda steini*) (DL); Lynn, 1976b, p. 302 (*Colpoda s.*) (DS); Foissner,

1980a, p. 412 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 247 (DS).

REM: This genus is not generally accepted. Thus, one may write also '*Colpoda steinii* Maupas, 1883'. Very common in soil (Foissner, 1987c). Occurrence of *Colpoda* and/or *Paracolpoda* in running and stagnant waters indicates edaphic influence.

SLA & WEG: *Colpoda steinii* Maupas.

Gen.: *Paradileptus* Wenrich, 1929

P. elephantinus (Švec, 1897), Bull. int. Acad. tchéque Sci., v. 4, p. 41 (*Dileptus e.*).

MTL: Kahl, 1931, p. 210 (DL); Fryd-Versavel *et al.*, 1975, p. 520 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 165 (DL). – R!

REM: Reinvestigation is necessary, because the above mentioned redescriptions are too incomplete. Only planktonic.

SLA: *Paradileptus elephantinus* Švec.

Gen.: *Paramecium* O. F. Müller, 1773

Revision of genus: Wichtermann (1953).

P. aurelia complex (*P. aurelia* O. F. Müller, 1773, Vermium Terrestrium et Fluviatilium, p. 54).

MTL: Klein, 1926, p. 266 (DS); Klein, 1927, p. 129 (DS); Kahl, 1931, p. 291 (DL); Wichtermann, 1953, p. 22 (DS); Dragesco, 1970, p. 45 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 305 (DS).

REM: See chapter 2. 2.! Very common in all perennial waters, however, some species of the complex are probably endemic. Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– – 5 5 –; – – 3 7 –).

SLA & WEG: *Paramecium aurelia* Ehrenberg.

P. bursaria (Ehrenberg, 1831) Abh. dt. Akad. Wiss., year 1831, p. 109 (*Loxodes b.*).

MTL: Kahl, 1931, p. 293 (DL); Wichtermann, 1953, p. 25 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 304 (BS).

REM: Sole valid species of the genus with zoochlorellae. Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– – 7 3 –; – – 4 6 –).

SLA: *Paramecium bursaria* Ehrenberg.

P. calkinsi Woodruff, 1921, Biol. Bull., v. 41, p. 171.

MTL: Kahl, 1931, p. 294 (DL); Wichtermann, 1953, p. 28 (DL); Agamaliev, 1983, p. 79 (DS).

P. caudatum Ehrenberg, 1833, Abh. dt. Akad. Wiss., year 1833, p. 268.

MTL: Kahl, 1931, p. 291 (DL); Wichtermann, 1953, p. 21 (DS); Jankowski, 1969, p. 36 (DS); Dragesco, 1970, p. 45 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 307 (DS).

REM: This species is common in heavily polluted water and consists probably of a complex of sibling species, like *P. aurelia* (Khadem & Gibson, 1985). Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– – – 7 3; – – – 4 6).

P. putrinum Claparède & Lachmann, 1859, Mém. Inst. natn. génev., v. 6, p. 266.

SYN: *Paramecium trichium* Stokes, 1885, Am. Nat., v. 19, p. 438.

MTL: Kahl, 1931, p. 293 (*P. trichium*) (DL); Wichtermann, 1953, p. 26 (*P. trichium*) (DL); Jankowski, 1972, p. 285 (DS).

REM: Synonymy rightly discussed and species well redescribed by Jankowski (1972).

SLA & WEG: *Paramecium trichium* Stokes, syn. *P. putrinum* Claparède et Lachmann.

P. woodruffi Wenrich, 1928, Trans. Am. microsc. Soc., v. 47, p. 256.

MTL: Kahl, 1931, p. 294 (DL); Wichtermann, 1953, p. 31 (DL); Jankowski, 1969, p. 36 (DS); Agamaliev, 1983, p. 83 (DS).

REM: Biometric characterization of silver stained cells is recommended.

Gen.: *Paraurostyla* Borror, 1972

P. viridis (Stein, 1859), Organismus der Infusionsthiere I, p. 206 (*Urostyla v.*).

MTL: Kahl, 1932, p. 567 (*Urostyla v.*) (DL); Pätsch, 1974, p. 56 (*Parurostyla v.*) (DS);

SLA & WEG: *Urostyla viridis* Stein.

P. weissei (Stein, 1859), Organismus der Infusionsthiere I, p. 192 (*Urostyla w.*).

MTL: Kahl, 1932, p. 568 (*Urostyla w.*) (DL); Pätsch, 1974, p. 55 (*Parurostyla w.*) (DS); Wirnsberger *et al.*, 1985b, p. 1 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 435 (DS).

SLA & WEG: *Urostyla weissei* Stein.

Gen.: *Paruroleptus* Kahl, 1932

P. musculus Kahl, 1932, Tierwelt Dtl., v. 25, p. 588.
MTL: Foissner, 1984a, p. 109.

Gen.: *Pelodinium* Lauterborn, 1908
P. reniforme Lauterborn, 1908, Z. wiss. Zool., v. 90, p. 663.
MTL: Kahl, 1932, p. 527 (DL); Jankowski, 1964b, p. 251 (DL). – R!

Gen.: *Phascolodon* Stein, 1859
P. vorticella Stein, 1859, Lotos, v. 9, p. 2.
MTL: Kahl, 1931, p. 232 (DL); Foissner, 1979d, p. 558 (DS).
REM: Sporadic in stagnant and slowly running waters; if present, then often abundant.

Gen.: *Phialina* Bory de St. Vincent, 1826
P. coronata (Claparède & Lachmann, 1859), Mém. Inst. natn. génev., v. 6, p. 303 (*Lacrymaria c.*).
MTL: Kahl, 1930b, p. 95 (*Lacrymaria c.*) (DL); Agamaliev, 1983, p. 60 (*Lacrymaria c.*) (DS); Dragesco & Dragesco-Kernéis, 1986, p. 147 (*Lacrymaria c.*) (DS).
REM: Euryhyaline; reliable records from fresh-water unknown. Nomenclature see Foissner (1987a).
SLA & WEG: *Lacrymaria coronata* Claparède et Lachmann.
P. pupula (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 37 (*Enchelis p.*).
MTL: Kahl, 1930b, p. 94 (*Lacrymaria p.*) (DL). – R!
SLA & WEG: *Lacrymaria pupula* O. F. Müller.

Gen.: *Philasterides* Kahl, 1931
P. armata (Kahl, 1926), Arch. Protistenk., v. 55, p. 359 (*Lembus armatus*).
MTL: Kahl, 1931, p. 366 (DL); Mugard, 1949, p. 204 (DS); Grolière, 1980, p. 197 (DS).
SLA: *Philasterides armata* Kahl.

Gen.: *Placus* Cohn, 1866
P. luciae (Kahl, 1926), Arch. Protistenk., v. 55, p. 238 (*Thoracophrya l.*).
MTL: Kahl, 1930b, p. 88 (DL); Foissner, 1972a, p. 83 (DS); Pätsch, 1974, p. 12 (DS).
REM: Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 5 5 – –; – 4 6 – –).
SLA: *Placus luciae* Kahl.
P. ovum (Kahl, 1926), Arch. Protistenk., v. 55, p. 246 (*Thoracophrya o.*).
MTL: Kahl, 1930b, p. 89 (DL). – R!
SLA: *Placus ovum* Kahl.

Gen.: *Plagiocampa* Schewiakoff, 1892
P. longis Kahl, 1927, Arch. Protistenk., v. 60, p. 60.
MTL: Kahl, 1930b, p. 64 (DL). – R!

Gen.: *Plagiopyla* Stein, 1860
P. nasuta Stein, 1860, Sber. K. böhm. Ges. Wiss., year 1860, p. 58.
MTL: Klein, 1930, p. 253 (DS); Kahl, 1931, p. 264 (DL); Jankowski, 1964b, p. 286 (DL); Borror, 1972a, p. 46 (DS); Schmall, 1976, p. 24 (DS); Agamaliev, 1983, p. 68 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 217 (DS).
WEG: *Plagiocampa nasuta* (par lapsus?).
P. simplex Wetzel, 1928, Z. Morph. Ökol. Tiere, v. 13, p. 195.
MTL: Kahl, 1931, p. 265 (DL). – R!

Gen.: *Platycola* Kent, 1882
P. truncata (Fromentel, 1876), Études Microzoaires, p. 251 (*Vaginicola t.*).
MTL: Kahl, 1935, p. 791 (DL); Kralik, 1961, p. 201 (DL); Pätsch, 1974, p. 43 (DS).
REM: Interesting ecological data in Kralik (1961). Sometimes abundant on exposited slides.
SLA: *Platycola truncata* Fromentel.

Gen.: *Platynematum* Kahl, 1935
P. sociale (Penard, 1922), Études Infusoires, p. 112 (*Uronema s.*).
MTL: Kahl, 1931, p. 346 (*Platynema s.*) (DL). – R!
REM: A poorly known genus whose reinvestigation promises interesting taxonomic results.
SLA: *Platynematum sociale* (Penard) Kahl, syn. *Uronema sociale.*

Gen.: *Platyophrya* Kahl, 1926
P. vorax Kahl, 1926, Arch. Protistenk., v. 55, p. 234.
MTL: Kahl, 1930b, p. 65 (DL); Foissner, 1978c, p. 219 (DS); Foissner, 1980a, p. 404 (DS).
REM: Several rather similar species which are difficult to separate (Foissner, 1980a, b). Common in all terrestrial habitats, rare in fresh-water.

Gen.: *Pleuronema* Dujardin, 1836

P. coronatum Kent, 1881, Manual infusoria II, p. 544.

MTL: Kahl, 1931, p. 388 (DL); Dragesco, 1968, p. 91 (DS); Agamaliev, 1983, p. 92 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 355 (DS).

REM: The populations of Dragesco (1968) and Agamaliev (1983) are from marine habitats. Silver staining must be made to see, if they really correspond to those from fresh-water. Their oral structures are very similar to those of *P. crassum* redescribed by Pätsch (1974).

P. crassum Dujardin, 1841, Zoophytes, p. 747 (*P. crassa*).

MTL: Kahl, 1931, p. 387 (DL); Pätsch, 1974, p. 36 (DS).

P. setigerum Calkins, 1902, Bull. U.S. Fish Comn., v. 21, p. 445 (*P. setigera*).

MTL: Kahl, 1931, p. 389 (DL); Borror, 1963, p. 498 (DS).

REM: Marine species! Occurrence in fresh-water must be verified by silver staining.

Gen.: *Pleurotricha* Stein, 1859

P. grandis Stein, 1859, Lotos, v. 9, p. 4.

MTL: Kahl, 1932, p. 593 (DL). – R!

REM: The *Pleurotricha grandis* of Schmall (1987) is certainly another species. *Pleurotricha grandis* is obviously very rare, because a reliable redescription has not been published up to now (Hemberger, 1982).

Gen.: *Podophrya* Ehrenberg, 1838

P. fixa (O. F. Müller, 1786), Animalcula Infusoria, p. 217 (*Trichoda f.*).

MTL: Collin, 1912, p. 396 (DL); Chatton *et al.*, 1929, p. 1191 (DS); Reibenbach & Reich, 1968, p. 259 (DL); Foissner, 1974, p. 15, 41 (DS).

REM: Interesting ecological data in Laybourn (1976a, b).

SLA: *Podophrya fixa* (Quennerstedt).

P. maupasii Bütschli, 1889, Infusoria, p. 1927.

MTL: Collin, 1912, p. 398 (DL). – R!

SLA & WEG: *Podophrya maupasi* Bütschli.

Gen.: *Propyxidium* Corliss, 1979

P. nutans (Stokes, 1889), Jl. R. microsc. Soc, v. 1, p. 479 (*Pyxidium n.*).

MTL: Kahl, 1935, p. 698 (*Pyxidium n.*) (DL). – R!

REM: Nomenclature see Corliss (1979, p. 274). The older names, *Pyxidium* and *Pyxidiella,* are preoccupied.

SLA & WEG: *Pyxidium nutans* Stokes.

Gen.: *Prorodon* Ehrenberg, 1833

Most species of this voluminous genus need silver impregnation for a reliable determination (comp. genus *Holophrya*!).

P. ovum (Ehrenberg, 1831), Abh. dt. Akad. Wiss., year 1831, p. 102 (*Holophrya o.*).

SYN: *Holophrya discolor* Ehrenberg, 1833, Abh. dt. Akad. Wiss., year 1833, p. 251; *Prorodon discolor* Kahl, 1930, Tierwelt Dtl., v. 18, p. 76.

MTL: Kahl, 1930b, p. 76 (DL); Foissner, 1983, p. 54 (DS).

REM: *Prorodon discolor* is the theront-stage of *P. ovum* (Foissner 1983). Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies for *P. ovum* (– – 10 – –) and its synonym *P. discolor* (– 5 5 – –).

SLA & WEG: *Prorodon* (*Holophrya*) *discolor* (Ehrenberg) Kahl and *Prorodon* (*Holophrya*) *ovum* (Ehrenberg) Kahl.

P. platyodon Blochmann, 1895, Mikroskopische Tierwelt, p. 90.

MTL: Kahl, 1930b, p. 80 (DL). – R!

P. teres Ehrenberg, 1833, Abh. dt. Akad. Wiss., year 1833, p. 308.

MTL: Kahl, 1930b, p. 80 (DL); Foissner, 1983, p. 57 (DS).

P. viridis Kahl, 1927, Arch. Protistenk., v. 60, p. 79.

MTL: Kahl, 1930b, p. 74 (DL). – R!

SLA: *Prorodon viridis* (Ehrenberg) Kahl.

Gen.: *Pseudoblepharisma* Kahl, 1927

P. tenue (Kahl, 1926), Arch. Protistenk., v. 55, p. 422 (*Blepharisma tenuis*).

MTL: Kahl, 1932, p. 442 (DL). – R!

REM: Redescription of a closely related species, *P. crassum,* in Grolière (1977).

SLA: *Pseudoblepharisma tenue* Kahl.

WEG: *Pseudoplepharisma tenue.*

Gen.: *Pseudochilodonopsis* Foissner, 1979

P. algivora (Kahl, 1931), Tierwelt Dtl., v. 21, p. 240 (*Chilodonella a.*).
MTL: Foissner, 1979b, p. 125 (DS).
SLA & WEG: *Chilodonella algivora* Kahl.
P. piscatoris (Blochmann, 1895), Mikroskopische Thierwelt, p. 95 (*Chilodon p.*).
MTL: Kahl, 1931, p. 241 (*Chilodonella p.*) (DL); Foissner, 1979b, p. 104 (DS).
WEG: *Chilodonella piscatoris.*

Gen.: *Pseudocohnilembus* Evans & Thompson, 1964
Revision of genus: Foissner & Wilbert (1981).
P. pusillus (Quennerstedt, 1869), Acta Univ. lund., v. 6, p. 16 (*Lembus p.*).
SYN: *Cohnilembus pusillus* Kahl, 1935, Tierwelt Dtl., v. 30, p. 835.
MTL: Kahl, 1931, p. 371 (*Lembus p.*); Foissner & Wilbert, 1981, p. 295 (DS).
REM: *Lembus* was changed to *Cohnilembus* because of preoccupation. Then, *Cohnilembus* was split into the genera *Pseudocohnilembus* and *Cohnilembus.* Easily confused with *Uronema* spp. and *Pseudocohnilembus putrinus.* Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– – – 6 4; – – – 5 5) for *Cohnilembus pusillus* and *Lembus pusillus,* although these are objective synonyms of the single species, *Pseudocohnilembus pusillus.*
SLA & WEG: *Cohnilembus pusillus* Quennerstedt and *Lembus pusillus* Quennerstedt.

Gen.: *Pseudoglaucoma* Kahl, 1931
P. muscorum Kahl, 1931, Tierwelt Dtl., v. 21, p. 335.
MTL: None. – R!
REM: A poorly known genus whose reinvestigation promises interesting taxonomic results.

Gen.: *Pseudokeronopsis* Borror & Wicklow, 1983
P. rubra (Ehrenberg, 1835), Abh. dt. Akad. Wiss., year 1835, p. 164 (*Oxytricha r.*).
SYN: *Keronopsis rubra* Kahl, 1932, Tierwelt Dtl., v. 25, p. 571.
MTL: Foissner, 1984a, p. 111 (DS).
REM: Detailed taxonomic and nomenclatural discussion in Foissner (1984a). I am convinced that this marine species does not occur in fresh-water. It has been very probably confused with other red hypotrichs, e.g. *Keronopsis pseudorubra* Kaltenbach, 1960, *Steinia ferruginea* (Stein, 1859), *Oxytricha aeruginosa* Wrześniowski, 1870.
SLA & WEG: *Keronopsis rubra* (Ehrenberg).

Gen.: *Pseudomicrothorax* Mermod, 1914
P. agilis Mermod, 1914, Revue suisse Zool., v. 22, p. 67.
MTL: Kahl, 1931, p. 301 (DL); Peck, 1974, p. 333 (DS).

Gen.: *Pseudoprorodon* Blochmann, 1895
P. ellipticus Kahl, 1930, Tierwelt Dtl., v. 18, p. 70.
MTL: None. – R!
WEG: *Pseudomicrothorax ellipticus* (par lapsus?).
P. niveus (Ehrenberg, 1833), Abh. dt. Akad. Wiss., year 1833, p. 308 (*Prorodon n.*).
MTL: Kahl, 1930b, p. 68 (DL); Grolière, 1977, p. 272 (DS).
REM: The unusual infraciliature which Grolière (1977) describes needs confirmation. In addition, a detailed biometric characterization is necessary, because several rather similar species have been described.
SLA & WEG: *Prorodon niveus* Ehrenberg.

Gen.: *Pseudovorticella* Foissner & Schiffmann, 1974
Revision of genus: Jankowski (1976b), Warren (1987).
P. chlamydophora (Penard, 1922), Études Infusoires, p. 259 (*Vorticella c.*).
MTL: Kahl, 1935, p. 731 (*Vorticella c.*) (DL). – R!
REM: Warren (1987) considers this species as a synonym of *Vorticella vestita* Stokes.
SLA & WEG: *Vorticella chlamydophora* Penard.
P. margaritata (Fromentel, 1876), Études Microzoaires, p. 235 (*Vorticella m.*).
MTL: Kahl, 1935, p. 730 (*Vorticella m.*) (DL); Warren, 1987, p. 3 (DL). – R!
SLA & WEG: *Vorticella margaritata* Fromentel.
P. monilata (Tatem, 1870), Mon. microsc. J., v. 3, p. 194 (*Vorticella convallaria* var. *monilata*).
MTL: Schröder, 1906c, p. 395 (*Vorticella m.*) (DL); Kahl, 1935, p. 730 (*Vorticella m.*) (DL); Foissner & Schiffmann, 1974, p. 498 (DS); Pätsch, 1974, p. 41 (*Vorticella m.*); Foissner, 1979a, p. 533 (DS); Warren, 1987, p. 4 (DS).
SLA & WEG: *Vorticella monilata* Tatem.

Gen.: *Pyxicola* Kent, 1882
Revision of genus: Trueba (1978).
P. carteri Kent, 1882, Manual infusoria II, p. 729.
SYN: *Pyxicola carteri* f. *constricta* Sommer, 1951, Arch. Hydrobiol., v. 44, p. 417.
MTL: Kahl, 1935, p. 787 (*P. constricta*); Trueba, 1978, p. 231 (DL). – R!
REM: Synonymy after Trueba (1978).
SLA & WEG: *Pyxicola carteri* f. *constricta* Sommer.

Gen.: *Rhabdostyla* Kent, 1881
R. inclinans (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 116 (*Vorticella i.*).
MTL: Kahl, 1935, p. 675 (DL); Guhl, 1972, p. 351 (*Opercularia i.*) (DL). – R!
REM: The new combination suggested by Guhl (1972) is based on his doubtful assumption that several other species of colonial peritrichs are synonymous with *R. inclinans.*

Gen.: *Saprodinium* Lauterborn, 1908
S. dentatum (Lauterborn, 1901), Zool. Anz., v. 24, p. 54 (*Discomorpha dentata*).
MTL: Kahl, 1932, p. 526 (DL); Jankowski, 1964b, p. 257 (DL). – R!
SLA: *Saprodinium dentatum* Lauterborn.
S. putrinium Lackey, 1925, New Jers. Agric. Exp. Stn. Bull. no 417, p. 35.
MTL: Kahl, 1932, p. 526 (DL). – R!
WEG: *Saprodinium putrinum* Lackey.

Gen.: *Sathrophilus* Corliss, 1960
S. mobilis (Kahl, 1926), Arch. Protistenk., v. 55, p. 340 (*Saprophilus m.*).
MTL: Kahl, 1931, p. 349 (*Saprophilus m.*) (DL.) – R!
REM: Very likely a species of the *Tetrahymena pyriformis* complex.
SLA & WEG: *Saprophilus mobilis* Kahl.
S. muscorum (Kahl, 1931), Tierwelt Dtl., v. 21, p. 350 (*Saprophilus m.*).
MTL: Buitkamp, 1977, p. 264 (DS); Foissner *et al.*, 1982b, p. 455 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 351 (DS).
REM: In terrestrial biotopes much more common than in the limnosaprobic area (Foissner, 1987c).
SLA & WEG: *Saprophilus muscorum* Kahl.

Gen.: *Scyphidia* Dujardin, 1841
S. hyalina Biegel, 1954, Arch. Protistenk., v. 100, p. 155.
MTL: None. – R!
S. rugosa Dujardin, 1841, Zoophytes, p. 538.
MTL: Kahl, 1935, p. 670 (DL). – R!

Gen.: *Spathidium* Dujardin, 1841
S. depressum Kahl, 1930, Arch. Protistenk., v. 70, p. 364.
MTL: Kahl, 1930b, p. 151 (DL). – R!
REM: The reinvestigation of silver stained cells will very likely demand a transfer of this species to the genus *Arcuospathidium* Foissner, 1984. Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 7 3 – –; – 6 4 – –).
S. faurei Kahl, 1930, Arch. Protistenk., v. 70, p. 363.
MTL: Kahl, 1930b, p. 150 (DL). – R!
REM: The reinvestigation of silver stained cells will very likely show that this species needs a genus of its own. Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 7 3 – –; – 6 4 – –).
S. gibbum Kahl, 1930, Tierwelt Dtl., v. 18, p. 155.
MTL: None. – R!
S. spathula (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 38 (*Enchelis s.*)
MTL: Kahl, 1930, p. 161 (DL); Foissner, 1984a, p. 70 (DS).
REM: Common in terrestrial biotopes, rare in running waters (Foissner, 1987c).
SLA: *Spathidium spathula* O. F. Müller.

Gen.: *Sphaerophrya* Claparède & Lachmann, 1859
S. magna Maupas, 1881, Archs. Zool. exp. gén., v. 9, p. 299.
MTL: Collin, 1912, p. 401 (DL); Oppenheim, 1976, p. 11 (DL). – R!
S. pusilla Claparède & Lachmann, 1859, Mém. Inst. natn. génev., v. 6, p. 385.
MTL: Collin, 1912, p. 402 (DL); Oppenheim, 1976, p. 12 (DL). – R!
S. soliformis Lauterborn, 1908, Z. wiss. Zool., v. 90, p. 666.
MTL: Collin, 1912, p. 401 (DL). – R!
S. stentoris Maupas, 1881, Archs. Zool. exp. gén., v. 9, p. 304.

MTL: Collin, 1912, p. 403 (DL). – R!

Gen.: *Spirostomum* Ehrenberg, 1833
Revision of genus: Repak & Isquith (1974).
S. ambiguum (O. F. Müller, 1786), Animalcula Infusoria, p. 200 (*Trichoda ambigua*).
MTL: Kahl, 1932, p. 437 (DL); Boggs, 1965, p. 603 (DS). – R!
REM: The *Spirostomum ambiguum* of Pätsch (1974) is probably another species (*S. intermedium*?). Redescription of protargol silver impregnated cells is recommended.
SLA: *Spirostomum ambiguum* Müller-Ehrenberg.
S. caudatum (O. F. Müller, 1786), Animalcula Infusoria, p. 34 (*Enchelis caudata*).
SYN: *Spirostomum filum* (Ehrenberg, 1833), Abh. dt. Akad. Wiss., year 1833, p. 277 (*Uroleptus f.*).
MTL: Kahl, 1932, p. 440 (*S. filum*) (DL). – R!
REM: I agree with the synonymy suggested by Repak & Isquith (1974). Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 7 3 – –; – 6 4 – –).
SLA & WEG: *Spirostomum filum* (Ehrenberg) Penard.
S. intermedium Kahl, 1932, Tierwelt Dtl., v. 25, p. 439.
MTL: None. – R!
S. minus (Roux, 1901), Faune infusorienne, p. 80 (*Spirostomum ambiguum* var. *minor*).
MTL: Kahl, 1932, p. 440 (DL); Boogs, 1965, p. 603 (DS). – R!
REM: Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– – 4 6 –; – – 3 7 –).
SLA: *Spirostomum minus* Roux.
S. teres Claparède & Lachman, 1858, Mém. Inst. nat. génev., v. 5, p. 233.
MTL: Kahl, 1932, p. 440 (DL); Boogs, 1965, p. 603 (DS); Pätsch, 1974, p. 48 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 378 (DS).

Gen.: *Staurophrya* Zacharias, 1893
S. elegans Zacharias, 1893, ForschBer. biol. Stn. Plön, v. 1, p. 18.
MTL: Collin, 1912, p. 382 (DL). – R!

Gen.: *Steinia* Diesing, 1866
S. ferruginea (Stein, 1859), Organismus der Infusionsthiere I, p. 187 (*Oxytricha f.*).
MTL: Kahl, 1932, p. 612 (DL); Reuter, 1961, p. 19 (DL). – R!
SLA: *Oxytricha ferruginea* Stein and *Steinia ferruginea* (Stein), syn. *Oxytricha ferruginea* Stein.
WEG: *Oxytricha ferruginea.*
S. platystoma (Ehrenberg, 1831), Abh. dt. Akad. Wiss., year 1831, p. 111 (*Oxytricha p.*).
MTL: Kahl, 1932, p. 612 (DL); Dragesco, 1970, p. 119 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 479 (DS).
REM: Redescription and detailed biometrical characterization of silver stained cells is recommended, because Dragesco (1970) and Dragesco & Dragesco-Kernéis (1986) treat the oral structures too superficially.
SLA & WEG: *Oxytricha platystoma* (Ehrenberg – Stein).

Gen.: *Stentor* Oken, 1815
Monograph of genus: Tartar (1961). Nomenclature: Kirby (1954).
S. coeruleus (Pallas, 1766), Elenchus Zoophytorum, p. 95 (*Brachionus stentoreus* var. *coerulei*).
MTL: Kahl, 1932, p. 463 (DL); Tuffrau, 1967, p. 385 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 405 (DS). – R!
REM: Tuffrau (1967) and Dragesco & Dragesco-Kernéis (1986) show only details. Following Kahl (1932), Ehrenberg (1830) is frequently cited as describer. Ehrenberg (1930), however, uses the name given by Pallas (1776), who should be, thus, credited with the species.
SLA & WEG: *Stentor coeruleus* Ehrenberg.
S. igneus Ehrenberg, 1838, Infusionsthierchen, p. 264.
MTL: Kahl, 1932, p. 464 (DL). – R!
REM: Nomenclature see Foissner (1987a). The older name, *Stentor aureus,* has been suggested as a *nomen oblitum.*
S. muelleri (Bory de St. Vincent, 1825), Encyclopédie méthod., p. 697–700 (*Stentorina mülleri*).
MTL: Kahl, 1932, p. 464 (*S. mülleri*) (DL). – R!
S. niger (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 96 (*Vorticella nigra*).

MTL: Kahl, 1932, p. 465 (DL); Dragesco & Dragesco-Kernéis, 1986, p. 401 (DS).

S. polymorphus (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 98 (*Vorticella polymorpha*).

MTL: Kahl, 1932, p. 463 (DL); Pätsch, 1974, p. 46 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 405 (DS).

REM: The older name, *Stentor viridis* (Pallas, 1776), has been suggested as a *nomen oblitum* (Foissner, 1987a).

SLA & WEG: *Stentor polymorphus* O. F. Müller.

S. roeselii Ehrenberg, 1835, Abh. dt. Akad. Wiss., year 1835, p. 179.

MTL: Kahl, 1932, p. 464 (*S. roeseli*) (DL); Dragesco & Dragesco-Kernéis, 1986, p. 411 (*S. roeseli*) (DS).

REM: Often wrongly written '*Stentor roeseli*'.

SLA & WEG: *Stentor roeseli* Ehrenberg.

S. roeselii f. *stagnalis,* Šrámek-Hušek. I could not find the original reference to this species which is mentioned in the lists of Sládeček *et al.* (1981) and Wegl (1983).

Gen.: *Stichotricha* Perty, 1849

S. secunda Perty, 1849, Mitt. naturf. Ges. Bern, year 1849, p. 169.

MTL: Kahl, 1932, p. 559 (DL). – R!

REM: The species which Borror & Evans (1979) redescribe under this name is very likely not *S. secunda,* because it has 4 macronuclear segments. *Stichotricha secunda* and *S. aculeata* are mixed up in the key of Kahl (1932): *S. secunda with* zoochlorellae, *S. aculeata without* zoochlorellae. Redescription of *S. aculeata* in Foissner (1980c).

Gen.: *Stokesia* Wenrich, 1929

S. vernalis Wenrich, 1929, Trans. Am. microsc. Soc., v. 48, p. 229.

MTL: Kahl, 1931, p. 311 (DL); Dragesco, 1966, p. 78 (DS).

REM: Nomenclature see Foissner (1987a). Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 5 5 – –; – 3 7 – –).

SLA: *Stokesia vernalis* (Wang) Wenrich.

Gen.: *Strobilidium* Schewiakoff, 1892 (Syn.: *Strombilidium,* Neave, Nomenclator Zoologicus, v. 6, p. 333; par lapsus)

S. caudatum (Fromentel, 1876), Études Microzoaires, p. 264 (*Strombidion c.*).

SYN: *Strombidium gyrans* Stokes, 1887, Jl. R. microsc. Soc., year 1887, p. 37.

MTL: Kahl, 1932, p. 510 (*Strobilidium gyrans*) (DL); Deroux, 1974, p. 571 (*Strobilidium gyrans*) (DS).

REM: Synonymy after Foissner (1987a). Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 6 4 – –; – 5 5 – –).

SLA: *Strobilidium gyrans* (Stokes).

WEG: *Strombilidium gyrans.*

S. humile Penard, 1922, Études Infusoires, p. 218.

MTL: Kahl, 1932, p. 512 (DL). – R!

WEG: *Strombilidium humile.*

Gen.: *Strombidinopsis* Kent, 1881

S. gyrans Kent, 1881, Manual infusoria II, p. 614.

MTL: Kahl, 1932, p. 515 (DL). – R!

REM: Complicated taxonomy and synonymy, which is best solved in the course of a redescription of the species (comp. Kahl, 1932 and Fauré-Fremiet, 1969). Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 6 4 – –; – 2 6 2 –).

Gen.: *Strombidium* Claparède & Lachmann, 1859 (Syn.: *Strombidion* Claparède & Lachmann, 1859; par lapsus).

S. viride Stein, 1867, Organismus des Infusionsthiere II, p. 163.

MTL: Kahl, 1932, p. 492 (DL). – R!

Gen.: *Strongylidium* Sterki, 1878

S. lanceolatum Kowalewski, 1882, Physiogr. Denkschr., v. 2, p. 405.

MTL: Kahl, 1932, p. 551 (DL). – R!

Gen.: *Stylonychia* Ehrenberg, 1830

Revision of genus: Hemberger (1982).

S. muscorum Kahl, 1932, Tierwelt Dtl., v. 25, p. 619.

MTL: Šrámek-Hušek, 1957, p. 23 (DL). – R!

S. mytilus complex [*S. mytilus* (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 87 (*Trichoda m.*)].

MTL: Kahl, 1932, p. 618 (DL); Hemberger, 1982, p. 227 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 486 (DS); Wirnsberger *et al.*, 1986, p. 167 (DS).

REM: See chapter 2. 2.! The species of this complex are common in running and stagnant waters, but avoid activated sludge.

SLA & WEG: *Stylonychia mytilus* Ehrenberg.

S. pustulata (O. F. Müller, 1786), Animalcula Infusoria, p. 246 (*Kerona p.*).

SYN: *Stylonychia notophora* Stokes, 1885, Ann. Mag. nat. Hist., v. 15, p. 446.

MTL: Kahl, 1932, p. 619 (DL); Hemberger, 1982, p. 239 (DS); Wirnsberger *et al.*, 1985a, p. 262 (DS).

REM: Synonymy after Wirnsberger *et al.* (1985a). Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies for *S. pustulata* and *S. notophora* (– – 10 – –; – – 7 3 –).

SLA & WEG: *Stylonychia notophora* Stokes and *Stylonychia pustulata* Ehrenberg.

S. putrina Stokes, 1885, Am. mon. microsc. J., v. 6, p. 187.

MTL: Kahl, 1932, p. 619 (DL); Pätsch, 1974, p. 63 (DS); Hemberger, 1982, p. 241 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 487 (DS).

S. vorax Stokes, 1885, Am. mon. microsc. J., v. 6, p. 188.

MTL: Kahl, 1932, p. 619 (DL); Hemberger, 1982, p. 242; Wirnsberger *et al.*, 1985a, p. 261 (DS).

Gen.: *Suctorella* Frenzel, 1891

Revision of genus: Jankowski (1981).

S. collini (Root, 1914), Arch. Protistenk., v. 35, p. 164 (*Podophrya c.*).

MTL: Kormos, 1935, p. 152 (*Prodiscophrya c.*) (DL); Jankowski, 1981, p. 111, 115 (DL). – R!

SLA & WEG: *Podophrya collinii* Root.

Gen.: *Supraspathidium* Foissner & Didier, 1981

S. vermiforme (Penard, 1922), Études Infusoires, p. 26 (*Spathidium v.*).

MTL: Kahl, 1930, p. 162 (*Spathidium v.*) (DL). – R!

WEG: *Spathidium vermiforme.*

Gen.: *Tachysoma* Stokes, 1887

Revision of genus: Hemberger (1982).

T. furcatum Kahl, 1932, Tierwelt Dtl., v. 25, p. 605 (*T. furcata*).

MTL: Hemberger, 1982, p. 248 (DL). – R!

REM: Sládeček *et al.* (1981) give (par lapsus?) s=p–i.

T. pellionellum (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 80 (*Trichoda pellionella*).

MTL: Kahl, 1932, p. 606 (*T. pellionella*); Pätsch, 1974, p. 65 (*T. pellionella*) (DS); Foissner & Didier, 1981, p. 259 (*T. pellionella*) (DS); Hemberger, 1982, p. 243 (*T. pellionella*) (DS).

REM: On superficial investigation easily confused with *Holosticha danubialis* Kaltenbach, 1960. This species, however, has its contractile vacuole located in the posterior third of the body and has short (3 μm) dorsal cilia (Foissner, 1987a). Common in running waters, rare in activated sludge.

Gen.: *Tetrahymena* Furgason, 1940

Revision of genus: Corliss (1973).

T. pyriformis complex [*T. pyriformis* (Ehrenberg, 1830, Abh. dt. Akad. Wiss., year 1830, p. 76 (*Leucophrys p.*)].

SYN: *Glaucoma pyriformis* and many others (see Corliss & Dougherty, 1967); *Sathrophilus oviformis* (Kahl, 1926), Arch. Protistenk., v. 55, p. 340 (*Saprophilus o.*).

MTL: Corliss, 1973, p. 13 (DS); Foissner, 1974, p. 45 (DS); Pätsch, 1974, p. 29 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 293 (DS).

REM: See chapter 2. 2.! Synonymy of *Sathrophilus oviformis* after Kahl (1935, p. 834). This species complex occurs frequently in heavily and very heavily polluted waters. It is easily confused with some other species of the genus, e.g. *Tetrahymena rostrata* Kahl, 1926, which has, however, a short caudal cilium (easily overlooked!) and which occurs only in cleaner waters and in terrestrial biotopes (Foissner, 1987a, d). Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies for *Sathrophilus oviformis* and *Tetrahymena pyriformis* (– – 3 7 –; – – – – 10).

SLA & WEG: *Sathrophilus oviformis* (Kahl) Corliss and *Tetrahymena pyriformis* (Ehrenberg), syn. *Glaucoma pyriformis.*

Gen.: *Thuricola* Kent, 1881.

Revision of genus: Trueba (1980).

T. folliculata Kent, 1881, Manual infusoria II, p. 718.

MTL: Kahl, 1935, p. 785 (DL); Eperon, 1980, p. 549 (DS); Trueba, 1980, p. 132 (DL).

REM: Sládeček *et al.* (1981) wrongly give *Cothurnia crystallina* Ehrenberg as a synonym of *T. folliculata.* But *C. crystallina* is a valid species of the genus *Vaginicola* (Kahl, 1935, p. 762). The *C. crystallina* Ehrenberg, which Penard (1922, p. 286) has described earlier as a new species, *C. regalis,* is indeed synonymous with *T. folliculata.* Müller (1786) is generally cited as describer of *T. folliculata.* He found, however, his *Vorticella folliculata* as an epizoon of *Cyclops,* where later investigators never found a *Thuricola* species. Thus, I follow the suggestion of Trueba (1980) to credit Kent (1881) with this species.

T. kellicottiana (Stokes, 1887), Proc. Am. phil. Soc., v. 24, p. 251 (*Thuricolopsis Kellicottiana*).

MTL: Kahl, 1935, p. 785 (DL); Trueba, 1980, p. 131 (DL). – R!

T. vasiformis Hammann, 1952, Arch. Hydrobiol., v. 47, p. 219.

MTL: Trueba, 1980, p. 130 (DL). – R!

Gen.: *Tillina* Gruber, 1879

T. magna Gruber, 1879, Zool. Anz., v. 2, p. 519.

MTL: Kahl, 1931, p. 282 (DL); Lynn, 1976a, p. 629 (DS); Foissner, 1985c, p. 257 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 248 (DS).

Gen.: *Tintinnidium* Kent, 1881

T. fluviatile (Stein, 1863), Amtl. Ber. Dt. Naturf. u. Aerzte, v. 37, p. 161 (*Tintinnus f.*)

SYN: *Tintinnidium fluviatile* var. *emarginatum* Maskell, 1887, Trans. Proc. N. Z. Inst., v. 20, p. 11.

MTL: Kahl, 1932, p. 516 (DL); Foissner & Wilbert, 1979, p. 94, 100 (DS); Bernatzky *et al.,* 1981, p. 82.

REM: Synonymy see Foissner & Wilbert (1979). Sládeček *et al.* (1981) and Wegl (1983) give slightly different saprobic valencies for *T. fluviatile* and *T. fluviatile* var. *emarginatum* (– 6 4 – –; – 3 7 – –).

SLA & WEG: *Tintinnidium fluviatile* Stein and *Tintinnidium fluviatile* var. *emarginatum* Maskell.

Gen.: *Tintinnopsis* Stein, 1867

T. cylindrata Kofoid & Campbell, 1929, Univ. Calif. Publs. Zool. v. 34, p. 33.

MTL: Kahl, 1932, p. 517 (DL); Foissner & Wilbert, 1979, p. 97, 100 (DS); Bernatzky et al., 1981, p. 82.

REM: *Nomen novum* of Kofoid & Campbell (1929) pro *T. cylindrica* Daday, 1892, Természetr. Füz., v. 15, p. 201.

Gen.: *Tokophrya* Bütschli, 1889

T. carchesii (Claparède & Lachmann, 1859), Mém. Inst. natn. génev., v. 6, p. 382 (*Podophrya c.*).

MTL: Collin, 1912, p. 335 (DL); Matthes, 1971, p. 273 (DL).

REM: Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies for *Podophrya carchesii* and *Tokophrya carchesii,* although these are objective synonyms (– – 3 4 3; – – 4 6 –). This species parasitizes exclusively on colonial peritrichs, especially on *Carchesium polypinum.*

SLA & WEG: *Podophrya carchesii* Claparède et Lachmann and *Tokophrya carchesii* (Claparède et Lachmann).

T. infusionum (Stein, 1859), Organismus der Infusionsthiere I, p. 48 (*Acineta i.*).

MTL: Collin, 1912, p. 311 (DL); Guilcher, 1951, p. 107 (DS); Millecchia & Rudzinska, 1968, p. 665 (DL); Hascall & Rudzinska, 1970, p. 311 (DS).

T. lemnarum (Stein, 1859), Organismus der Infusionsthiere I, p. 42 (*Acineta l.*).

SYN: *Podophrya mollis* Kent, 1882, Manual infusoria II, p. 821.

MTL: Collin, 1912, p. 333 (DL); Noble, 1932, p. 477 (DL); Nozawa, 1939, p. 261 (DL); Oppenheim, 1976, p. 10 (DL).

REM: Synonymy after Collin (1912). Wegl (1983) gives slightly different saprobic valencies for *T. lemnarum* and its synonym *T. mollis* (– – 5 5 –; – – 1 7 2).

SLA: *Tokophrya mollis* Bütschli.

WEG: *Tokophrya lemnarium* and *Tokophrya mollis.*

T. quadripartita (Claparède & Lachmann, 1859), Mém. Inst. natn. génev., v. 6, p. 382 (*Podophrya q.*).

MTL: Filipjev, 1910, p. 117 (DL); Collin, 1912, p. 331 (DL); Guilcher, 1951, p. 108 (DS); Oppenheim, 1976, p. 9 (DL).

SLA: *Tokophrya quadripartita* Claparède et Lachmann.

Gen.: *Trachelius* Schrank, 1803
T. ovum (Ehrenberg, 1831), Abh. dt. Akad. Wiss., year 1831, p. 112 (*Ophryocerca o.*).
MTL: Kahl, 1931, p. 210 (DL); Dragesco & Dragesco-Kernéis, 1986, p. 167 (DS).
SLA: *Trachelius ovum* Ehrenberg.

Gen.: *Trachelophyllum* Claparède & Lachmann, 1859
T. apiculatum (Perty, 1852), Zur Kenntniss kleinster Lebensformen, p. 151 (*Trachelius apiculatus*).
MTL: Kahl, 1930, p. 115 (DL); Foissner, 1983, p. 69 (DS); Foissner, 1984a, p. 50 (DS).
SLA: *Trachelophyllum apiculatum* Perty.
T. brachypharynx Levander, 1894, Acta Soc. Fauna Flora fenn., v. 9, p. 66.
MTL: Kahl, 1930, p. 115 (DL). – R!
T. pusillum (Perty, 1852), Zur Kenntniss kleinster Lebensformen, p. 151 (*Trachelius pusillus*).
MTL: Kahl, 1930, p. 115 (DL). – R!
REM: Sládeček *et al.* (1981) and Wegl (1983) give very different saprobic valencies for *Trachelophyllum pusillum* and its objective synonym, *Trachelius pusillus* (– – 3 3 4; – – 7 3 –).
SLA & WEG: *Trachelophyllum pusillum* Perty – Claparède et Lachmann and *Trachelius pusillum* Claparède et Lachmann.

Gen.: *Trichodina* Ehrenberg, 1830
Revision of genus: Haider (1964).
T. pediculus Ehrenberg, 1831, Abh. dt. Akad. Wiss., year 1831, p. 98.
MTL: Kahl, 1935, p. 658 (DL); Haider, 1964, p. 128 (DL); Pätsch, 1974, p. 44 (DS).
REM: Nomenclature see Foissner (1987a). Although a characteristic epizoon of *Hydra* spp., this species may be found in plankton samples, because single individuals are easily removed from their hosts.
SLA: *Trichodina pediculus* (O. F. Müller) Ehrenberg.

Gen.: *Trichospira* Roux, 1899
T. inversa (Claparède & Lachmann, 1859), Mém. Inst. natn. génev., v. 6, p. 267 (*Paramecium inversum*).
SYN: *Trichospira dextrorsa* Roux, 1899, Revue suisse Zool., v. 6, p. 584.
MTL: Klein, 1930, p. 264 (*T. dextrorsa*) (DS); Kahl, 1931, p. 262 (DL). – R!
REM: Redescription and biometrical characterization of protargol silver impregnated cells is recommended. Very rare species of uncertain familiar position.
SLA: *Trichospira inversa* Claparède et Lachmann.

Gen.: *Trimyema* Lackey, 1925
Revision of genus: Augustin *et al.* (1987).
T. compressum Lackey, 1925, New Jers. Agric. Exp. Stn. Bull., no 417, p. 34 (*T. compressa*).
MTL: Klein, 1930, p. 276 (*Sciadostoma difficile*) (DS); Kahl, 1931, p. 260 (*Sciadostoma difficile*) and 1935, p. 829 (*T. compressum*) (DL); Foissner, 1974, p. 38 (DS); Augustin *et al.*, 1987, p. 209 (*T. compressa*) (DS).

Gen.: *Trithigmostoma* Jankowski, 1967
T. cucullulus (O. F. Müller, 1786), Animalcula Infusoria, p. 105 (*Kolpoda c.*).
MTL: Klein, 1927, p. 111 (*Chilodon cucullulus*) (DS); Kahl, 1931, p. 235 (*Chilodonella cucullulus*) (DL); Pätsch, 1974, p. 24 (*Chilodonella cucullulus*) (DS); Foissner, 1979e, p. 34 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 282 (DS); Foissner, 1987b (DS).
REM: There are many different ways of writing the name of this species, which was formerly assigned to the genus *Chilodonella.* Jankowski (1979b) thinks that the correct denomination is '*Trithigmostoma cucullus* (O. F. Müller)'. He has, however, mixed up *Kolpoda cucullus* O. F. Müller and *Kolpoda cucullulus* O. F. Müller. The first one is the generally accepted and from the graphs of Müller well recognizable *Colpoda cucullus,* a colpodide ciliate. On superficial observation, *T. cucullulus* is easily confused with *T. steinii* (Blochmann, 1895) and *Chlamydonella polonica* Foissner *et al.*, 1981.
SLA & WEG: *Chilodonella cucullulus* O. F. Müller.

Gen.: *Trochilia* Dujardin, 1841

T. minuta (Roux, 1901), Faune infusorienne, p. 49 (*Dysteropsis m.*).
MTL: Kahl, 1931, p. 249 (DL); Heuss & Wilbert, 1973, p. 32 (DS); Foissner, 1979d, p. 562 (DS).
REM: Interesting morphologic and ecologic data in Heuss & Wilbert (1973). These data suggest that *T. minuta* is an alpha- to beta-mesosaprobic organism. Common, especially in *Sphaerotilus* flakes.
SLA: *Trochilia minuta* Roux.
T. salina (Entz, 1879), Természetr. Füz., v. 3, p. 52 (*Ervilia s.*).
MTL: Kahl, 1931, p. 249 (DL). – R!
SLA: *Trochilia salina* Stein.

Gen.: *Trochilioides* Kahl, 1931
T. recta (Kahl, 1928), Arch. Hydrobiol., v. 19, p. 85 (*Trochilia r.*).
MTL: Kahl, 1931, p. 247 (DL); Borror, 1972a, p. 41 (DS). – R!
REM: The redescription of Borror (1972) is not detailed enough. Foissner (1985b) describes another species of this genus, which is rather common in moderately polluted running waters.

Gen.: *Tropidoatractus* Levander, 1894
T. acuminatus Levander, 1894, Acta Soc. Fauna Flora fenn., v. 9, p. 39.
MTL: Kahl, 1932, p. 429 (DL); Jankowski, 1964b, p. 222 (DL). – R!

Gen.: *Urocentrum* Nitzsch, 1827
U. turbo (O. F. Müller, 1786), Animalcula Infusoria, p. 123 (*Cercaria t.*).
MTL: Klein, 1927, p. 116 (DS); Kahl, 1931, p. 354 (DL); Fauré-Fremiet, 1954, p. 227 (DS); Fernandez-Galiano & Guinea, 1971, p. 321 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 331 (DS).
REM: Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– – 7 3 –; – – 5 5 –).

Gen.: *Uroleptus* Ehrenberg, 1831
Revision of genus: Hemberger (1982).
U. lamella Ehrenberg, 1831, Abh. dt. Akad. Wiss., year 1831, p. 117 (*U. Lamella*).
SYN: *Uroleptus rattulus* Stein, 1859, Organismus der Infusionsthiere I, p. 180.
MTL: Kahl, 1932, p. 549 (*U. rattulus*) (DL); Hemberger, 1982, p. 124 (DL). – R!
REM: I agree with the synonymy suggested by Borror (1972b). Redescription of Dragesco (1960) uncertain (Hemberger 1982).
SLA & WEG: *Uroleptus rattulus* Stein.
U. musculus (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 74 (*Trichoda m.*).
MTL: Kahl, 1932, p. 550 (DL); Hemberger, 1982, p. 122 (DL). – R!
U. piscis (O. F. Müller, 1773), Vermium Terrestrium et Fluviatilium, p. 73 (*Trichoda p.*).
MTL: Kahl, 1932, p. 550 (DL); Hemberger, 1982, p. 125 (DL). – R!

Gen.: *Uronema* Dujardin, 1841
U. marinum Dujardin, 1841, Zoophytes, p. 392 (*U. marina*).
MTL: Klein, 1928, p. 229 (*Loxocephalus* cf. *putrinus*) (DS); Kahl, 1931, p. 356 (DL); Thompson, 1964, p. 80 (DS); Dragesco & Dragesco-Kernéis, 1986, p. 345 (DS).
REM: Certainly often confused with *U. parduczi* Foissner, 1971, which is much more common in fresh-water.
U. parduczi Foissner, 1971, Arch. Protistenk., v. 113, p. 34 (DS).

Gen.: *Urostyla* Ehrenberg, 1830
Revision of genus: Hemberger (1982).
U. grandis Ehrenberg, 1830, Abh. dt. Akad. Wiss., year 1830, p. 43.
MTL: Kahl, 1932, p. 565 (DL); Jerka-Dziadosz, 1972, p. 75 (DS); Pätsch, 1974, p. 55 (DS); Hemberger, 1982, p. 78.

Gen.: *Urotricha* Claparède & Lachmann, 1859
U. agilis (Stokes, 1886), Ann. Mag. nat. Hist., v. 17, p. 110 (*Balanitozoon agile*).
MTL: Kahl, 1930b, p. 58 (DL); Foissner, 1979b, p. 119 (DS).
SLA & WEG: *Urostyla agilis* Stokes (par lapsus?).
U. armata Kahl, 1927, Arch. Protistenk., v. 60, p. 64.
MTL: Kahl, 1930b, p. 60 (DL); Foissner, 1985b, p. 211 (DS).
U. farcta Claparède & Lachmann, 1859, Mém. Inst.

natn. génev., v. 6, p. 314.
MTL: Kahl, 1930, p. 58 (DL); Dragesco *et al.*, 1974, p. 71 (DS).
REM: Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– – 4 6 –; – – 2 8 –).
U. globosa Schewiakoff, 1892, Verh. naturh.-med. Ver. Heidelb., v. 4, p. 553.
MTL: Kahl, 1930, p. 59 (DL). – R!
REM: Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– – 10 – –; – – 7 3 –).
U. ovata Kahl, 1926, Arch. Protistenk., v. 55, p. 206.
MTL: Kahl, 1930, p. 60 (DL); Foissner, 1979b, p. 120 (DS).
REM: Redescription is recommended.

Gen.: *Urozona* Schewiakoff, 1889
U. buetschlii Schewiakoff, 1889, Bibl. zool., v. 1, p. 45 (*U. bütschlii*).
MTL: Kahl, 1931, p. 355 (*U. bütschlii*) (DL); Grolière, 1975a, p. 97 (DS). Schmall, 1976, p. 17 (DS).
SLA & WEG: *Urozona bütschlii* Schewiakoff.

Gen.: *Vaginicola* Lamarck, 1816
V. crystallina Ehrenberg, 1830, Abh. dt. Akad. Wiss., year 1830, p. 41.
MTL: Kahl, 1935, p. 762 (DL). – R!
V. ingenita (O. F. Müller, 1786), Animalcula Infusoria, p. 219 (*Trichoda i.*).
MTL: Kahl, 1935, p. 762 (DL). – R!
SLA: *Vaginicola ingenita* O. F. Müller.
V. striata (Fromentel, 1876), Études Microzoaires, p. 247 (*Stylocola s.*).
MTL: Kahl, 1935, p. 767 (DL). – R!
SLA: *Vaginicola striata* Fromentel.
V. tincta Ehrenberg, 1830, Abh. dt. Akad. Wiss., year 1830, p. 41.
MTL: Kahl, 1935, p. 764 (DL). – R!

Gen.: *Vorticella* Linnaeus, 1767
Revision of genus: Noland & Finley (1931), Warren (1986).
V. aequilata Kahl, 1935, Tierwelt Dtl., v. 30, p. 725.
MTL: Warren, 1986, p. 11 (DL). – R!
V. alba Fromentel, 1876, Études Microzoaires, p. 234.
MTL: Kahl, 1935, p. 726 (DL); Warren, 1986, p. 11 (DL). – R!
REM: Probably only an ecoform of *V. microstoma* or *V. infusionum.*
V. campanula Ehrenberg, 1831, Abh. dt. Akad. Wiss., year 1831, p. 92.
MTL: Kahl, 1935, p. 722 (DL); Lom, 1964, p. 144 (DS); Foissner & Schiffmann, 1974, p. 500 (DS); Pätsch, 1974, p. 39 (DS); Warren, 1986, p. 15 (DL).
REM: Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 1 6 3 –; – 1 5 4 –).
V. campanulata Šrámek-Hušek, 1948, Čas. národ. Mus., v. 117, p. 179.
MTL: Warren, 1986, p. 17 (DL). – R!
REM: This species was established by Šrámek-Hušek (1948) as a *nomen novum* for the preoccupied *V. constricta* Kahl, 1933 (Ciliata libera et ectocommensalia, p. II.c 129). Šrámek-Hušek (1948) found it in a moderately polluted river, whereas Kahl (1933, 1935, p. 735; *V. marina*) discovered it in the Baltic Sea. I doubt whether they really belong to the same species. In addition, the name '*campanulata*' is a poor choice, because it must be changed again if Ehrenberg's *Vorticella convallaria* var. *campanulata* (Abh. dt. Akad. Wiss., year 1831, p. 92) should be raised to species rank.
SLA: *Vorticella campanulata* (Kahl) Šrámek-Hušek.
V. citrina O. F. Müller, 1773, Vermium Terrestrium et Fluviatilium, p. 114.
MTL: Kahl, 1935, p. 717 (DL); Albrecht, 1984, p. 154 (ecology); Warren, 1986, p. 53 (DL). – R!
REM: Several authors (see Warren 1986) consider this species as an ecoform of *V. convallaria.* It is, however, a 'good' species (unpubl. observations). Wegl (1983) gives different saprobic valencies for *V. citrina* and *V. convallaria citrina* (– – 8 2 –; – 3 7 – –).
SLA: *Vorticella convallaria citrina* O. F. Müller.
WEG: *Vorticella citrina* and *Vorticella convallaria citrina.*
V. communis Fromentel, 1876, Études Microzoaires, p. 238.
MTL: Kahl, 1935, p. 723 (DL); Warren, 1986, p. 18 (DL). – R!

V. convallaria (Linnaeus, 1758), Systema Naturae, v. 1, p. 817 (*Hydra c.*).

MTL: Kahl, 1935, p. 722 (DL); Pätsch, 1974, p. 39 (DS); Foissner, 1979a, p. 537 (DS); Warren, 1986, p. 18 (DL).

V. cupifera Kahl, 1935, Tierwelt Dtl., v. 30, p. 725.

MTL: Foissner & Schiffmann, 1974, p. 498 (DS); Warren, 1986, p. 54.

REM: Redescription of protargol silver stained cells is recommended.

V. elongata Fromentel, 1876, Études Microzoaires, p. 229.

MTL: Kahl, 1935, p. 719 (DL); Warren, 1986, p. 20 (DL). – R!

V. fromenteli Kahl, 1935, Tierwelt Dtl., v. 30, p. 716.

MTL: Warren, 1986, p. 21 (DL). – R!

V. hamatella Foissner, 1987, Arch. Protistenk., v. 133, p. 224

MTL: Warren 1986, p. 25 (*V. hamata*). – R!

REM: This species was established by Foissner (1987a) for *V. hamata* Ehrenberg, 1831, which is preoccupied. It is probably a further ecoform of *V. microstoma* or *V. infusionum.*

SLA & WEG: *Vorticella hamata* Ehrenberg.

V. hians O. F. Müller, 1773, Vermium Terrestrium et Fluviatilium, p. 125.

MTL: None. – R!

REM: Ehrenberg (1838) synonymizes this species with *V. convallaria.* Fauré-Fremiet (1905) and Stiller (1954) believe that it is an ecoform of *V. microstoma,* which is adapted to nutrient-rich nearly anaerobic water.

SLA & WEG: *Vorticella microstoma hians* Fauré-Fremiet.

V. marginata Stiller, 1931, Arb. ung. biol. ForschInst., v. 4, p. 178.

MTL: Kahl, 1935, p. 722 (DL); Warren, 1986, p. 31 (DL). – R!

V. mayeri Fauré-Fremiet, 1920, Bull. Soc. zool. Fr., v. 45, p. 103.

MTL: Kahl, 1935, p. 717 (DL); Warren, 1986, p. 31 (DL). – R!

REM: A very characteristic species in eutrophic lakes.

V. microstoma Ehrenberg, 1830, Abh. dt. Akad. Wiss., year 1830, p. 66.

SYN: *V. putrinum* Kent, 1881, Manual infusoria, p. 684 (non *V. putrina* O. F. Müller, 1776, Zoologiae Danicae Prodromus, p. 281).

MTL: Kahl, 1935, p. 729 (DL); Davidson & Finley, 1972, p. 8 (DS); Pätsch, 1974, p. 40 (DS); Warren, 1986, p. 33 (DL).

REM: The *V. putrina* of Müller (1776) has an acontractile stalk, indicating that it belongs to the Epistylididae or Operculariidae. Thus, the identification of Kent with a true *Vorticella* species from infusions must be rejected. This has already been recognized by Kahl (1935, p. 734). The species of Kent (1881) fall almost certainly into the range of variability of *V. microstoma* or *V. infusionum.* Recently, *V. putrina* Müller, 1776 has been transferred to the genus *Rhabdostyla* (Warren, 1986).

Vorticella microstoma is very common in polluted waters and is very likely highly variable. Foissner & Schiffman (1974) and Foissner (1979a) tried to separate it from *V. infusionum* Dujardin, 1841. This must, however, be proved further. At present, I tend to consider all this forms as members of a sibling species complex.

V. microstoma f. *elongata* Stiller, 1954, Annls. hist. – nat. Mus. natn. hung., v. 5, p. 195.

MTL: None. – R!

REM: Occurs in warm water.

V. microstoma f. *monilata* Stiller, 1954, Annls. hist. – nat. Mus. natn. hung., v. 5, p. 198.

MTL: None. – R!

REM: In soda waters. Jankowski (1976b) established a new species for it, *Pseudovorticella papillata.* This is, however, not justified, because Stiller (1954) noted that her form has a vorticellide silverline system. Thus, it is indeed and as Stiller (1954) suggested, an ecoform of *V. microstoma.*

V. microstoma f. *turgescens* Stiller, 1954, Annls. hist. – nat. Mus. natn. hung., v. 5, p. 192.

MTL: None. – R!

REM: According to Stiller (1954), this is the polysaprobic ecoform of *V. microstoma.*

V. natans (Fauré-Fremiet, 1924), Bull. biol. Fr. Belg., Suppl. 6, p. 149 (*Vorticella convallaria* var. *natans*).

MTL: Kahl, 1935, p. 717 (DL); Warren, 1986, p. 34 (DL). – R!

REM: A characteristic species in the lake plankton.

SLA: *Vorticella natans* Fauré-Fremiet.

V. nebulifera O. F. Müller, 1773, Vermium Terrestrium et Fluviatilium, p. 119.

MTL: Kahl, 1935, p. 720, 736 (DL). – R!

REM: This name should be used only for marine vorticellids which are morphologically similar to the fresh-water species *V. similis* (see Kahl 1935, p. 720, 736). Jankowski (1976b) transferred *V. nebulifera* to the genus *Pseudovorticella.* This is certainly an error. Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 7 3 – –; – 5 5 – –).

SLA: *Vorticella nebulifera* = syn. *V. convallaria similis* (Stokes) Noland.

V. nutans O. F. Müller, 1773, Vermium Terrestrium et Fluviatilium, p. 120.

MTL: Kahl, 1935, p. 721 (DL); Warren, 1986, p. 34 (DL). – R!

V. octava Stokes, 1885, Ann. Mag. nat. Hist., v. 15, p. 443.

MTL: Kahl, 1935, p. 727 (DL); Reid, 1967, p. 486 (DS). – R!

REM: In contrast to Noland & Finley (1931) and Warren (1986), I cannot recommend considering *V. octava* as a variety of the marine species *V. striata,* which is documented only by a single drawing (Dujardin, 1841, Zoophytes, p. 11, picture part!). The investigations of Reid (1967) should be continued on other populations.

V. picta (Ehrenberg, 1831), Abh. dt. Akad. Wiss., year 1831, p. 93 (*Carchesium pictum*).

MTL: Kahl, 1935, p. 721 (DL); Warren, 1986, p. 37 (DL). – R!

REM: Sládeček *et al.* (1981) and Wegl (1983) give different saprobic valencies (– 9 1 – –; – 2 6 2 –).

SLA: *Vorticella picta* Ehrenberg.

V. picta f. *longa* Nusch, 1970, Arch. Hydrobiol., Suppl. 37, p. 324.

MTL: None. – R!

V. similis Stokes, 1887, Am. mon. microsc. J., v. 8, p. 144.

MTL: Kahl, 1935, p. 720 (DL); Foissner & Schiffmann, 1975, p. 419 (DS); Foissner, 1981b, p. 40 (DS).

REM: *In vivo* nearly inseparable from *V. convallaria.* Biometric data of silver stained cells allow, however, a rather reliable discrimination (Foissner & Schiffmann, 1975; Foissner, 1981b).

SLA: *Vorticella convallaria similis* (Stokes) Noland and *Vorticella similis* = *V. convallaria similis* (Stokes) Noland.

V. telescopica Kent, 1881, Manual infusoria II, p. 677.

MTL: Kahl, 1935, p. 714 (DL); Warren 1986, p. 43 (DL). – R!

V. telescopioides Šrámek-Hušek, 1948, Čas. národ. Mus., v. 117, p. 175.

MTL: Warren, 1986, p. 44 (DL). – R!

REM: Šrámek-Hušek (1948) designated this species as '*Vorticella telescopioides* (Kahl) nom. nov.?'. This is not in accordance with the International Code of Zoological Nomenclature, because Kahl has not given a name to his variety of *V. telescopica* Kent, 1881. The naming of Šrámek-Hušek (1948) has, indeed, produced a new species.

SLA & WEG: *Vorticella telescopoides* (Kahl) Šrámek-Hušek.

V. vernalis Stokes, 1887, Am. mon. microsc. J., v. 8, p. 145.

MTL: Kahl, 1935, p. 730 (DL); Warren, 1986, p. 45 (DL). – R!

REM: Belongs probably to the genus *Pseudovorticella.*

V. vestita Stokes, 1883, Am. mon. microsc. J., v. 4, p. 208.

MTL: Kahl, 1935, p. 730 (DL); Warren, 1986, p. 45 (DL). – R!

REM: Belongs probably to the genus *Pseudovorticella* (see also Warren, 1987, p. 12). Reinvestigation of silver stained cells is necessary.

Gen.: *Zoothamnium* Bory de St. Vincent, 1826

Z. arbuscula (Ehrenberg, 1831), Abh. dt. Akad. Wiss., year 1831, p. 94 (*Zoocladium Arbuscula*).

MTL: Kahl, 1935, p. 745 (DL). – R!

SLA: *Zoothamnium arbuscula* Ehrenberg.

Z. asellicola Foissner, 1987, Arch. Protistenk., v. 133, p. 226.

MTL: Kahl, 1935, p. 745 (*Z. pygmeum*) (DL). – R!

REM: Foissner (1987a) established this new species for *Carchesium pygmeum* D'Udekem, 1864, which is certainly not identical with the *C. pygmeum* of Ehrenberg (1838). This has already

been noted by Kahl (1935, p. 745).

SLA & WEG: *Zoothamnium pygmaeum* D'Udekem.

Z. hentscheli Kahl, 1935, Tierwelt Dtl., v. 30, p. 747, MTL: None. – R!

Z. mucedo Entz, 1884, Mitt. zool. Stn. Neapel, v. 5, p. 418.

MTL: Kahl, 1935, p. 749 (DL). – R!

Z. procerius Kahl, 1935, Tierwelt Dtl., v. 30, p. 747. MTL: None. – R!

5. Revised list of ciliates as indicators of saprobity (Table 1)

Table 1. Revised list of ciliates as indicators of saprobity.

Species	s	Saprobic valency					I	SI
		x	o	b	a	p		
Acineria incurvata Dujardin, 1841	p-i	–	–	–	+	10	5	4.0E
Acineria uncinata Tucolesco, 1962	a-p	–	–	2	4	4	2	3.2
Acineta flava Kellicott, 1885	b	–	1	7	2	–	3	2.1
Acineta grandis Kent, 1882	b-a	–	–	4	6	–	3	2.6
Acineta tuberosa (Pallas, 1766)	a	–	–	1	6	3	3	3.2
Acineta sp.	a-b	–	–	4	5	1	2	2.7
Acinetides lacustris (Stokes, 1886)	p-a	–	–	+	4	6	3	3.6
Actinobolina radians (Stein, 1867)	b	–	1	7	2	–	3	2.1
Actinobolina vorax (Wenrich, 1929)	o	–	7	3	–	–	4	1.3
Amphileptus carchesii Stein, 1867	a	–	–	1	8	1	4	3.0
Amphileptus claparedii Stein, 1867	a	–	–	2	8	+	4	2.8
Amphileptus meleagris (Ehrenberg, 1835)	a	–	–	–	10	–	5	3.0
Amphileptus pleurosigma (Stokes, 1884)	b-a	–	+	5	5	–	3	2.5
Amphileptus punctatus (Kahl, 1926)	a	–	–	1	9	–	5	2.9
Amphileptus rotundus (Kahl, 1926)	a	–	–	1	8	1	4	3.0
Amphileptus trachelioides (Zacharias, 1894)	o	–	7	3	–	–	4	1.3
Amphileptus sp.	a	–	1	2	6	1	1	2.7
Askenasia volvox (Eichwald, 1852)	b	–	1	6	3	–	3	2.2
Aspidisca cicada (O.F. Mueller, 1786)	a	–	–	2	8	–	4	2.8
Aspidisca lynceus (O.F. Mueller, 1773)	a	–	+	1	9	–	5	2.9
Aspidisca turrita (Ehrenberg, 1831)	a-b	–	–	4	6	–	3	2.6
Aspidisca sp.	a-b	–	–	4	6	–	3	2.6
Astylozoon fallax Engelmann, 1862	b-a	–	–	5	5	–	3	2.5
Astylozoon faurei Kahl, 1935	a	–	–	–	9	1	5	3.1
Blepharisma coeruleum Gajevskaja, 1927	b	–	2	8	–	–	4	1.8
Blepharisma lateritium (Ehrenberg, 1831)	b	–	2	8	+	–	4	1.8
Bothrostoma undulans (Stokes, 1887)	p-i	–	–	–	–	10	5	4.0E
Brachonella spiralis (Smith, 1897)	p-i	–	–	–	–	10	5	4.0E
Bursaria truncatella O.F. Mueller, 1773	b	–	–	8	2	–	4	2.2
Bursaridium pseudobursaria (Fauré-Fremiet, 1924)	o-b	–	6	4	–	–	3	1.4
Bursellopsis spumosa (Schmidt, 1921)	o	–	7	3	–	–	4	1.3
Caenomorpha lauterborni Kahl, 1927	p-i	–	–	–	–	10	5	4.0E
Caenomorpha medusula Perty, 1852	p-i	–	–	–	–	10	5	4.0E
Caenomorpha sapropelica Kahl, 1927	p-i	–	–	–	–	10	5	4.0E
Caenomorpha uniserialis Levander, 1894	p-i	–	–	–	–	10	5	4.0E
Caenomorpha sp.	p-i	–	–	–	–	10	5	4.0E
Calyptotricha lanuginosa (Penard, 1922)	a	–	–	3	7	–	4	2.7
Campanella umbellaria (Linnaeus, 1758)	b-a	–	–	5	5	–	3	2.5

Table 1. (Continued).

Species	s	Saprobic valency					I	SI
		x	o	b	a	p		
Carchesium pectinatum (Zacharias, 1897)	o-b	–	6	4	–	–	3	1.4
Carchesium polypinum (Linnaeus, 1758)	a	–	–	2	7	1	3	2.9
Carchesium sp.	a	–	1	1	6	2	1	2.9
Chaenea limicola Lauterborn, 1901	p	–	–	–	–	10	5	4.0
Chaenea teres (Dujardin, 1841)	b	–	–	7	3	–	4	2.3
Chaenea vorax Quennerstedt, 1867	b	–	–	10	–	–	5	2.0
Chaetospira muelleri Lachmann, 1856	b	–	1	8	1	–	4	2.0
Chaetospira remex (Hudson, 1875)	a	–	–	3	7	–	4	2.7
Chilodonella uncinata (Ehrenberg, 1838)	a	–	–	2	6	2	3	3.0
Chilodontopsis depressa (Perty, 1852)	b	–	1	7	2	–	3	2.1
Chilodontopsis muscorum Kahl, 1931	a	–	–	–	10	–	5	3.0
Chilodontopsis vorax (Stokes, 1887)	b-a	–	–	5	5	–	3	2.5
Cinetochilum margaritaceum (Ehrenberg, 1831)	b-p	–	1	3	3	3	1	2.8
Climacostomum virens (Ehrenberg, 1838)	b	–	–	10	–	–	5	2.0
Codonella cratera (Leidy, 1877)	o-b	–	6	4	–	–	3	1.4
Cohnilembus verminus (O.F. Mueller, 1786)	a-b	–	–	4	6	–	3	2.6
Cohnilembus vexillarius (Kahl, 1926)	b	–	–	10	–	–	5	2.0
Cohnilembus sp.	b-a	–	–	5	5	–	3	2.5
Coleps bicuspis Noland, 1925	b	–	–	7	3	–	4	2.3
Coleps hirtus (O.F. Mueller, 1786)	b-a	–	+	5	5	+	3	2.5
Coleps sp.	a-b	–	–	4	6	–	3	2.6
Colpidium campylum (Stokes, 1886)	p-i	–	–	–	1	9	5	3.9E
Colpidium colpoda (Losana, 1829)	p-i	–	–	–	2	8	4	3.8E
Colpidium kleini Foissner, 1969	p	–	–	–	3	7	4	3.7
Colpidium truncatum Stokes, 1885	a	–	–	2	6	2	3	3.0
Colpidium sp.	p-i	–	–	–	3	7	4	3.7E
Colpoda cucullus (O.F. Mueller, 1773)	p-a	–	–	–	4	6	3	3.6
Colpoda inflata (Stokes, 1885)	a-p	–	–	–	5	5	3	3.5
Condylostoma vorticella (Ehrenberg, 1833)	b	–	3	6	1	–	3	1.8
Cothurnia annulata Stokes, 1885	o-b	–	6	4	–	–	3	1.4
Cristigera media Kahl, 1928	p-i	–	–	–	–	10	5	4.0E
Ctedoctema acanthocrypta Stokes, 1884	b	–	1	8	1	–	4	2.0
Cyclidium citrullus (Cohn, 1866)	a	–	–	1	8	1	4	3.0
Cyclidium elongatum (Schewiakoff, 1889)	b-a	–	–	5	5	–	3	2.5
Cyclidium glaucoma O.F. Mueller, 1773	a	–	–	–	9	1	5	3.1
Cyclidium heptatrichum Schewiakoff, 1893	b	–	–	8	2	–	4	2.2
Cyclidium oblongum Kahl, 1931	a-b	–	–	4	6	–	3	2.6
Cyclidium singulare (Kahl, 1926)	a	–	–	–	10	–	5	3.0
Cyclidium versatile Penard, 1922	a-b	–	2	3	5	–	2	2.3
Cyclidium sp.	a-b	–	–	4	6	–	3	2.6
Cyrtolophosis mucicola Stokes, 1885	a-p	–	–	–	5	5	3	3.5
Dendrosoma radians Ehrenberg, 1838	b-a	–	–	5	5	–	3	2.5
Dexiotricha plagia Stokes, 1885	a	–	–	2	6	2	3	3.0
Dexiotrichides centralis (Stokes, 1885)	p-i	–	–	–	–	10	5	4.0E
Didinium cinctum Voigt, 1902	o	–	8	2	–	–	4	1.2
Didinium nasutum (O.F. Mueller, 1773)	b-a	–	2	4	4	–	2	2.2
Dileptus conspicuus Kahl, 1931	a	–	–	–	10	–	5	3.0
Dileptus gigas (Claparède & Lachmann, 1859)	b	–	–	7	3	–	4	2.3
Dileptus margaritifer (Ehrenberg, 1833)	b-o	–	4	6	–	–	3	1.6
Dileptus monilatus (Stokes, 1886)	b	–	–	7	3	–	4	2.3
Dileptus sp.	a	–	1	3	6	–	2	2.5

Table 1. (Continued).

Species	s	Saprobic valency					I	SI
		x	o	b	a	p		
Discomorphella lauterborni (Wetzel, 1928)	p-i	–	–	–	–	10	5	4.0E
Discomorphella pectinata (Levander, 1894)	p-i	–	–	–	–	10	5	4.0E
Disematostoma buetschlii Lauterborn, 1894	b	–	1	7	2	–	3	2.1
Disematostoma tetraedricum (Fauré-Fremiet, 1924)	b	–	–	10	–	–	5	2.0
Drepanomonas dentata Fresenius, 1858	o	–	8	2	–	–	4	1.2
Drepanomonas revoluta Penard, 1922	a-p	–	–	–	5	5	3	3.5
Dysteria fluviatilis (Stein, 1859)	b	–	–	8	2	–	4	2.2
Enchelyodon elegans (Kahl, 1926)	a	–	–	–	10	–	5	3.0
Enchelyodon fusidens Kahl, 1930	a	–	–	–	10	–	5	3.0
Enchelyomorpha vermicularis (Smith, 1899)	p-m	–	–	–	–	10	5	4.0E
Enchelys gasterosteus Kahl, 1926	b-a	–	–	5	5	–	3	2.5
Enchelys pupa (O.F. Mueller, 1786)	b-a	–	–	5	5	–	3	2.5
Epalxella antiquorum (Penard, 1922)	p-i	–	–	–	–	10	5	4.0E
Epalxella bidens (Kahl, 1932)	p-i	–	–	–	–	10	5	4.0E
Epalxella mirabilis (Roux, 1899)	p-i	–	–	–	–	10	5	4.0E
Epalxella striata (Kahl, 1926)	p-i	–	–	–	–	10	5	4.0E
Epalxella sp.	p-i	–	–	–	–	10	5	4.0E
Epenardia myriophylli (Penard, 1922)	a-b	–	–	4	6	–	3	2.6
Epistylis coronata Nusch, 1970	a	–	–	–	10	–	5	3.0
Epistylis digitalis (Linnaeus, 1758)	o-b	–	5	5	–	–	3	1.5
Epistylis galea Ehrenberg, 1831	a	–	–	3	7	–	4	2.7
Epistylis hentscheli Kahl, 1935	b-a	–	–	5	5	–	3	2.5
Epistylis nympharum Engelmann, 1862	o-a	–	3	4	3	–	2	2.0
Epistylis plicatilis Ehrenberg, 1831	a	–	–	1	7	2	3	3.1
Epistylis rotans Švec, 1897	o-b	–	5	5	–	–	3	1.5
Epistylis sp.	a	–	1	2	6	1	1	2.7
Euplotes aediculatus Pierson, 1943	a	–	–	1	9	–	5	2.9
Euplotes affinis (Dujardin, 1841)	b-a	–	+	6	4	–	3	2.4
Euplotes charon (O.F. Mueller, 1773)	b-a	–	–	6	4	–	3	2.4
Euplotes eurystomus (Wrześniowski, 1870)	a	–	–	2	6	2	3	3.0
Euplotes moebiusi Kahl, 1932	a	–	–	2	7	1	3	2.9
Euplotes patella (O.F. Mueller, 1773)	b	–	–	7	3	–	4	2.3
Euplotes sp.	a	–	–	2	6	2	3	3.0
Frontonia acuminata (Ehrenberg, 1833)	b	–	2	6	2	–	3	2.0
Frontonia atra (Ehrenberg, 1833)	b	–	–	10	–	–	5	2.0
Frontonia leucas (Ehrenberg, 1833)	b	–	1	6	3	–	3	2.2
Frontonia vesiculosa Da Cunha, 1913	b	–	1	6	3	–	3	2.2
Frontonia sp.	b	–	1	6	3	–	3	2.2
Gastronauta membranacea Buetschli, 1889	b	–	2	6	2	–	3	2.0
Gastrostyla steinii Engelmann, 1862	a	–	–	2	7	1	3	2.9
Glaucoma reniforme Schewiakoff, 1892	p	–	–	–	2	8	4	3.8
Glaucoma scintillans Ehrenberg, 1830	p-i	–	–	+	1	9	5	3.9E
Glaucoma sp.	p-a	–	–	1	4	5	2	3.4
Halteria chlorelligera (Kahl, 1932)	o	–	8	2	–	–	4	1.2
Halteria cirrifera (Kahl, 1932)	o-b	–	6	4	–	–	3	1.4
Halteria grandinella (O.F. Mueller, 1773)	b	–	1	7	2	–	3	2.1
Halteria sp.	b-a	–	2	5	3	–	2	2.1
Hastatella radians Erlanger, 1890	b	–	1	6	3	–	3	2.2
Heliophrya minima (Rieder, 1936)	b-a	–	–	5	5	–	3	2.5
Heliophrya rotunda (Hentschel, 1916)	b-a	–	–	5	5	–	3	2.5

Table 1. (Continued).

Species	s	Saprobic valency					I	SI
		x	o	b	a	p		
Hexotricha caudata Lackey, 1925	p-m	–	–	–	–	10	5	4.0E
Histriculus similis (Quennerstedt, 1867)	b-a	–	–	5	5	–	3	2.5
Histriculus vorax (Stokes, 1891)	a	–	–	–	10	–	5	3.0
Holophrya nigricans Lauterborn, 1894	b	–	–	10	–	–	5	2.0
Holosticha kessleri (Wrześniowski, 1877)	a-b	–	–	4	5	1	2	2.7
Holosticha mystacea (Stein, 1859)	p	–	–	–	3	7	4	3.7
Holosticha similis Stokes, 1886	a	–	–	1	8	1	4	3.0
Homalozoon vermiculare (Stokes, 1887)	b-a	–	–	6	4	–	3	2.4
Hypotrichidium conicum Ilowaisky, 1921	b-p	–	–	3	4	3	2	3.0
Kellicotta cuspidata (Kellicott, 1885)	b-a	–	–	5	5	–	3	2.5
Kerona pediculus (O.F. Mueller, 1773)	o-b	–	6	4	–	–	3	1.4
Lacrymaria olor (O.F. Mueller, 1786)	b	–	2	6	2	–	3	2.0
Lagenophrys labiata Stokes, 1877	o	1	6	3	–	–	3	1.2
Lagenophrys vaginicola Stein, 1851	o	–	9	1	–	–	5	1.1
Lagynophrya acuminata Kahl, 1935	o	–	8	2	–	–	4	1.2
Lagynus cucumis (Penard, 1922)	p	–	–	–	–	10	5	4.0
Lagynus elegans (Engelmann, 1862)	p-i	–	–	–	–	10	5	4.0E
Lembadion bullinum (O.F. Mueller, 1786)	b	–	–	9	1	–	5	2.1
Lembadion lucens (Maskell, 1887)	b	–	–	9	1	–	5	2.1
Lembadion magnum (Stokes, 1887)	b	–	2	8	–	–	4	1.8
Leptopharynx costatus Mermod, 1914	o-b	–	5	5	–	–	3	1.5
Litonotus anguilla (Kahl, 1931)	b-a	–	–	5	5	–	3	2.5
Litonotus carinatus Stokes, 1885	b-a	–	–	5	5	–	3	2.5
Litonotus crystallinus (Vuxanovici, 1960)	b-a	–	–	5	5	–	3	2.5
Litonotus cygnus (O.F. Mueller, 1773)	b	–	–	10	–	–	5	2.0
Litonotus fasciola (O.F. Mueller, 1773)	a	–	–	1	8	1	4	3.0
Litonotus fusidens (Kahl, 1926)	b-p	–	–	3	4	3	2	3.0
Litonotus hirundo (Penard, 1922)	a	–	–	1	8	1	4	3.0
Litonotus lamella (O.F. Mueller, 1773)	a	–	–	2	8	–	4	2.8
Litonotus procerus (Penard, 1922)	o-b	–	5	5	–	–	3	1.5
Litonotus varsaviensis Wrześniowski, 1870	b-a	–	–	5	5	–	3	2.5
Litonotus varsaviensis f. *polysaprobica* Šrámek-Hušek, 1954	p-i	–	–	–	1	9	5	3.9E
Litonotus sp.	a	–	–	1	7	2	3	3.1
Loxocephalus granulosus Kent, 1881	a	–	–	2	8	–	4	2.8
Loxocephalus luridus Eberhard, 1862	a	–	–	–	10	–	5	3.0
Loxodes magnus Stokes, 1887	p	–	–	–	3	7	4	3.7
Loxodes rostrum (O.F. Mueller, 1773)	a-b	–	–	4	6	–	3	2.6
Loxodes striatus (Engelmann, 1862)	a	–	–	1	6	3	3	3.2
Loxodes sp.	b-p	–	–	2	5	3	2	3.1
Loxophyllum helus (Stokes, 1884)	b	–	–	10	–	–	5	2.0
Loxophyllum meleagris (O.F. Mueller, 1773)	b	–	–	8	2	–	4	2.2
Loxophyllum utriculariae (Penard, 1922)	b	–	1	8	1	–	4	2.0
Loxophyllum sp.	b	–	1	6	3	–	3	2.2
Marituja pelagica Gajevskaja, 1928	o	–	10	–	–	–	5	1.0
Mesodinium acarus Stein, 1863	b	–	–	7	3	–	4	2.3
Mesodinium cinctum Calkins, 1902	b	–	–	6	3	1	3	2.5
Mesodinium pulex (Claparède & Lachman, 1859)	b	–	2	6	2	–	3	2.0
Mesodinium sp.	b	–	1	6	3	–	3	2.2
Metacineta mystacina (Ehrenberg, 1831)	b-a	–	–	5	5	–	3	2.5
Metopus contortus (Quennerstedt, 1867)	p-i	–	–	–	–	10	5	4.0E

Table 1. (Continued).

Species	s	Saprobic valency					I	SI
		x	o	b	a	p		
Metopus es (O.F. Mueller, 1776)	p-i	–	–	–	1	9	5	3.9E
Metopus fuscus Kahl, 1927	p-i	–	–	–	–	10	5	4.0E
Metopus ovalis Kahl, 1927	p-i	–	–	–	–	10	5	4.0E
Metopus spinosus Kahl, 1927	p-i	–	–	–	–	10	5	4.0E
Metopus striatus McMurrich, 1884	p-i	–	–	–	–	10	5	4.0E
Metopus sp.	p-i	–	–	–	1	9	5	3.9E
Microthorax pusillus Engelmann, 1862	a	–	–	2	8	–	4	2.8
Microthorax sulcatus Engelmann, 1862	b	–	–	10	–	–	5	2.0
Monodinium balbianii Fabre-Domergue, 1888	b-o	–	4	5	1	–	2	1.7
Mucophrya pelagica Gajevskaja, 1928	o	–	10	–	–	–	5	1.0
Multifasciculatum elongatum (Claparède & Lachmann, 1859)	a	–	–	1	9	–	5	2.9
Myrionecta rubra (Lohmann, 1908)	o	–	10	–	–	–	5	1.0
Nassula flava Claparède & Lachmann, 1859	a-b	–	–	4	6	–	3	2.6
Nassula gracilis Kahl, 1931	a	–	–	2	8	–	4	2.8
Nassula ornata Ehrenberg, 1833	b-a	–	–	5	5	–	3	2.5
Nassula sp.	a	–	–	3	6	1	3	2.8
Nassulopsis elegans (Ehrenberg, 1833)	b	–	1	8	1	–	4	2.0
Obertrumia aurea (Ehrenberg, 1833)	b-a	–	–	6	4	–	3	2.4
Opercularia allensi Stokes, 1877	a	–	1	2	6	1	2	2.7
Opercularia coarctata (Claparède & Lachmann, 1858)	a	–	–	2	7	1	3	2.9
Opercularia confusa Stiller, 1940	o-b	–	5	5	–	–	3	1.5
Opercularia curvicaulis (Penard, 1922)	a	–	–	–	10	–	5	3.0
Opercularia microdiscus Fauré-Fremiet, 1904	a	–	–	–	10	–	5	3.0
Opercularia minima Kahl, 1935	a	–	–	–	10	–	5	3.0
Opercularia nutans (Ehrenberg, 1831)	b	–	–	7	3	–	4	2.3
Opercularia phryganeae Kahl, 1935	a-p	–	–	–	5	5	3	3.5
Opercularia ramosa Stokes, 1889	a	–	–	–	8	2	4	3.2
Opercularia stenostoma Stein, 1854	b	–	1	7	2	–	3	2.1
Opercularia sp.	a	–	–	2	6	2	2	3.0
Ophrydium crassicaule Penard, 1922	b-a	–	–	5	5	–	3	2.5
Ophrydium sessile Kent, 1882	a-b	–	2	3	5	–	2	2.3
Ophrydium versatile (O.F. Mueller, 1786)	o	–	8	2	–	–	4	1.2
Ophrydium sp.	b-a	–	2	4	4	–	2	2.2
Ophryoglena atra Lieberkuehn, 1856	b	–	–	10	–	–	5	2.0
Ophryoglena flava (Ehrenberg, 1833)	b	–	–	10	–	–	5	2.0
Ophryoglena oblonga Gajevskaja, 1927	b	–	2	8	–	–	4	1.8
Opisthonecta henneguyi Fauré-Fremiet, 1906	b-p	–	–	3	4	3	2	3.0
Oxytricha aeruginosa Wrześniowski, 1870	b	–	–	10	–	–	5	2.0
Oxytricha chlorelligera Kahl, 1932	a	–	–	–	10	–	5	3.0
Oxytricha fallax Stein, 1859	a	–	–	1	8	1	4	3.0
Oxytricha ludibunda Stokes, 1891	p	–	–	–	2	8	4	3.8
Oxytricha saprobia Kahl, 1932	a-p	–	–	–	6	4	3	3.4
Oxytricha setigera Stokes, 1891	a-b	–	–	4	6	–	3	2.6
Oxytricha similis Engelmann, 1862	b-a	–	–	5	5	–	3	2.5
Oxytrichidae Gen. & sp.	a-b	–	–	4	4	2	2	2.8
Papillorhabdos carchesii Foissner, 1984	a	–	–	2	7	1	3	2.9
Paracolpoda steinii (Maupas, 1883)	p	–	–	–	2	8	4	3.8
Paradileptus elephantinus (Švec, 1897)	b	–	3	6	1	–	3	1.8
Paramecium aurelia complex	b-a	–	–	5	5	–	3	2.5
Paramecium bursaria (Ehrenberg, 1831)	b	–	–	7	3	+	4	2.3

Table 1. (Continued).

Species	s	Saprobic valency					I	SI
		x	o	b	a	p		
Paramecium calkinsi Woodruff, 1921	a	–	–	–	10	–	5	3.0
Paramecium caudatum Ehrenberg, 1833	a	–	–	+	7	3	4	3.3E
Paramecium putrinum Claparède & Lachmann, 1859	p-i	–	–	–	1	9	5	3.9E
Paramecium woodruffi Wenrich, 1928	p-i	–	–	–	–	10	5	4.0E
Paramecium sp.	b-p	–	–	3	4	3	2	3.0
Paraurostyla viridis (Stein, 1859)	b-a	–	–	5	5	–	3	2.5
Paraurostyla weissei (Stein, 1859)	a	–	–	–	10	–	5	3.0
Paruroleptus musculus Kahl, 1932	a	–	–	1	8	1	4	3.0
Pelodinium reniforme Lauterborn, 1908	p-i	–	–	–	–	10	5	4.0E
Phascolodon vorticella Stein, 1859	b	–	–	8	2	–	4	2.2
Phialina coronata (Claparède & Lachmann, 1859)	b	–	1	8	1	–	4	2.0
Phialina pupula (O.F. Mueller, 1773)	b	–	–	10	–	–	5	2.0
Philasterides armata (Kahl, 1926)	b-a	–	–	5	5	–	3	2.5
Placus luciae (Kahl, 1926)	o-b	–	5	5	–	–	3	1.5
Placus ovum (Kahl, 1926)	b	–	–	10	–	–	5	2.0
Plagiocampa longis Kahl, 1927	a	–	–	–	10	–	5	3.0
Plagiopyla nasuta Stein, 1860	p-i	–	–	–	–	10	5	4.0E
Plagiopyla simplex Wetzel, 1928	p-i	–	–	–	–	10	5	4.0E
Platycola truncata (Fromentel, 1876)	b-a	–	2	4	4	–	2	2.2
Platynematum sociale (Penard, 1922)	a	–	–	2	7	1	3	2.9
Platyophrya vorax Kahl, 1926	p-i	–	–	–	–	10	5	4.0E
Pleuronema coronatum Kent, 1881	b	–	–	7	3	–	4	2.3
Pleuronema crassum Dujardin, 1841	o	–	10	–	–	–	5	1.0
Pleuronema setigerum Calkins, 1902	b	–	–	10	–	–	5	2.0
Pleurotricha grandis Stein, 1859	b	–	–	10	–	–	5	2.0
Podophrya fixa (O.F. Mueller, 1786)	a	–	–	1	7	2	3	3.1
Podophrya maupasii Buetschli, 1889	a	–	–	1	9	–	5	2.9
Propyxidium nutans (Stokes, 1889)	a	–	–	1	8	1	4	3.0
Prorodon ovum (Ehrenberg, 1831)	o-b	–	5	5	–	–	3	1.5
Prorodon platyodon Blochmann, 1895	b	–	–	10	–	–	5	2.0
Prorodon teres Ehrenberg, 1833	a	–	–	1	9	–	5	2.9
Prorodon viridis Kahl, 1927	a	–	–	1	6	3	3	3.2
Prorodon sp.	b-a	–	1	4	4	1	1	2.5
Pseudoblepharisma tenue (Kahl, 1926)	p	–	–	–	3	7	4	3.7
Pseudochilodonopsis algivora (Kahl, 1931)	a	–	–	–	10	–	5	3.0
Pseudochilodonopsis piscatoris (Blochmann, 1895)	b	–	–	7	3	–	4	2.3
Pseudocohnilembus pusillus (Quennerstedt, 1869)	a-p	–	–	–	5	5	3	3.5
Pseudoglaucoma muscorum Kahl, 1931	p-i	–	–	–	–	10	5	4.0E
Pseudokeronopsis rubra (Ehrenberg, 1835)	b-o	–	4	6	–	–	3	1.6
Pseudomicrothorax agilis Mermod, 1914	b	–	–	10	–	–	5	2.0
Pseudoprorodon ellipticus Kahl, 1930	b-a	–	–	5	5	–	3	2.5
Pseudoprorodon niveus (Ehrenberg, 1833)	o	–	10	–	–	–	5	1.0
Pseudovorticella chlamydophora (Penard, 1922)	b	–	–	8	2	–	4	2.2
Pseudovorticella margaritata (Fromentel, 1876)	b	–	3	7	–	–	4	1.7
Pseudovorticella monilata (Tatem, 1870)	a	–	–	1	9	–	5	2.9
Pyxicola carteri Kent, 1882	o-b	–	5	5	–	–	3	1.5
Rhabdostyla inclinans (O. F. Mueller, 1773)	a	–	–	–	10	–	5	3.0
Saprodinium dentatum (Lauterborn, 1901)	p-i	–	–	–	–	10	5	4.0E
Saprodinium putrinium Lackey, 1925	p-i	–	–	–	–	10	5	4.0E
Saprodinium sp.	p-i	–	–	–	–	10	5	4.0E

Table 1. (Continued).

Species	s	Saprobic valency					I	SI
		x	o	b	a	p		
Sathrophilus mobilis (Kahl, 1926)	b-a	–	–	6	4	–	3	2.4
Sathrophilus muscorum (Kahl, 1931)	b-a	–	–	5	5	–	3	2.5
Scyphidia hyalina Biegel, 1954	o-a	–	3	4	3	–	2	2.0
Scyphidia rugosa Dujardin, 1841	a	–	–	–	8	2	4	3.2
Spathidium depressum Kahl, 1930	o	–	7	3	–	–	4	1.3
Spathidium faurei Kahl, 1930	o	–	7	3	–	–	4	1.3
Spathidium gibbum Kahl, 1930	a	–	–	–	10	–	5	3.0
Spathidium spathula (O. F. Mueller, 1773)	o-b	–	5	3	2	–	2	1.7
Spathidium sp.	b-a	–	2	4	3	1	1	2.3
Sphaerophrya magna Maupas, 1881	p	–	–	–	2	8	4	3.8
Sphaerophrya pusilla Claparède & Lachmann, 1859	a	–	–	–	10	–	5	3.0
Sphaerophrya soliformis Lauterborn, 1908	p	–	–	–	1	9	5	3.9
Sphaerophrya stentoris Maupas, 1881	a-b	–	1	4	5	–	2	2.4
Sphaerophrya sp.	p-a	–	–	1	4	5	2	3.4
Spirostomum ambiguum (O. F. Mueller, 1786)	a	–	–	+	10	–	5	3.0
Spirostomum caudatum (O. F. Mueller, 1786)	o-b	–	6	4	–	–	3	1.4
Spirostomum intermedium Kahl, 1932	b-a	–	–	5	5	–	3	2.5
Spirostomum minus (Roux, 1901)	a-b	–	–	4	6	–	3	2.6
Spirostomum teres Claparède & Lachmann, 1858	p	–	–	1	2	7	2	3.6
Spirostomum sp.	b-p	–	1	3	3	3	1	2.8
Staurophrya elegans Zacharias, 1893	o-a	–	3	4	3	–	2	2.0
Steinia ferruginea (Stein, 1859)	o	–	7	3	–	–	4	1.3
Steinia platystoma (Ehrenberg, 1831)	b-a	–	–	6	4	–	3	2.4
Stentor coeruleus (Pallas, 1766)	a	–	–	2	8	+	4	2.8
Stentor igneus Ehrenberg, 1838	b	–	–	10	–	–	5	2.0
Stentor muelleri (Bory de St. Vincent, 1825)	b-a	–	–	5	5	–	3	2.5
Stentor niger (O. F. Mueller, 1773)	o-b	–	6	4	–	–	3	1.4
Stentor polymorphus (O. F. Mueller, 1773)	b	–	1	6	3	–	3	2.2
Stentor roeselii Ehrenberg, 1835	a-b	–	1	4	5	–	2	2.4
Stentor roeselii f. *stagnalis* Šrámek-Hušek	a-b	–	1	4	5	–	2	2.4
Stentor sp.	a-b	–	1	4	5	–	2	2.4
Stichotricha secunda Perty, 1849	o	–	7	3	–	–	4	1.3
Stokesia vernalis Wenrich, 1929	o-b	–	5	5	–	–	3	1.5
Strobilidium caudatum (Fromentel, 1876)	o-b	–	6	4	–	–	3	1.4
Strobilidium humile Penard, 1922	b	–	2	8	–	–	4	1.8
Strombidinopsis gyrans Kent, 1881	b	–	2	6	2	–	3	2.0
Strombidium viride Stein, 1867	b	–	1	8	1	–	4	2.0
Strongylidium lanceolatum Kowalewski, 1882	o	–	8	2	–	–	4	1.2
Stylonychia muscorum Kahl, 1932	b	–	–	10	–	–	5	2.0
Stylonychia mytilus complex	a	–	–	1	9	–	5	2.9
Stylonychia pustulata (O. F. Mueller, 1786)	b	–	–	9	1	–	5	2.1
Stylonychia putrina Stokes, 1885	a	–	–	2	7	1	3	2.9
Stylonychia vorax Stokes, 1885	b	–	–	10	–	–	5	2.0
Stylonychia sp.	a-b	–	–	4	5	1	2	2.7
Suctorella collini (Root, 1914)	a-b	–	–	4	6	–	3	2.6
Supraspathidium vermiforme (Penard, 1922)	a	–	–	+	8	2	4	3.2
Tachysoma furcatum Kahl, 1932	a-p	–	–	2	4	4	2	3.2
Tachysoma pellionellum (O. F. Mueller, 1773)	a-p	–	1	2	3	4	1	3.0
Tetrahymena pyriformis complex	a-i	–	–	–	3	7	4	3.7E
Thuricola folliculata Kent, 1881	b	–	2	6	2	–	3	2.0

Table 1. (Continued).

Species	s	Saprobic valency					I	SI
		x	o	b	a	p		
Thuricola kellicottiana (Stokes, 1887)	b	–	2	7	1	–	3	1.9
Thuricola vasiformis Hammann, 1952	a	–	–	–	10	–	5	3.0
Thuricola sp.	a	–	1	3	6	–	3	2.5
Tillina magna Gruber, 1879	p-i	–	–	–	–	10	5	4.0E
Tintinnidium fluviatile (Stein, 1863)	o-b	–	5	5	–	–	3	1.5
Tintinnopsis cylindrata Kofoid & Campbell, 1929	b	–	–	7	3	–	4	2.3
Tokophrya carchesii (Claparède & Lachmann, 1859)	a	–	–	2	7	1	3	2.9
Tokophrya infusionum (Stein, 1859)	b-a	–	2	5	3	–	2	2.1
Tokophrya lemnarum (Stein, 1859)	a	–	–	1	7	2	3	3.1
Tokophrya quadripartita (Claparède & Lachmann, 1859)	a-b	–	–	3	5	2	2	2.9
Tokophrya sp.	a-b	–	–	3	5	2	2	2.9
Trachelius ovum (Ehrenberg, 1831)	b	–	1	7	2	–	3	2.1
Trachelophyllum apiculatum (Perty, 1852)	b-a	–	–	5	5	–	3	2.5
Trachelophyllum brachypharynx Levander, 1894	a	–	–	–	10	–	5	3.0
Trachelophyllum pusillum (Perty, 1852)	b-a	–	–	5	3	2	2	2.7
Trachelophyllum sp.	a-b	–	–	4	5	1	2	2.7
Trichodina pediculus Ehrenberg, 1831	b	–	2	8	–	–	4	1.8
Trichospira inversa (Claparède & Lachmann, 1859)	a-p	–	–	–	5	5	3	3.5
Trimyema compressum Lackey, 1925	p-m	–	–	–	+	10	5	4.0E
Trithigmostoma cucullulus (O. F. Mueller, 1786)	a	–	+	1	9	–	5	2.9
Trochilia minuta (Roux, 1901)	b-a	–	–	5	5	–	3	2.5
Trochilia salina (Entz, 1879)	a	–	–	–	10	–	5	3.0
Trochilioides recta (Kahl, 1928)	a	–	–	–	10	–	5	3.0
Tropidoatractus acuminatus Levander, 1894	p-i	–	–	–	–	10	5	4.0E
Urocentrum turbo (O. F. Mueller, 1786)	b	–	–	7	3	–	4	2.3
Uroleptus lamella Ehrenberg, 1831	b	–	–	10	–	–	5	2.0
Uroleptus musculus (O. F. Mueller, 1773)	o	–	7	3	–	–	4	1.3
Uroleptus piscis (O. F. Mueller, 1773)	a	–	–	3	7	–	4	2.7
Uronema marinum Dujardin, 1841	a	–	–	1	8	1	4	3.0
Uronema parduczi Foissner, 1971	a	–	–	1	8	1	4	3.0
Urostyla grandis Ehrenberg, 1830	a	–	–	3	7	–	4	2.7
Urotricha agilis (Stokes, 1886)	a	–	–	–	10	–	5	3.0
Urotricha armata Kahl, 1927	a	–	–	2	8	–	4	2.8
Urotricha farcta Claparède & Lachmann, 1859	a-b	–	–	4	6	–	3	2.6
Urotricha globosa Schewiakoff, 1892	b	–	–	7	3	–	4	2.3
Urotricha ovata Kahl, 1926	a-p	–	–	–	6	4	3	3.4
Urotricha sp.	a	–	–	2	6	2	3	3.0
Urozona buetschlii Schewiakoff, 1889	p-i	–	–	–	+	10	5	4.0E
Vaginicola crystallina Ehrenberg, 1830	b-a	–	–	5	5	–	3	2.5
Vaginicola ingenita (O. F. Mueller, 1786)	b-a	–	–	6	4	–	3	2.4
Vaginicola striata (Fromentel, 1876)	a	–	–	2	8	–	4	2.8
Vaginicola tincta Ehrenberg, 1830	o-b	–	5	5	–	–	3	1.5
Vaginicola sp.	b-a	–	1	4	5	–	2	2.4
Vorticella aequilata Kahl, 1935	p	–			+	10	5	4.0E
Vorticella alba Fromentel, 1876	a-p	–	–	–	5	5	3	3.5
Vorticella campanula Ehrenberg, 1831	b	–	1	6	3	–	3	2.2
Vorticella campanulata Šrámek-Hušek, 1948	b-a	–	–	5	5	–	3	2.5
Vorticella citrina O. F. Mueller, 1773	b	–	–	8	2	–	4	2.2
Vorticella communis Fromentel, 1876	b	–	–	10	–	–	5	2.0
Vorticella convallaria (Linnaeus, 1758)	a	–	–	1	9	–	5	2.9

Table 1. (Continued).

Species	s	Saprobic valency					I	SI
		x	o	b	a	p		
Vorticella cupifera Kahl, 1935	b-a	–	–	5	3	2	2	2.7
Vorticella elongata Fromentel, 1876	b	–	–	10	–	–	5	2.0
Vorticella fromenteli Kahl, 1935	a	–	–	2	8	–	4	2.8
Vorticella hamatella Foissner, 1987	b-a	–	–	4	6	–	3	2.6
Vorticella hians O. F. Mueller, 1773	p-i	–	–	–	+	10	5	4.0E
Vorticella marginata Stiller, 1931	b	–	2	8	–	–	4	1.8
Vorticella mayeri Fauré – Fremiet, 1920	b	–	–	10	–	–	5	2.0
Vorticella microstoma Ehrenberg, 1830	p-i	–	–	–	–	10	5	4.0
Vorticella microstoma f. *elongata* Stiller, 1954	p	–	–	–	+	10	5	4.0
Vorticella microstoma f. *monilata* Stiller, 1954	p	–	–	–	+	10	5	4.0
Vorticella microstoma f. *turgescens* Stiller, 1954	p-i	–	–	–	–	10	5	4.0E
Vorticella natans (Fauré – Fremiet, 1924)	b	–	3	7	–	–	4	1.7
Vorticella nebulifera O. F. Mueller, 1773	o-b	–	6	4	–	–	3	1.4
Vorticella nutans O. F. Mueller, 1773	b	–	–	10	–	–	5	2.0
Vorticella octava Stokes, 1885	a-b	–	1	3	4	2	1	2.7
Vorticella picta (Ehrenberg, 1831)	o	–	9	1	–	–	5	1.1
Vorticella picta f. *longa* Nusch, 1970	a	–	–	2	8	–	4	2.8
Vorticella similis Stokes, 1887	o-b	–	6	4	–	–	3	1.4
Vorticella telescopica Kent, 1881	a-p	–	–	–	5	5	3	3.5
Vorticella telescopioides Šrámek-Hušek, 1948	a-p	–	–	–	5	5	3	3.5
Vorticella vernalis Stokes, 1887	b	–	–	10	–	–	5	2.0
Vorticella vestita Stokes, 1883	a	–	–	2	8	–	4	2.8
Vorticella sp.	b-p	–	–	3	3	4	2	3.1
Zoothamnium arbuscula (Ehrenberg, 1831)	p-a	–	–	+	4	6	3	3.6
Zoothamnium asellicola Foissner, 1987	b-a	–	–	5	5	–	3	2.5
Zoothamnium hentscheli Kahl, 1935	b-a	–	–	5	5	–	3	2.5
Zoothamnium mucedo Entz, 1884	b-a	–	–	5	5	–	3	2.5
Zoothamnium procerius Kahl, 1935	b-a	–	–	5	5	–	3	2.5
Zoothamnium sp.	a	–	–	2	6	2	2	3.0

5.1. Introductory remarks

The taxonomic and nomenclatural rectifications caused some alterations in the saprobiological classification of a few species. I tried to minimize such changes, because it is not the goal of this paper to revise the saprobiological classification itself. Thus, I always cited the original classifications of Sládeček *et al.* (1981) and/or Wegl (1983) in chapter 4, if there is a difference between these authors or to the values shown in Table 1. This gives the user the possibility to decide according to his own experience.

The changes mentioned above are not indicated in Table 1, because this would make it unwieldy. Generally, I used Sládeček's *et al.* (1981) classification or that with the broader range of valencies, if Sládeček *et al.* (1981) and Wegl (1983) disagree (e.g. *Codonella cratera, Askenasia volvox*). In some cases, I used the classification of Wegel (if more appropriate in my experience; e. g. *Hastatella radians, Homalozoon vermiculare*), the arithmetic mean of Sládeček's *et al.* and Wegl's values (e.g. *Vorticella nebulifera*) or a new one, if the suggestions of these authors completely disagree with my experience and data from literature (single case: *Cyrtolophosis mucicola*).

Objective and subjective synonyms were treated in the same way, if they have been differently classified by Sládeček *et al.* (1981) and/or Wegl (1983) (e.g. *Calyptotricha lanuginosa* and *Cyclidium lanuginosum* or *Chilodonella uncinata* and *C. dentata*).

5.2. Explanation of abbreviations

a = alpha-mesosaprobity; b = beta-mesosaprobity; i = isosaprobity; o = oligosaprobity; p = polysaprobity; s = indication of saprobity by simple letter; x = xenosaprobity.
E = eusaprobity; this letter marks cases where the limnosaprobity (x, o, b, a, p) does not concur with the eusaprobity (*i*sosaprobity, *m*etasaprobity, *h*ypersaprobity). These species often indicate the presence of hydrogen sulfide (H_2S) or are at least rather tolerant towards this poison. The eusaprobic classification is not treated here in more detail, because it is not widely used. In cases where it may be appropriate, the reader should consult Table 18 in Sládeček *et al.* (1981); I = indicative weight of species (ranging between 1 and 5); SI = saprobic index (ranging from 0–4 in the limnosaprobic area and from 0–8 in the eusaprobic area).

6. Systematic index to chapter 4

The index is thought as an aid for users who are accustomed to the lists of Sládeček (1973), Sládeček *et al.* (1981) and/or Wegl (1983). Valid names appear in a regular (roman) style of print, invalid names (synonyms, misspellings etc.) appear in italics.

Summary

A taxonomic and nomenclatural revision of Sládeček's *et al.* (1981) and Wegl's (1983) lists of ciliates (Protozoa: Ciliophora) as indicators of water quality has been performed. This revision was necessary, because more than 50% of the names listed by these authors contain misspellings, nomenclatural errors, or are outdated. Some major changes in alpha-taxonomy (sibling species etc.) since the monographic accounts of Kahl (1930–35) are explained and some important recent textbooks and systematic monographs on ciliates are quoted. The original reference, important synonyms, and modern taxonomic literature are provided for each of the 378 species recognized. 8 out of these 378 species are new saprobiological classifications. The results of this revision are summarized in a table which shows the correct (modern) name, the author, and the date of publication of each species as well as its saprobity, its saprobic valency, its indicative weight, and its saprobic index. A systematic index is given to all species names which appear either in Sládeček *et al.* (1981) and Wegl (1983) or in the present paper.

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