

Epistylis, Apiosoma, Scyphidia, Ambiphrya, Vorticella, Carchesium, Zoothamnium, Cothurnia, Vaginicola, Lagenophrys
(protist: ciliate)

Overview

Protists are single-celled organisms with membrane-bound nuclei (eukaryotes). One protistan supergroup known as SAR comprises the Stramenopiles (with heterokont flagella), Alveolata (with cortical alveoli) and Rhizaria (with fine pseudopodia). Three major alveolate groups are recognized: ciliates, apicomplexans and dinoflagellates. Ciliated protozoa are unique eukaryotes as they exhibit nuclear dualism (vegetative macronucleus and reproductive micronucleus), the process of conjugation (exchange of micronuclei between pairs), have membrane-bound sacs (subpellicular alveoli) supporting the plasma membrane, and move using cilia (2+9 undulipodia with compound subpellicular infraciliature). Most ciliates are free-living in aquatic and terrestrial habitats, but some are symbiotic in vertebrate and invertebrate hosts. Ten major monophyletic lineages are recognized on the basis of their infraciliature, i.e. the ultrastructural organization of their kinetids (comprising basal bodies (= kinetosomes) and associated microtubular ribbons and fibrils). Members of the subphylum Intramacronucleata are united by the presence of microtubules inside the macronuclear envelope during division; including the oligohymenophoreans ('few membrane-bearer') with an adoral zone of three membranelles. Peritrichous ciliates are filter-feeders with a left-hand spiral of oral cilia leading to cytostome. They live attached permanently (sessilines) or temporarily (mobilines) to substrates, which may include other aquatic animals. Many species cause significant fouling of the external surfaces and/or gills of fish and shellfish, some tentatively associated with diminished respiratory and feeding functions, and severe fouling leading to consumer aversion.

Classification:

Domain: Eukaryota (membrane-bound nucleus)
Supergroup: SAR (Stramenopiles + Alveolata + Rhizaria)
Group: Alveolata (with cortical alveoli)
Phylum: Ciliophora (with cilia, nuclear dualism, pellicular alveoli, reproductive conjugation)
Subphylum: Intramacronucleata (microtubules occur inside macronuclear envelope during division)
Class: Oligohymenophorea (distinct oral ciliature, comprising right paroral membrane and 3 left membranelles)
Subclass: Peritrichia (body inverted bell-shaped, conspicuous buccal ciliature encircles apical pole (peristomial field) winding counterclockwise plunging to buccal infundibulum, antapical pole with holdfast (scopula or adhesive disc), predominantly bacterivores, often stalked)
Order: Sessilina (attached to substrate with scopula (specialized flattened thigmotactic area) with or without stalk)
Family: Epistylidae (scopula produces noncontractile stalk, retractile lip encircles elevated peristomial disc)
Genus: *Apiosoma* (circular scopula, sometimes lobed/split into ramiform projections, epizoic on skin/gills of fish)
Genus: *Epistylis* (colonial ciliates, stalk, noncontractile, branched, epizoic on fish and crustacea)
Family: Scyphidiidae (solitary ciliates, attached by scopula)
Genus: *Scyphidia* (large scopula, cell usually cylindrical, epizoic on fish and crustacea)
Genus: *Ambiphrya* (scopula, locomotory fringe of cilia, motile in swarms, epizoic on fish and crustacea)
Family: Vorticellidae (solitary, gregarious or colonial, retractile stalks with central myoneme)
Genus: *Vorticella* (stalk, contractile, unbranched, solitary or gregarious, epizoic on fish and crustacea)
Genus: *Carchesium* (stalk, basal part contractile, branched, colonial, epizoic on fish and crustacea)
Family: Zoothamniidae (solitary or colonial, retractile stalks with shared myonemes, epizoic on fish and crustacea)
Genus: *Zoothamnium* (stalk, contractile, branched, colonial)
Family: Vaginicolidae (upright lorica)
Genus: *Cothurnia* (vase-shaped, short stalk, epizoic on crustacea)
Genus: *Vaginicola* (urn-shaped, stalkless, epizoic on crustacea)
Family: Lagenophryidae (flat discoid lorica)
Genus: *Lagenophrys* (lateral aperture, epizoic on crustacea)

Parasite biodiversity and host range: Protists are unicellular eukaryotes that move using undulipodia (flagella or cilia), pseudopodia (false-feet) or a unique gliding motion. Cells with different modes of locomotion do not form separate monophyletic assemblages as previously thought, but rather are distributed across several disparate supergroups (as evidenced by recent molecular phylogenetic analyses). One protistan supergroup known as SAR comprises the Stramenopiles (with heterokont flagella), Alveolata (with cortical alveoli) and Rhizaria (with fine pseudopodia). Three diverse alveolate groups are recognized: Ciliophora (with cilia), Dinoflagellata (with flagella) and Apicomplexa (with gliding motion, some also with flagellated microgametes). Ciliated protozoa are unique amongst the unicellular eukaryotes because they are the only group to exhibit nuclear dualism. Individual cells possess two different types of nuclei; vegetative macronuclei and reproductive micronuclei. Asexual reproduction occurs by transverse binary fission across rows of cilia (homothetogenic fission) whereas some species exhibit sexual reproduction by the phenomenon of conjugation (temporary fusion of two conjugates which exchange micronuclei). As their common name implies, ciliates are also

characterized by the possession of simple cilia, or compound ciliary organelles, in at least one stage of their life cycles (compound subpellicular infraciliature is universally present even when cilia are absent). Cilia are elongate hair-like extensions of the cell membrane with an internal microtubular core (universal 2+9 configuration = 2 single central microtubules surrounded by 9 peripheral doublets). They are organelles of motility used for locomotion and/or feeding. Cilia (singular, cilium) are similar in ultrastructure to flagella (singular, flagellum), and they are collectively often called undulipodia (singular, undulipodium) because both use cross-linked proteins (dynein-walking mechanism) to undulate about their basal kinetosome (unlike the rotary motion unique to flagella in bacteria). Ciliates, together with dinoflagellates and apicomplexans, possess subpellicular alveoli which are membrane-bound sacs beneath the plasma membrane. Alveoli are thought to serve many varied functions: ranging from support (helping maintain body shape, act as fulcrum for undulipodia); metabolism (storage); osmoregulation (mucocysts); excretion (extrusomes); protection (toxicysts, trichocysts); and even hunting (haptocysts).

Most ciliate species are free-living in aquatic or terrestrial habitats but many are commensals in vertebrate or invertebrate hosts and some are parasitic. Early classification systems recognized three main classes of ciliates mainly on the basis of their patterns of somatic (body) and buccal (oral) ciliation. The 'lower holotrichs' have simple body and oral ciliation; most are free-living species but some are highly specialized symbionts aiding cellulose digestion in herbivores. The 'higher holotrichs' have simple body ciliation but more specialized oral ciliation forming membranelles; most occur as free-living organisms but some live as commensals or parasites in a range of animals. The 'spirotrichs' have reduced body ciliation but well-developed oral ciliation forming an adoral zone of membranelles; most are bacterivores living in aquatic and terrestrial habitats. More recently, ten major monophyletic lineages have been recognized on the basis of their infraciliature; i.e. the ultrastructural organization of their kinetids (comprising basal bodies (= kinetosomes) and associated microtubular ribbons and fibrils). These lineages (ranked as classes) have been well supported by modern molecular biological studies using several gene sequences.

Class	Etymology	Defining characters	Lifestyles*	Genera covered
Subphylum: Postciliodesmatophora [somatic dikinetids with postciliodesmata (overlapping microtubular ribbons)]				
Karyorelictea	'primitive-nucleus'	macronuclei not dividing but replaced by division of micronuclei	free-living (aquatic benthic/planktonic)	
Heterotrichea	'different-hair'	compound ciliary organelles around mouth, macronuclei divided by external microtubules	free-living (aquatic planktonic/benthic)	
Subphylum: Intramacronucleata [macronuclei divided by internal microtubules]				
Spirotrichea	'coiled-hair'	conspicuous right and left oral ciliation, left polykinetids leading into oral cavity	free-living (aquatic, terrestrial)	
Litostomatea	'simple-mouths'	cytostome with noncurved tubular cytopharyngeal apparatus (rhabdos)	free-living (often predatory), symbiotic	<i>Balantidium</i>
Phyllopharyngea	'leaf-throated'	mouth with radial microtubular ribbons (phyllae), some with sticky feeding tentacles	free-living (aquatic), epizoic, symbiotic	<i>Chilodonella</i>
Colpodea	'breast-shaped'	reniform bodies, somatic cilia with transverso-desmata (overlapping ribbons)	terrestrial, some aquatic (bacterivores)	
Nassophorea	'pot-bearer'	oral nematodesmata well-developed (basket-like nasse or cyrtos supporting cytopharynx)	free-living (aquatic, terrestrial)	
Prostomatea	'before-mouth'	simple apical mouths, some with oral microtubular band, some with oral brush	free-living (often predatory)	
Plagiopylea	'misshapen-marker'	with twisted oral tubes, most with hydrogenosomes	free-living (anoxic habitats)	
Oligohymenophorea	'few membrane-bearer'	typically with ventral groove containing mouth and compound ciliary organelles (usually adoral zone of three membranelles)	free-living, epizoic, symbiotic (microphagous)	<i>Uronema</i> , <i>Ichthyophthirus</i> , <i>Tetrahymena</i> , <i>Trichodina</i> , <i>Vorticella</i>

*Symbiosis *sensu lato* ranges from commensalism, mutualism and parasitism (depending on the benefit/detriment to the host)

The class Oligohymenophorea contains ciliates whose somatic (body) kinetosomes (basal bodies) are associated with unique ultrastructural elements (collectively referred to as infraciliature) comprising anteriorly-directed overlapping kinetodesmal fibrils, divergent postciliary microtubular ribbons and radial transverse ribbons. Members are considered to be 'higher' holotrichs as there is clear distinction between the oral and somatic ciliation. They possess distinctive oral kineties consisting of a right paroral kinety (membrane) and typically 3 left oral polykinetids (membranelles) located in a buccal or infundibular cavity with an inconspicuous cytopharyngeal apparatus. They are widely distributed in aquatic habitats (fresh, brackish and marine waters) where they occur as free-living stages (free-swimming or attached to substrates), some being epizoic (rarely endozoic) on aquatic animals (mainly crustacea and fish). Free-living aquatic species are highly sensitive to environmental changes and a range of species are used as bioindicators for the assessment of water quality (saprobic classifications) and even sludge activity in wastewater treatment. The

class contains 6 subclasses (Apostomatia, Astomatia, Hymenostomatia, Peniculia, Peritrichia, Scuticociliatia) differentiated predominantly on the basis of their patterns of somatic and oral ciliation. Peritrichous ciliates are filter-feeders with inverted bell-shaped bodies having prominent buccal ciliature encircling the apical pole (forming a peristomial field) and winding counterclockwise (left hand spiral) to plunge into the oral cavity (infundibulum) to the cytostome (mouth). The peristomal border consists of a dikinetid file (considered homologous to the paroral membrane) surrounding a triple row of cilia (considered homologous to the polykinetid membranelles). The narrow antapical pole of the cells possess barren kinetosomes as part of a holdfast apparatus (scopula or adhesive disc). Mature trophonts (often called zooids) lack somatic kineties but the transient dispersal telotroch (swarmer) stages may develop temporary ciliary rings for locomotion. Two peritrich orders are recognized depending on whether mature trophonts live attached permanently (Sessilida) or temporarily (Mobilida) to substrates, which in many cases may include other aquatic animals and plants.

Higher taxonomy	Family	Exemplar genera	Hosts	Site	Transmission
Subclass: Peritrichia (lacking somatic kineties, oral cilia extend from infundibulum)					
Order: Mobilida (mature trophont mobile, aboral holdfast organelle)	Trichodinidae (stout cylindrical body, posterior adhesive disc with denticular ring)	<i>Trichodina</i>	fish	skin, gills	direct
Order: Sessilida (mature trophont sessile, attached to substrate by scopula (special flat thigmotactic area) with or without stalk)	stalkless				
	Scyphidiidae (solitary ciliates, attached by scopula)	<i>Scyphidia</i>	fish, crustacea	exoskeleton	direct
		<i>Ambiphrya</i>	fish, crustacea	exoskeleton	direct
	stalked				
	Epistylididae (scopula produces noncontractile stalk, retractile lip encircles elevated peristomial disc)	<i>Apiosoma</i>	fish	skin, gills	direct
		<i>Epistylis</i>	fish, crustacea	exoskeleton	direct
	Vorticellidae (solitary, gregarious or colonial, retractile stalks with central myoneme)	<i>Vorticella</i>	fish, crustacea	exoskeleton	direct
		<i>Carchesium</i>	fish, crustacea	exoskeleton	direct
	Zoothamniidae (solitary or colonial, retractile stalks with shared myonemes)	<i>Zoothamnium</i>	fish, crustacea	exoskeleton	direct
	loricate				
Vaginicolidae (upright lorica)	<i>Cothurnia</i>	crustacea	exoskeleton	direct	
	<i>Vaginicola</i>	crustacea	exoskeleton	direct	
Lagenophryidae (discoid lorica)	<i>Lagenophrys</i>	crustacea	gills	direct	

The order Sessilida is characterized by ciliates with inverted bell-shaped or conical-cylindrical bodies that are attached to substrates by an aboral scopula (specialized flattened thigmotactic area) with or without a stalk. They have prominent oral ciliature, organized around a peristome (expanded oral region for suspension-feeding), comprising a prominent paroral membrane (outer haplokinety) accompanied by a smaller series of membranelles (inner polykinety, often triple) circling counter-clockwise around the apical funnel-shaped oral cavity. The apical surface inside the peristomial spiral is often vaulted (forming an epistomial disc) and raised above the borders (peristomial lips) when the zooid is relaxed and feeding, but can be retracted when the zooid is disturbed and contracts. The ciliates are dimorphic with mature trophonts (zooids) being the sedentary (sessile) attached stages, and telotrochs being unattached mobile migratory (dispersal) stages. The zooids of some species may also exhibit significant size variation, forming 'ordinary' zooids, large macro-zooids and sometimes smaller micro-zooids. Cyst formation has also been described for some species experiencing adverse environmental conditions. Trophonts may exhibit isotomic or anisotomic division, and many species are gregarious forming small colonies (many species with long stalks form arboroid (tree-like) colonies). Sessiline peritrichs are often free-living attaching to inert substrates (e.g. periphytic, epiphytic) but some also attach to the surfaces of aquatic animals as ectosymbiotes (epizoic, rarely endozoic). The trophonts are stationary suspension/filter-feeders, using their oral ciliature to sweep bacteria, phytoplankton and particulate material into their mouths. However, heavy infestations of animals (especially crustaceans such as crayfish and shrimp) may cause significant fouling imparting an unsightly appearance, obstructing oral structures interfering with feeding leading to poor growth and development with loss of condition, or obstructing the gills compromising respiratory function leading to anoxia and respiratory distress and sometimes death. Blooms of fouling organisms may cause serious economic losses in aquaculture due to loss of product through morbidity and mortality.

Numerous peritrichous ciliate species have been described, with many subsequently being revised and reassigned to different genera as new characters were incorporated into taxonomic classifications. Some early descriptions were deemed inadequate or incomplete, leading to *species inquirenda* ('doubtful identity'), *nomina dubia* ('doubtful names') or *nomina nuda* ('invalid names'). Some studies have also misidentified other small aquatic organisms with distinct ciliary wreaths and/or stalks or peduncles,

especially small rotifers, other ciliates (folliculinds, stentorids), and occasionally dinoflagellates, hydrozoans and bryozoans. This has led to many species being synonymized, disputed or disregarded. Molecular characterization studies are slowly bringing some clarity to peritrich phylogeny, but studies are in their infancy and workers are generally stuck with having to provide multiple names to ensure historical and contemporary relevance. At present, over 130 genera of sessile peritrichs are recognized within 14 families which may be allocated to 3 broad groups: those without stalks; those with prominent stalks; and those with loricae.

Stalkless sessiline peritrichs have been classified into 6 families:

- The family Scyphidiidae contains species with solitary zooids attached to substrates by scopulary organelles forming flattened discs distinct from the rest of the body. They are generally found as epibionts on aquatic organisms and have been grouped into 9 genera: *Ambiphrya*, *Corlissetta*, *Gonzeella*, *Mantoscaphidia*, *Pachystomos*, *Ophrydiopsis* (syn. *Scyphidiella*), *Paravorticella*, *Riboscaphidia*, and *Scyphidia*. [A proposal to recognize genera based on hosts/substrates has only been partly adopted; with *Mantoscaphidia* and *Riboscaphidia* containing species on gastropods and fish respectively, *Scyphidiella* containing species on waterborne Coleoptera synonymized with *Ophrydiopsis*, and free-living and epiphytic species retained in the genus *Scyphidia* (rather than divided into *Speleoscyphidia* and *Myoscyphidia*)].
- The family Astylozoidae contains species with elongate to vase-shaped bodies lacking aboral rings of cilia but with posterior spines and sometimes long recurved cortical spines. The family contains 2 genera: *Astylozoon* (syn. *Geleiella*) and *Hastatella*.
- The family Ellobiophryidae contains species whose scopulae form cylindrical projections that encircle gill filaments of marine molluscan and piscine hosts. The family contains 2 genera: *Caliperia* and *Ellobiophrya* (syn. *Clausophrya*).
- The family Ophryidiidae contains species with bulbous bodies housed in gelatinous cases or embedded in solid jelly-like masses, often supported by posterior spines. They have peristomial ciliary wreaths with 1-3 turns and have been allocated to 2 genera: *Gerda* (syn. *Ophionella p.p.*) and *Ophrydium* (syn. *Ophionella p.p.*, *Echinella*, *Raphanella*).
- The family Opisthnectidae contains species with conical-cylindrical bodies with or without epistomial membranes but with an aboral ring of cilia with strongly argentophilic granules. The family contains 2 genera: *Opisthnecta* and *Telotrochidium*.
- The family Termitophryidae contains one or more species that form unique pad-like attachment discs within the hindguts of termites, all allocated to the single genus *Termitophrya*.

STALKLESS PERITRICHS				
Species	Trophont size (µm)	Habitat/Hosts	Life-style [disease]	Distribution
Family: Astylozoidae				
Genus: Astylozoon (lanceolate bodies, aboral ring of cilia absent but with several short stiff cilia)				
<i>A. enriquesi</i>	40-65	freshwater (planktonic)	free-living	Europe
<i>A. fallax</i> [type species]	36-100	freshwater (planktonic)	free-living	Eurasia
<i>A. faurei</i>	35-65 x 30-55	freshwater (planktonic)	free-living	Eurasia
<i>A. pyriforme</i> (syn. <i>A. amphoriforme</i>)	35-65 x 37-40	freshwater (planktonic)	free-living	Europe
<i>Ax. vagans</i> (syn. <i>Geleiella</i>)	43-75 x 50-60	freshwater (planktonic)	free-living	Europe
Genus: Hastatella (vase-shaped bodies, aboral ring of cilia absent but with spine, body with 2-4 rings of long conical ectoplasmic processes (spines))				
<i>H. aesculacantha</i>	30-52 x 24-41	freshwater (planktonic)	free-living	Europe
<i>H. radians</i> (syn. <i>H. microradians</i>) [type species]	30-75 x 25-70	freshwater (planktonic)	free-living	Eurasia, America
Family: Ellobiophryidae (solitary, stalkless, scopula with cylindrical projections (limbs) that form a ring-like holdfast (cinctum) encircle gill filaments or feeding tentacles of marine hosts (fish and molluscs))				
Genus: Caliperia (cinctum noncontractile with non-joined limbs, internal rod-like organelle present)				
<i>C. brevipes</i> (syn. <i>Ellobiophrya</i>)	29-73 x 21-38	marine, attached to fish (Rajiformes: rajid (little skate))	epizoic (gills)	North America
<i>C. longipes</i> [type species]	31-68 x 24-53	marine, attached to fish (Blenniiformes: clinid (orange clinid); Gobiesociformes: gobiesocid (striped clingfish))	epizoic (gills)	New Zealand
Genus: Ellobiophrya (cinctum contractile with joined limbs, lacking internal rod-like organelle)				
<i>E. branchialis</i> (syn. <i>Clausophrya</i>)	57-120 x 28-55	marine, attached to fish (Atheriniformes: atherinid (short snout hardyhead, small mouth hardyhead, pikehead hardyhead, silver fish))	epizoic (gills)	Australia

<i>E. brevipes</i>	54-60 x 35	marine, attached to fish (Rajiformes: rajid (little skate))	epizoic (gills)	North America
<i>E. conviva</i>	46 x 27	marine, attached to bryozoa (Gymnolaemata: bugulid (<i>Bugula neritina, turrita</i>))	epizoic (tentacles)	North America
<i>E. donacis</i> [type species]	40-100 x 30-40	marine, attached to shellfish (Bivalvia: donacid (<i>Donax vittatus</i>))	epizoic (gills)	Europe
<i>E. maliculiformis</i>	50-125 x 15-30	marine, attached to ciliates (Peritricha: scyphidiid (<i>Mantoscyphidia spadiceae, midae, branchi</i>) attached to gills of abalone (Gastropoda: haliotid (<i>Haliotis spadicea, midae</i>) and limpets (Gastropoda: patellid (<i>Scutellastra barbara</i>))	epizoic (near scopula)	South Africa
<i>E. oblida</i> (syn. <i>Clausophrya</i>)	180 x 36	marine, attached to fish (Gobiiformes: gobiid (tubenose goby))	epizoic (skin)	Black Sea
Family Scyphidiidae				
Genus <i>Ambiphrya</i> (permanent equatorial ciliary fringe, motile in swimmers but motionless in attached zooids, cilia often shielded by thin pellicular fold (median membrane))				
<i>A. ameiuri</i> (syn. <i>Scyphidia</i>)	34-95 x 20-61	freshwater, attached to fish (Cichliformes: cichlid (mango tilapia); Cypriniformes: cyprinid (common carp, grass carp); Cyprinodontiformes: anablepid (onesided livebearer); Perciformes: latid (Nile perch); Siluriformes: ictalurid (channel catfish, black bullhead catfish))	epizoic (gills, skin) [respiratory problems]	Eurasia, Americas
<i>A. macropodia</i> (syn. <i>Scyphidia</i>)	35-46 x 20-25	freshwater, attached to fish (Perciformes: centrarchid (bluegill); Siluriformes: ictalurid (brown bullhead, channel catfish))	epizoic (skin, gills)	North America
<i>A. miri</i> [type species]	45 x 25	brackish water, attached to fish (Syngnathiformes: syngnathid (straightnose pipefish))	epizoic (gills)	Europe
<i>A. neobolae</i>	44-84 x 24-45	freshwater, attached to fish (Cypriniformes: danionid (river sardine))	epizoic (skin)	Africa
<i>A. tholiformis</i> (syn. <i>Scyphidia</i>)	59 x 35	freshwater, attached to fish (Perciformes: centrarchid (smallmouth bass, largemouth bass))	epizoic (gills, skin)	North America
Genus <i>Corlissetta</i> (solitary, elongate zooids, transversely striated, short basal pointed scopula)				
<i>C. anivica</i>	71-74 x 17-19	marine, attached to invertebrates (Polychaeta: nephtyid (<i>Nephtys californiensis</i>))	epizoic	Atlantic
Genus <i>Gonzeella</i> (colonial, zooids in gelatinous mass, colony hollow and ball-like, zooids without zoochlorellae)				
<i>G. coloniaris</i> [type species]	60-95 x 24-32	freshwater	free-living	Africa
Genus: <i>Mantoscyphidia</i> (solitary, cylindrical bodies, broad scopula, peristomial ciliary wreath with 1½ turns, associated with aquatic gastropods)				
<i>M. acanthophora</i> (syn. <i>Scyphidia</i>)	20-40	marine, associated with sea snails (Gastropoda: trochid (<i>Gibbula umbilicalis, Monodonta lineata</i>))	epizoic (mantle cavity)	Europe
<i>M. australorbicola</i> (syn. <i>Glossatella</i>)		freshwater, associated with snails (Gastropoda: planorbis (<i>Australorbis</i>))	epizoic (gills)	South America
<i>M. bengalensis</i>		estuarine, associated with mud snails (Gastropoda: potamidid (<i>Cerithidea cingulata</i>))	epizoic (mantle cavity)	India
<i>M. branchi</i>	44-78 x 17-32	marine, associated with sea snails (Gastropoda: patellid (<i>Patella aphanes, argenvillei, barbara, cochlear, compressa, concolor, granatina, granularis, longicosta, miniata, obteca, oculus, pica, tabularis, Helcion dunkeri</i>))	epizoic (gills)	Africa

		<i>pectunculus, pruinosis</i>), nacellid (<i>Cellana capensis</i>)		
<i>M. capitis</i>		freshwater, associated with snails (Gastropoda (unspecified))	epizoic	Asia
<i>M. fanthami</i>	80-130 x 25-35	marine, associated with sea snails (Gastropoda: trochid (<i>Oxystele sinensis</i> , <i>tabularis, tigrina, variegata, impervia</i>))	epizoic (gills)	Africa
<i>M. fischeri</i> (syn. <i>Scyphidia</i> , <i>Scyphidiella</i>)	60	marine, associated with sea snails (Gastropoda: truncatellid (<i>Truncatella</i> <i>truncatula</i>))	epizoic (mantle and genital cavities)	Europe
<i>M. hydrobiae</i> (syn. <i>Scyphidia</i>)	70	brackish water, associated with sea snails (Gastropoda: hydrobiid (<i>Hydrobia ventrosa</i>), littorinid (<i>Littorina rudis</i>))	epizoic (tentacles, mouth)	Europe
<i>M. inclinata</i>		freshwater, associated with snails (Gastropoda: hydrobiid (<i>Cincinnatia</i>))	epizoic	North America
<i>M. limacina</i> (syn. <i>Scyphidia</i> , <i>Vorticella</i>)	70-100	freshwater, associated with snails (Gastropoda: planorbid (<i>Planorbis</i>))	epizoic (mantle cavity)	Europe
<i>M. littorinae</i> [type species as <i>Scyphidia</i>]		marine, associated with sea snails (Gastropoda: littorinid (<i>Littorina</i>))	epizoic	Adriatic Sea
<i>M. lusitana</i>		marine, associated with sea snails (Gastropoda: patellid (<i>Patella vulgata</i>))	epizoic	Europe
<i>M. midae</i>	65-150 x 18-45	marine, associated with abalone (Gastropoda: haliotid (<i>Haliotis midae</i>))	epizoic (gills)	Africa
<i>M. patellae</i> (syn. <i>Cothurnia</i> , <i>Scyphidia</i>)	30-45	marine, associated with sea snails (Gastropoda: patellid (<i>Patella argentea</i> , <i>vulgata</i>))	epizoic (mantle cavity)	Europe
<i>M. physarum</i> (syn. <i>Scyphidia</i> , <i>Scyphidiella</i>)	80-110	freshwater, associated with snails (Gastropoda: physid (<i>Physa</i>), neritid (<i>Neritina</i>))	epizoic (mantle cavity)	Europe
<i>M. spadiceae</i>	70-140 x 20-40	marine, associated with abalone (Gastropoda: haliotid (<i>Haliotis</i> <i>spadicea</i>))	epizoic (gills)	Africa
<i>M. ubiquita</i> (syn. <i>Scyphidia</i> , <i>Gerda</i>)	30-117 x 25-52	marine, associated with limpets (Gastropoda: acmaeid (<i>Acmaea pelta</i> , <i>digitalis, limatula, scabra, insessa</i> , <i>fenestrata</i>), fissurellid (<i>Fissurella</i> <i>volcano</i>), littorinid (<i>Littorina</i>), lottid (<i>Lottia gigantea, pelta, digitalis</i> , <i>Tectura persona, scutum</i>), tegulid (<i>Tegula funebris, ligulata</i>), trochid (<i>Gibbula</i>))	epizoic (mantle cavity)	North America
Genus: Ophrydiopsis (solitary in gelatinous/mucilaginous case, elongate trumpet-shaped body, truncated diagonally anteriorly, without peristomial lip (operculariform), tube-like posterior extension to disc-like scopula)				
<i>O. concava</i> [type species] (syn. <i>Scyphidiella</i>)	70-80	freshwater	free-living	Europe
Genus Pachystomos (solitary, globular zooid with apical peristome, 2 posterior pseudopodial-like projections enable zooid to slide along filamentous substrates)				
<i>P. olisthus</i> [type species]	200	freshwater	free-living	North America
Genus: Paravorticella (solitary, elongate trumpet-shaped bodies, stalkless (but often appearing to have a very short stalk), narrow scopula, highly contractile, peristomial disc not stalked)				
<i>P. clymenellae</i>	100	marine, attached to worm (Polychaeta: malidanid (<i>Clymenella torquata</i>))	epizoic	Europe
<i>P. lycastis</i>		freshwater, attached to worm (Polychaeta: nereidid (<i>Lycastis indica</i>))	epizoic (parapodia)	India
<i>P. nerillae</i>	60-70 x 15-25	marine, attached to worm (Polychaeta: nerillid (<i>Nerilla antennata</i>))	epizoic	Europe
<i>P. terebellae</i>	120	marine, attached to worm (Polychaeta:	epizoic (surface)	Europe

[type species as <i>Scyphidia</i>]		terebellid (<i>Terebella lapidaria</i>)		
Genus: <i>Riboscyphidia</i> (solitary, cylindrical barrel-shape, sometimes with collar, broad disc-like basal scopula, flat epistomial disc, peristomial lips (epistyliform), telotrochs disc-shaped)				
<i>S. adunconucleata</i> (syn. <i>Scyphidia</i>)	75	marine, attached to fish (Pleuronectiformes: pleuronectid (European plaice))	epizoic (surface)	Scotland
<i>R. arctica</i> (syn. <i>Scyphidia</i>)	62-84 x 36-42	marine, attached to fish (Scorpaeniformes: cottid (butterfly sculpin, longhorn sculpin), liparid (snailfish); Salmoniformes: salmonid (Atlantic salmon, brown trout))	epizoic (gills)	North Atlantic, Pacific
<i>R. salmonis</i>	24-62 x 14-46	marine, attached to fish (Salmoniformes: salmonid (brown trout, brook trout))	epizoic	Europe
<i>R. scorpenae</i> [type species as <i>Scyphidia</i>]	53	marine, attached to fish (Scorpaeniformes: scorpaenid (scorpionfish))	epizoic (gills)	Europe
<i>R. siluri</i> (syn. <i>Scyphidia</i>)		marine, attached to fish (Siluriformes: silurid (unspecified catfish))	epizoic	Ukraine
Genus: <i>Scyphidia</i> (solitary, cylindrical bodies, broad disc-like basal scopula, adoral spiral making one turn around epistomial disc with peristomial lip (epistyliform), aboral locomotory fringe only in telotroch swarmer)				
<i>S. acanthoclini</i>	32-60 x 24-46	freshwater, attached to fish (Ovalentaria: plesiopid (New Zealand rockfish))	epizoic	New Zealand
<i>S. ambigua</i>	65	freshwater, attached to moss (<i>Sphagnum</i>)	epiphytic	Europe
<i>S. amphibiarum</i>	76 x 33	freshwater, attached to green algae (<i>Pediastrum</i>) and amphibians (Anura: ranid (common frog, tadpoles))	epiphytic, epizoic	Eurasia
<i>S. annulata</i>	80	freshwater, attached to algae	epiphytic	Europe
<i>S. baninae</i>	38-58 x 27-46	brackish water, attached to fish (Clupeiformes: alosid (Caspian shad))	epizoic (skin)	Russia
<i>S. beebei</i>		freshwater	free-living	Europe
<i>S. constricta</i> (syn. <i>Scopulata</i>)	33-80 x 20-34	freshwater, attached to fish (Cichliformes: cichlid (Mozambique tilapia) and worms (Annelida: naidid (<i>Nais</i>))	epizoic (skin)	Africa, Europe
<i>S. coronalis</i>		freshwater	free-living	Europe
<i>S. craterellus</i>	6	freshwater, attached to algae	epiphytic	Europe
<i>S. cyclopiscola</i>		freshwater	free-living	Europe
<i>S. cypris</i>		freshwater	free-living	Europe
<i>S. delphinicola</i>		freshwater	free-living	Europe
<i>S. dentata</i> (syn. <i>Scyphidiella</i>)		freshwater, attached to beetles (Coleoptera: hydrophilid (<i>Helochaeres</i>))	epizoic	Eurasia
<i>S. dermatata</i> (syn. <i>Scopulata</i>)	46-61 x 25-38	marine, attached to fish (Characiformes: alestid (sharptooth tetra); Cichliformes: cichlid (Mozambique tilapia, redbreast tilapia, banded tilapia, southern mouthbrooder); Cypriniformes: cyprinid (threespot barb); Osteoglossiformes: mormyrid (bulldog))	epizoic (skin)	Africa
<i>S. discostyla</i>	90	freshwater, attached to worm (Annelida: naidid (<i>Nais</i>))	epizoic	Europe
<i>S. dioxecola</i>		freshwater	free-living	Europe
<i>S. doliaris</i>	31-42 x 55-60	freshwater, attached to fish (Cypriniformes: cyprinid (Eurasian carp))	epizoic (skin)	Russia
<i>S. epibranchialis</i> (syn. <i>Scopulata</i>)	27-40 x 20-27	freshwater, Cichliformes: cichlid (Mozambique tilapia, southern mouthbrooder); Perciformes: centrarchid (smallmouth bass))	epizoic (skin, gills)	Africa

<i>S. fasticens</i>		freshwater	free-living	Europe
<i>S. fromentellii</i>		freshwater, attached to plants (<i>Sida</i>) and invertebrates (Branchiopoda: daphniid (<i>Daphnia pulex</i>); Amphipoda: gammarid (<i>Gammarus pulex</i>); Copepoda: cyclopoid (<i>Cyclops</i>))	epiphytic, epizoic	North America
<i>S. gammaricola</i>	25	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus pulex</i>))	epizoic	Europe
<i>S. haemopsis</i>		freshwater, attached to leech (Hirudinea: haemopid (<i>Haemopsis sanuisuga</i>))	epizoic	Eurasia
<i>S. helobdellae</i> (syn. <i>Scyphidiella</i>)		freshwater, attached to leech (Hirudinea: glossiphoniid (<i>Helobdella stagnalis</i>))	epizoic	Europe
<i>S. hirudineorum</i>		freshwater, attached to leeches (unspecified)	epizoic	Europe
<i>S. inclinans</i>	50-56	freshwater, attached to oligochaetes (Clitellata: tubificid (<i>Nais</i>))	epizoic	North America
<i>S. indica</i>	52 x 25	freshwater, attached to water fleas (Branchiopoda: daphniid (<i>Daphnia</i>))	epizoic	Eurasia
<i>S. inquilina</i>		freshwater	free-living	Europe
<i>S. limacina</i>		freshwater, attached to snails (Gastropoda: planorbid (<i>Planorbis</i>))	epizoic	North America
<i>S. lumbriculi</i> (syn. <i>Rhabdostyla</i>)	70	freshwater, planktonic and attached to oligochaete (Clitellata: lumbriculid (<i>Lumbriculus</i>))	free-living, epizoic	Europe
<i>S. marioni</i> (syn. <i>Mantoscaphidia</i>)	63-128 x 26-69	marine, attached to limpet (Gastropoda: nacellid (<i>Nacella delesserti</i>))	gills	Southern Ocean
<i>S. odontides</i>		freshwater	free-living	Europe
<i>S. ophidonais</i>		freshwater	free-living	Europe
<i>S. ostracodarum</i>		freshwater, attached to invertebrates (Ostracoda: notodromadid (<i>Notodromas monachi</i>))	epizoic	North America
<i>S. ovata</i>	34-42	freshwater, planktonic and attached to worm (Annelida: unspecified)	free-living, epizoic	Europe
<i>S. perezuzae</i>	50-60 x 50-70	marine, attached to fish (Scorpaeniformes: scorpaenid (black-banded rockfish))	epizoic (skin)	China
<i>S. periscelis</i>	19	freshwater	free-living	Europe
<i>S. planorbicola</i>		freshwater	free-living	Europe
<i>S. podurae</i>		freshwater	free-living	Europe
<i>S. polyphonicola</i>		freshwater	free-living	Europe
<i>S. prosternans</i>	15	freshwater	free-living	Europe
<i>S. ranae</i>		freshwater, attached to amphibians (Anura: ranid (common frog))	epizoic	Eurasia
<i>S. rhizopoda</i> (syn. <i>Epistylis</i>)	33-51	freshwater	free-living	Europe
<i>S. rugosa</i> [type species]	90-100 x 45	freshwater, attached to inanimate substrates, detritus, and moss (<i>Sphagnum</i>)	free-living, epiphytic	Eurasia
<i>S. scorpaenae</i>	53	marine, attached to fish (Scorpaeniformes: scorpaenid (unspecified <i>Scorpaena</i> sp.))	epizoic	Russia
<i>S. slavnicola</i>		freshwater	free-living	Europe
<i>S. spionicola</i>	45-65	marine, attached to worm (Annelida: spionid (<i>Pygospio</i>))	epizoic	Atlantic
<i>S. temporaria</i>		freshwater, attached to amphibians (Anura: ranid (common frog))	epizoic	Eurasia
<i>S. terebellidis</i>	45-55	marine, attached to worm (Annelida: unspecified)	epizoic	Eurasia
<i>S. trituri</i>		freshwater, attached to amphibian	epizoic	Eurasia

		(Urodela: salamandrid (smooth newt))		
<i>S. turbinata</i>		freshwater, attached to inanimate substrates and plants (<i>Lemna</i>)	free-living, epiphytic	Europe
<i>S. urnulea</i>		freshwater	free-living	Europe
<i>S. variabilis</i> (syn. <i>Rhabdostyla</i>)	60-90	marine, attached to worm (Annelida: terebellid (<i>Terebella</i>))	epizoic	Europe
<i>S. vascelloides</i>		freshwater	free-living	Europe
<i>S. vorticelloides</i>		freshwater	free-living	Europe
Family: Termitophryidae				
Genus: <i>Termitophrya</i> (body inverted cone-shaped, scopula forms unique pad-like disc, endocommensals of termites)				
<i>T. africana</i> [type species]	110-200	terrestrial, in termites (Isoptera: termitid (<i>Jugositermes tuberculatus</i> , and possibly <i>Astalotermes</i> , <i>Phoxotermes</i>))	endozoic (hindgut)	Africa
Family: Ophryidiidae				
Genus: <i>Gerda</i> (solitary, elongate bulbous body in gelatinous/mucilaginous case, no basal scopula, sausage-shaped macronucleus)				
<i>G. annulata</i> (syn. <i>Scyphidia</i>)	80	freshwater, attached to algae and plants (<i>Ruppia</i>)	free-living, epiphytic	Europe, North America
<i>G. fixa</i>	100	freshwater, attached to plants (<i>Myriophyllum</i>)	free-living, epiphytic	Europe
<i>G. glans</i> (syn. <i>G. sigmoides</i> , <i>vernalis</i> , <i>Ophrydium</i> , <i>O. boreale</i> , <i>lemnae</i>) [type species]	60-200	terrestrial and freshwater, attached to detritus, filamentous algae, mosses (<i>Sphagnum</i>) and plants (<i>Lemna</i>)	free-living, epiphytic	Europe, North America
<i>G. inclinans</i>		freshwater	free-living	Europe
<i>G. picta</i> (syn. <i>Ophionella</i>)		freshwater, attached to plants (<i>Myriophyllum spicatum</i> , <i>Anacharis</i>)	free-living	Europe
Genus: <i>Ophrydium</i> (colonies in jelly-like mass, colony solid, zooids often with green zoochlorellae, zooids with long posterior spines, peristomial ciliary wreath with 1½-2½ turns)				
<i>O. adae</i>	225-400 x 35-50	freshwater	free-living	Eurasia
<i>O. caudata</i> (syn. <i>Astylozoon</i> , <i>Gerda</i>)		freshwater (planktonic)	free-living	Europe
<i>O. crassicaule</i>	115-280 x 18-45	freshwater, planktonic and attached to inanimate substrates, filamentous algae, and submerged plants (<i>Ceratophyllum</i>)	free-living, epiphytic	Eurasia
<i>O. ectatum</i>	225-400	freshwater	free-living	Europe
<i>O. eichornii</i> (syn. <i>O. problematicum</i> , <i>versatile</i> var. <i>hyalinum</i>)	160-300 x 25-50	freshwater	free-living	Asia
<i>O. eutrophicum</i>	250-350 x 25-40	freshwater, planktonic and attached to inanimate substrates, and plants (stoneworts and <i>Phragmites</i>)	free-living, epiphytic	Europe
<i>O. fixa</i> (syn. <i>Gerda</i>)	135-150	freshwater, attached to plants (<i>Myriophyllum</i>)	free-living, epiphytic	Eurasia
<i>O. flexile</i>	90-160	freshwater	free-living	Asia
<i>O. hyalinum</i>	180-300 x 25-30	freshwater	free-living	Eurasia
<i>O. insolitum</i>	130 x 20	freshwater	free-living	Europe
<i>O. naumanni</i>	40-50 x 10	freshwater (eu planktonic)	free-living	Europe, South America?
<i>O. ophrydiiiformis</i>	220-260 x 36-40	freshwater	free-living	Eurasia
<i>O. pictum</i> (syn. <i>Ophionella</i>)	160	freshwater, attached to plants (<i>Myriophyllum</i>)	epiphytic	Europe
<i>O. sessile</i>	280-320 x 55-80	freshwater, attached to inanimate substrates and submerged plants (<i>Elodea</i> , <i>Myriophyllum</i>)	free-living, epiphytic	Europe, Americas
<i>O. sigmoides</i> (syn. <i>Gerda</i>)	135-150	freshwater	free-living	Europe
<i>O. vernale</i> (syn. <i>Gerda</i>)	250	freshwater	free-living	Europe
<i>O. versatile</i> [type species as]	300-600 x 20-40	freshwater, planktonic and attached to submerged algae (<i>Chara</i>), plants	free-living, epiphytic, epizoic	Europe, America

<i>Vorticella</i>]		(<i>Myriophyllum</i> , <i>Potamogeton</i> , <i>Phragmites</i> , <i>Chara</i> , <i>Anacharis</i>) and mussels (<i>Bivalvia</i> : unspecified)		
Family: Opisthonectidae				
Genus: <i>Opisthonecta</i> (free-swimming, with strongly developed epistomial membrane, truncated conical-shape, broad base, aboral ciliary wreath with strongly argentophilic granules on one side, trochal band ciliated)				
<i>O. bivacuolata</i>	140-180	freshwater	free-living	Europe
<i>O. dubia</i>	80-100	freshwater (planktonic)	free-living	Europe
<i>O. henneguyi</i> (syn. <i>Telotrochidium</i>) [type species]	90-170 x 80-130	freshwater (planktonic)	free-living	Eurasia, America
<i>O. patula</i> (possible syn. of <i>O. henneguyi</i>)	120-150	freshwater (planktonic)	free-living	Europe
<i>O. minima</i>	90-120	freshwater (planktonic)	free-living	Europe
Genus: <i>Telotrochidium</i> (lacking epistomial membrane, very small scopula, aboral ciliary wreath in zooids and telotrochs, with strong argentophilic granules on both sides of ciliary girdle, trochal band ciliated)				
<i>T. crateriformis</i> [type species] (syn. <i>Vorticella vaga</i>)	100	freshwater (planktonic)	free-living	Europe
<i>T. cylindricum</i>	130-170	freshwater	free-living	Europe
<i>T. elongatum</i>	80-145	freshwater (planktonic)	free-living	Europe
<i>T. johanninae</i>	60-70	freshwater (planktonic)	free-living	Europe
<i>T. matiense</i> (syn. <i>Opisthonecta</i>)	45-73 x 25-40	freshwater and wastewater	free-living	Europe
<i>T. matthaii</i>	145 x 108	freshwater (planktonic)	free-living	Europe
<i>T. nathei</i>	100	freshwater, planktonic	free-living	India

Stalked sessiline peritrichs have been allocated to 7 main families:

- The family Epistylididae contains numerous species whose zooids form noncontractile stalks that are often branched to form colonies. They often contain a retractile peristomial lip encircling a wide elevated peristomial disc, and are found attached to many diverse aquatic substrates, both inanimate and living (plants and animals). The family contains 8 genera: *Apiosoma* (syn. *Cordylosoma*, *Glossatella*, *Scopulata*), *Campanella*, *Epistylis* (syn. *Allomeron*, *Digitalina*, *Indosphaera*, *Mespilina*, *Myrtilina*, *Nidula*, *Orthochona*), *Foissnerella*, *Heteropolaria*, *Orborhabdostyla*, *Pseudepistylis*, and *Rhabdostyla* (syn. *Opisthostyla*). [Recent molecular studies on several *Campanella* and *Rhabdostyla* spp. have suggested the erection of 2 new families (Campanellidae and Rhabdostylidae), but more inclusive studies are required].
- The family Operculariidae also contains species with zooids forming noncontractile stalks, but they have well developed thecae and unique epistomial discs with anterior opercula. They are usually found as epibionts on aquatic insects and arthropods and have been allocated to 7 genera: *Ballodora*, *Opercularia* (syn. *Cochlearia p.p.*, *Discotheca*, *Kindella*, *Operculina*, *Valvularia*), *Operculariella*, *Orbopercularia* (syn. *Serioscyphus p.p.*, *Syncyathella*), *Orbopyxidiella* (syn. *Ampullaster*), *Propyxidium* (syn. *Pyxidiella*, *Pyxidium*), and *Triadopercularia*.
- The family Vorticellidae contains species with zooids mounted on prominent stalks as solitary individuals or as branched colonies. The stalks have central myonemes which contracts in a zigzag or spiral fashion when disturbed. They are prevalent in aquatic habitats where they attach to inanimate objects, plants or animals. The family contains over 20 genera: *Apocarchesium*, *Baikalaster*, *Baikalonis*, *Carchesium*, *Cotensita*, *Entziella*, *Epicarchesium*, *Grainis*, *Intranstylum*, *Parazoothamnium*, *Pelagovorticella*, *Piesika*, *Planeticovorticella*, *Pseudocarchesium*, *Pseudovorticella*, *Ruthiella*, *Spinivorticella*, *Systylis*, *Tucolesca*, *Vorticella* (syn. *Convallarina*, *Craterina p.p.*, *Diceratella p.p.*, *Ecclissa p.p.*, *Erythroptosis*, *Kerobalana*, *Ophyidia p.p.*, *Rinella*, *Spastosatyla*, *Vorticelloptosis*) and *Vorticellides*.
- The family Zoothamniidae contains solitary and colonial species with branched stalks that contract in a zigzag fashion, the shared myoneme (spasmoneme) being continuous making the entire colony contractile. Some 8 genera are recognized: *Haplocaulus* (syn. *Monintranstylum*), *Craspedomyoschiston*, *Mesothamnium*, *Myoschiston*, *Pseudohaplocaulus*, *Zoothamnioides*, *Zoothamnium*, and *Zoothamnopsis*.
- The family Bezedniellidae contains a few species whose zooids have noncontractile stalks and laterally displaced peristomes forming curved cylindrical trunks. They are found attached to ostracods and 2 genera are recognized: *Bezedniella* (colonial zooids on long branched stalks) and *Nuchterleinella* (solitary zooids on short stalks).
- The family Usconophryidae contains 2 unusual genera (*Cyclodonta*, *Usconophrys*) whose zooids occur in flexible loricae with simple apertures lacking closure structures.
- The family Rovinjellidae contains a single *Rovinjella* sp. whose colonial zooids occur in groups within unique loricae with wide apertures and bipartite stalks.

STALKED PERITRICHS				
Species	Trophont size (µm)	Habitat/Hosts	Life-style [disease]	Distribution
Family Epistylididae				
Genus <i>Apiosoma</i> (solitary, elongate conical body, circular scopula sometimes with very short stalk, often lobed/split into ramiform projections, compact posterior macronucleus, adoral spiral about one turn, infundibular fringe with more than half a turn, epizoic on fish or amphibia)				
<i>A. alburni</i>	42 x 29	freshwater, attached to fish (Cypriniformes: cyprinid (common bleak))	epizoic (gills)	Europe
<i>A. amoebae</i> (syn. <i>A. cryptonucleata</i> , <i>Glossatella</i> , <i>G. conica</i> , <i>Scyphidia</i>)	21-80 x 12-44	freshwater, attached to fish (Cypriniformes: cyprinid (grass carp, Eurasian carp, silver carp); Perciformes: latid (Nile perch); Scorpaeniformes: gasterosteid (three-spined stickleback))	epizoic (gills, skin)	Africa, Europe
<i>A. amurensis</i>		freshwater: attached to fish (Cypriniformes: leuciscid (<i>Phoxinus</i>))	epizoic	Russia
<i>A. baikalensis</i>	65 x 40	freshwater, attached to fish (unspecified)	epizoic (skin, gills)	Russia
<i>A. baninae</i>	40-60 x 25-35	freshwater, attached to fish (Cypriniformes: cyprinid (common dace, ide))	epizoic (skin)	Europe
<i>A. baueri</i> (syn. <i>Glossatella</i>)	29-58 x 20-40	freshwater, attached to fish (Esociformes: esocid (northern pike); Perciformes: percid (European perch))	epizoic (skin)	Russia
<i>A. basiramosa</i> (syn. <i>Glossatella</i>)	20-41 x 11-20	freshwater, attached to fish (Cypriniformes: xenocyprinid (Amur threelips))	epizoic (gills)	Russia
<i>A. campanulatum</i> (syn. <i>Glossatella</i>)	22-68 x 15-32	freshwater, attached to fish (Cypriniformes: cyprinid (common roach); Perciformes: percid (European perch, Eurasian ruffe, zander))	epizoic (skin)	Russia
<i>A. carpelli</i>	21-54 x 9-22	freshwater, attached to fish (Cypriniformes: cyprinid (crucian carp, Eurasian carp))	epizoic (skin, gills)	Russia
<i>A. caulata</i>	46-74 x 31-61	freshwater, attached to fish (Cypriniformes: cyprinid (river sardine))	epizoic (skin, gills)	Africa
<i>A. compacta</i>	80-85 x 30-35	freshwater, attached to fish (Cypriniformes: leuciscid (common minnow))	epizoic (gills)	Europe
<i>A. conica</i> (syn. <i>Glossatella</i>)	22-79 x 14-38	freshwater, attached to fish (Cichliformes: cichlid (redbelly tilapia); Scorpaeniformes: gasterosteid (unspecified sticklebacks))	epizoic (gills)	Africa, Russia
<i>A. constricta</i>	36-60 x 28-46	freshwater, attached to fish (Characiformes: alestid (sharptooth tetra); Cichliformes: cichlid (redbreast tilapia, banded tilapia, Mozambique tilapia, southern mouthbrooder); Cypriniformes: cyprinid (threespot barb); Osteoglossiformes: mormyrid (bulldog); Perciformes: percid (European perch))	epizoic (skin)	Africa, Eurasia
<i>A. cotti</i> (syn. <i>Glossatella</i> , <i>G. tintinnabulum</i> var. <i>cotti</i>)	40-75 x 20-34	freshwater, attached to fish (Cypriniformes: cyprinid (gudgeon); Scorpaeniformes: cottid (common bullhead))	epizoic (gills)	Europe
<i>A. curvinucleata</i>	114-172 x 31-51	freshwater, attached to fish (Cichliformes: cichlid (Mozambique tilapia))	epizoic (skin)	Africa
<i>A. dalli</i> (syn. <i>Glossatella</i>)	37-51 x 27-33	freshwater, attached to fish (Esociformes: esocid (Alaska blackfish))	epizoic (skin)	Russia
<i>A. dermatum</i>	40-61 x 25-38	freshwater, attached to fish	epizoic (skin)	South Africa

		(Characiformes: alestid (sharptooth tetra); Cichliformes: cichlid (redbreast tilapia, banded tilapia, Mozambique tilapia, southern mouthbrooder); Cypriniformes: cyprinid (threespot barb); Osteoglossiformes: mormyrid (bulldog))		
<i>A. doliaris</i> (syn. <i>Glossatella</i>)	27-52 x 17-36	freshwater, attached to fish (Cypriniformes: cyprinid (common rudd); Perciformes: latid (Nile perch))	epizoic (gills)	Russia, Africa
<i>A. epibranchialis</i> (syn. <i>Scopulata</i>)	34-50 x 23-37	freshwater, attached to fish (Cichliformes: cichlid (mango tilapia, Mozambique tilapia, southern mouthbrooder); Perciformes: centrarchid (smallmouth bass), latid (Nile perch))	epizoic (skin)	Africa
<i>A. esconium</i>		freshwater, attached to fish (unspecified)	epizoic	Russia
<i>A. extensa</i>	80-85 x 30-35	freshwater, attached to fish (Cypriniformes: leuciscid (common minnow))	epizoic (gills)	Europe
<i>A. filiformis</i>	50 x 25	freshwater, attached to fish (Cypriniformes: leuciscid (common minnow))	epizoic (gills)	Europe
<i>A. fungiformis</i>	25-54 x 22-36	freshwater, attached to fish (Cypriniformes: cyprinid (asp))	epizoic	Eurasia
<i>A. gasterostei</i> (syn. <i>Epistylis</i> , <i>Scyphidia</i>)	40-70 x 22-34	freshwater, attached to fish (Scorpaeniformes: gasterosteid (three-spined stickleback))	epizoic (gills)	Europe
<i>A. gigantea</i> (syn. <i>Glossatella</i>)	86-93 x 41-45	freshwater, attached to fish (unspecified)	epizoic	Europe
<i>A. glabra</i> (syn. <i>Glossatella</i> , <i>Cordylosoma</i>)	70-80	freshwater, attached to fish (unspecified) and amphibians (Urodela: salamandrid (crested newt))	epizoic (skin)	Europe
<i>A. gobionis</i>	32-55 x 18-28	freshwater, attached to fish (Cypriniformes: cyprinid (gudgeon, common roach))	epizoic (skin, gills)	Europe
<i>A. guhli</i>	50-55 x 28-30	freshwater, attached to fish (Scorpaeniformes: gasterosteid (ninespine stickleback))	epizoic (gills)	Europe
<i>A. kesselri</i>	30 x 26	freshwater, attached to fish (unspecified)	epizoic (gills)	Russia
<i>A. leuciscus</i>	34-45 x 25-40	freshwater, attached to fish (Cypriniformes: cyprinid (common rudd, common roach))	epizoic (skin, gills)	Europe
<i>A. lomi</i>	56 x 33	freshwater, attached to fish (Cypriniformes: cyprinid (dace))	epizoic (gills)	Europe
<i>A. longiciliaris</i>	33-50 x 11-20	freshwater, attached to fish (Esociformes: esocid (northern pike))	epizoic (gills)	Russia
<i>A. lopuchinae</i>	37-39 x 15-17	freshwater, attached to fish (Cypriniformes: cyprinid (common roach))	epizoic	Russia
<i>A. lotae</i>	16 x 5	freshwater, attached to fish (unspecified)	epizoic (gills)	Russia
<i>A. matthesi</i>	65-106 x 34-50	freshwater, attached to fish (Cypriniformes: cyprinid (chub))	epizoic (skin)	Europe
<i>A. maxima</i>	70-100 x 24-60	freshwater, attached to fish (Cypriniformes: cyprinid (dace, chub))	epizoic (gills)	Europe
<i>A. megamicronucleata</i> (syn. <i>Glossatella</i>)	30-42 x 18-30	freshwater, attached to fish (Esociformes: esocid (northern pike); Gadiformes: lotid (burbot); Siluriformes: silurid (wels catfish))	epizoic (skin)	Russia
<i>A. micralesti</i>	31-54 x 19-37	freshwater, attached to fish (Characiformes: alestid (sharptooth tetra))	epizoic (skin)	Africa
<i>A. micropteri</i> (syn. <i>Scyphidia</i>)	59 x 22	freshwater, attached to fish (Perciformes: centrarchid (largemouth bass, smallmouth bass); Esociformes: esocid (American	epizoic (skin, gills) [suffocation]	North America

		pickerel))		
<i>A. microstyla</i>	50 x 30	freshwater, attached to fish (Cypriniformes: cyprinid (common dace))	epizoic (gills)	Europe
<i>A. miniciliata</i>	36-40 x 16-20	freshwater, attached to fish (Perciformes: percid (Eurasian ruffe))	epizoic (gills)	Europe
<i>A. minimicronucleata</i>	16-43 x 16-32	freshwater, attached to fish (Esociformes: esocid (northern pike); Perciformes: percid (European perch))	epizoic (skin)	Russia
<i>A. minuta</i> (syn. <i>Glossatella</i>)	14-26 x 10-13	freshwater, attached to fish (Cypriniformes: cyprinid (Eurasian carp, barbel chub, sharpbelly, white Amur bream, common bleak), cobitid (pond loach); Siluriformes: bagrid (yellowhead catfish))	epizoic (skin)	Asia
<i>A. mothlapitsis</i>	20-38 x 11-26	freshwater, attached to fish (Cypriniformes: cyprinid (largescale yellowfish))	epizoic (skin)	Africa
<i>A. mucusani</i>	38 x 18	freshwater, attached to fish (unspecified)	epizoic (gills)	Russia
<i>A. nasalis</i> (syn. <i>Glossatella</i>)	28-60 x 14-24	freshwater, attached to fish (Cichliformes: cichlid (southern mouthbrooder); Cypriniformes: acheilognathid (Khanka spiny bitterling), cyprinid (goldfish, Chinese lake gudgeon, Amur ide), gobionid (Cherskii's thicklip gudgeon))	epizoic (skin, gills)	Russia, Africa
<i>A. obliqua</i>	29-54 x 17-34	freshwater, attached to fish (Cypriniformes: cyprinid (redeye labeo))	epizoic (skin)	Africa
<i>A. olae</i>	37-69 x 19-24	freshwater, attached to fish (Cypriniformes: cyprinid (common roach, common bleak, ide))	epizoic	Russia
<i>A. paracotti</i>	50 x 33	freshwater, attached to fish (unspecified)	epizoic (gills)	Russia
<i>A. peculiariformis</i> (syn. <i>Glossatella</i>)	31-44 x 15-18	freshwater, attached to fish (Scorpaeniformes: cottid (slimy sculpin))	epizoic	Russia
<i>A. phiala</i>	22-50 x 15-34	freshwater, attached to fish (Cichliformes: cichlid (Mozambique tilapia, southern mouthbrooder); Cypriniformes: cyprinid (slender barb, threespot barb, straightfin barb, matemba, redeye labeo, Orange River mudfish, river sardine))	epizoic (skin, gills)	Africa
<i>A. phoxini</i>	36-55 x 19-25	freshwater, attached to fish (Cypriniformes: leuciscid (common minnow))	epizoic (skin, gills)	Europe
<i>A. piscicola</i> (syn. <i>A. magna</i> , <i>Glossatella</i> , <i>G. cyprini</i> , <i>cylindriformis</i>) [type species]	32-110 x 13-50	freshwater, attached to fish (Cichliformes: cichlid (redbreast tilapia, redbelly tilapia, Mozambique tilapia, southern mouthbrooder); Cypriniformes: cyprinid (grass carp, black carp, silver carp, redbfin, straightfin barb, threespot barb, redeye labeo); Esociformes: esocid (northern pike); Osteoglossiformes: mormyrid (bulldog); Perciformes: centrarchid (smallmouth bass), latid (Nile perch), percid (European perch); Salmoniformes: salmonid (Atlantic salmon, brown trout, brook trout))	epizoic (gills, skin) [white spots]	Eurasia, North America, South Africa
<i>A. poteriformis</i> (syn. <i>Glossatella</i>)	33-57 x 14-27	freshwater, attached to fish (Cypriniformes: nemacheilid (stone loach); Perciformes: latid (Nile perch))	epizoic (gills, skin)	Russia, Africa
<i>A. pseudopiscicola</i>	60 x 20	freshwater, attached to fish (Cypriniformes: cyprinid (crucian carp))	epizoic (mouth cavity)	Europe
<i>A. pyriformis</i> (syn. <i>Glossatella</i>)	38-47 x 18-21	freshwater, attached to fish (Cypriniformes: cyprinid (roho labeo, catla, mrigal carp, reba carp))	epizoic (skin)	India

<i>A. robusta</i> (syn. <i>Glossatella</i>)	42-45 x 22-37	freshwater, attached to fish (Esociformes: esocid (Alaska blackfish))	epizoic (gills)	Russia
<i>A. schulmani</i>	23-62 x 14-36	freshwater, attached to fish (Gadiformes: lotid (burbot))	epizoic	Russia
<i>A. siewingi</i>	40 x 20	freshwater, attached to fish (Cypriniformes: leuciscid (common minnow))	epizoic (gills)	Europe
<i>A. tenera</i>	34-57 x 20-32	freshwater, attached to fish (Cypriniformes: cyprinid (Eurasian carp))	epizoic	Russia
<i>A. tintinnabulum</i> (syn. <i>Glossatella</i> , <i>Spirochona</i>)	30-43	freshwater, attached to amphibian (Urodela: salamandrid (unspecified salamander))	epizoic	Europe
<i>A. tretzli</i>	35-38 x 22-24	freshwater, attached to fish (Cypriniformes: cyprinid (sunbleak, common chub))	epizoic (gills)	Europe
<i>A. triangularis</i> (syn. <i>Glossatella</i>)	52-71	freshwater, attached to fish (Cypriniformes: cyprinid (golden shiner, common shiner, creek chub); Perciformes: percid (yellow perch))	epizoic (gills, nares, fins)	Canada
<i>A. usckani</i>	54 x 18	freshwater, attached to fish (unspecified)	epizoic (gills)	Russia
<i>A. viridis</i>	33-91 x 14-45	freshwater, attached to fish (Cichliformes: cichlid (redbreast tilapia, banded tilapia, Mozambique tilapia, canary kurper, southern mouthbrooder))	epizoic (skin)	Africa
Genus: Campanella (prominent tubular stalks, branched, colonial, but branches terminate in single zooids, noncontractile without myonemes, adoral spiral with 4-6 turns, infundibular fringe with 2 turns, peristome with lip) (genus considered valid by some workers, while others regard it as a synonym of <i>Epistylis</i> , <i>Carchesium</i> , <i>Opercularia</i> , or a subgenus of <i>Epistylis</i>)				
<i>C. hanchuanensis</i>	140-165 x 100-131	freshwater, attached to plants (<i>Jussiaea repens</i>)	free-living, epiphytic	China
<i>C. ovata</i> (syn. <i>C. purneri</i> f. <i>ovata</i>)		freshwater	free-living	Europe
<i>C. purneri</i>		freshwater	free-living	Europe
<i>C. sinica</i>	125-240 x 80-120	freshwater, attached to plants	epiphytic	China
<i>C. umbellaria</i> (syn. <i>Hydra</i> , <i>Epistylis flavicans</i> , <i>grandis</i> , <i>liebmanni</i> , <i>liebermanni</i> , <i>tincta</i>)	105-305 x 86-135	freshwater, attached to inanimate substrates, detritus, plants and invertebrate animals (Gastropoda: lymnaeid (<i>Lymnaea</i>); Bivalvia: dreissenid (<i>Dreissenia polymorpha</i>); Isopoda: asellid (<i>Asellus aquaticus</i>))	free-living, epiphytic, epizoic	cosmopolitan
Genus Epistylis (prominent stalk, dichotomously branched bearing many zooids in colony, stalk noncontractile without myoneme, adoral spiral with 1-2 turns, infundibular fringe with about one turn, wide epistomial disc, zooid contractile with retractile peristomial lip, transverse silverline system, aboral ring of cilia on telotroch encircles apparent width of body)				
<i>E. acinosa</i> (syn. <i>Vorticella</i>)		freshwater	free-living	Europe
<i>E. acuminata</i>	bimorphic: microzooids 30-55 x 21-44; macrozooids 68-84 x 49-58	marine, attached to invertebrates (Decapoda: penaeid (<i>Penaeus orientalis</i>))	epizoic	China
<i>E. agrionis</i>	43	freshwater	free-living	Europe
<i>E. alpestris</i>	100-140	freshwater	free-living	Europe
<i>E. amphitae</i>		marine, attached to unknown crustaceans (' <i>Amphitae vallenti</i> ')	epizoic (pleopods)	Black Sea
<i>E. anaestica</i>		freshwater	free-living	Europe
<i>E. anastatica</i> (syn. <i>E. lacustris</i> , <i>nympharum</i> p.p., <i>stilleri</i> , <i>Vorticella</i> , <i>V. doliolum</i>)	44-130 x 20-62	freshwater, attached to aquatic plants (incl. hornwort <i>Ceratophyllum</i>) and invertebrates (Copepoda: cyclopid (<i>Cyclops agilis</i> , <i>Mesocyclops albidus</i> , <i>isabellae</i>); Branchiopoda: cercopagidid (<i>Bythotrephes longimanus</i>), daphniid (<i>Daphnia pulex</i>), triopsid (<i>Lepidurus apus</i> , <i>hyalina</i>); Amphipoda: gammarid	free-living, epiphytic, epizoic	Eurasia, Africa, North America

		(<i>Gammarus roeselii</i>); Arachnida: unionicolid (<i>Unionicola crassipes</i>); and Decapoda: cambarid (<i>Cambarellus patzcuarensis</i>)		
<i>E. anilocrae</i> (syn. <i>Orthochona</i>)	50	marine, attached to invertebrate (Isopoda: cymothoid (<i>Anilocra</i>))	epizoic	Europe
<i>E. anodontae</i>		freshwater, attached to mussel (Bivalvia: unionid (<i>Sinanodonta lauta</i>))	epizoic (gills, muscle)	Asia
<i>E. anophelis</i>		freshwater, attached to mosquito larvae (Diptera: culicid (<i>Anopheles</i>))	epizoic	Europe
<i>E. apiosomae</i>		freshwater, attached to fish (Scorpaeniformes: cottid (unspecified sculpins) and also to their peritrichous ectocommensals (Ciliophora: epistylidid (<i>Apiosoma</i>))	epizoic (surface)	Europe
<i>E. arabica</i> (syn. <i>Vorticella</i>)		freshwater	free-living	Europe
<i>E. arcuata</i>	45	freshwater	free-living	Europe
<i>E. arenicolae</i>		marine	free-living	Europe
<i>E. articulata</i>	75	freshwater	free-living	Europe
<i>E. aselli</i>	25-40	freshwater, attached to invertebrates	epizoic	Asia
<i>E. astaci</i>		freshwater, attached to invertebrates (Decapoda: astacid (<i>Astacus astacus</i> , <i>fluviatilis</i> , <i>leptodactylus</i> , <i>Austropotamobius torrentium</i>))	epizoic (gills)	Europe
<i>E. autumnalis</i>	80	freshwater, attached to plants (<i>Lemna</i>)	epiphytic	Europe
<i>E. axile</i>		estuarine, attached to crabs (Decapoda: macrophthalmid (<i>Macrophthalmus japonicus</i>), sesarmid (<i>Chiromantes haematocheir</i>))	epizoic (setae, pleopods)	Asia
<i>E. azelicola</i>		freshwater, attached to inanimate substrates and invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>))	free-living, epizoic	Europe
<i>E. bagoi</i>		freshwater, attached to beetle (Coleoptera: curculionid (<i>Bagous cylindrus</i>))	epizoic	Europe
<i>E. balatonica</i>	90-100	freshwater, attached to mussel (Bivalvia: unionid (<i>Unio pictorum</i>))	epizoic	Europe
<i>E. barbata</i>	70-90	marine, attached to detritus	free-living	Europe
<i>E. bellis</i> (syn. <i>Vorticella</i>)		freshwater	free-living	Europe
<i>E. bimarginata</i>	36-93 x 15-39	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Carinogammarus roeselii</i> , <i>Gammarus</i>); crayfish (Decapoda: astacid (<i>Astacus astacus</i> , <i>fluviatilis</i>), cambarid (<i>Cambarellus patzcuarensis</i>))	epizoic (appendages, exoskeleton, gills)	Europe, North America
<i>E. branchiophila</i> (syn. <i>E. formosa</i>)	18-90 x 15-48	freshwater, attached to algae, caddisfly larvae (Trichoptera: phryganeid (unspecified); crayfish (Decapoda: cambarid (<i>Cambarellus patzcuarensis</i>), and parasitic copepods (Copepoda: lernaed (<i>Lernaea cyprinacea</i>))	epizoic	Africa, North America
<i>E. breviramosa</i>	40-60 x 25-30	freshwater, attached to invertebrates (Branchiopoda: bosminid (<i>Bosmina longirostris</i>), chydorid (<i>Alona affinis</i>), daphniid (<i>Daphnia</i>); Copepoda: cyclopid (<i>Cyclops</i>))	epizoic	Europe
<i>E. cactistyla</i>		marine, attached to crabs (Decapoda: macrophthalmid (<i>Macrophthalmus japonicus</i>), sesarmid (<i>Parasesarma pictum</i>), varunid (<i>Gaetice depressus</i> , <i>Hemigraspus penicillatus</i>) and shrimp	epizoic (gills)	Asia

		(Decapoda: upogebiid (<i>Upogebia major</i>))		
<i>E. caliciformis</i>	70-100	freshwater, attached to filamentous algae	free-living	?
<i>E. callinectes</i>	40-57 x 17-33	marine, attached to crabs (Decapoda: portunid (<i>Callinectes sapidus</i>))	epizoic	North America
<i>E. cambari</i>	50	freshwater, attached to crayfish (Decapoda: astacid (<i>Astacus leptodactylus</i>), cambarid (<i>Cambarus</i>))	epizoic (gills)	North America
<i>E. campanella</i>	35	freshwater	free-living	Europe
<i>E. carinogammari</i>	44-88 x 30-66	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Carcinogammarus</i>); Decapoda: cambarid (<i>Cambarellus patzcuarensis</i>))	epizoic	North America
<i>E. cauliculus</i>	10	freshwater, attached to invertebrates (Rotifera: collothecid (<i>Stephanoceros</i>), flosculariid (<i>Floscularia</i>))	epizoic	Europe
<i>E. cerviciformis</i>	70	freshwater	free-living	Europe
<i>E. chlorelligerum</i>	160-260 x 45-95	freshwater	free-living	Asia
<i>E. chrysemydis</i> (syn. <i>E. balatonica</i> , <i>polenici</i> , <i>Opercularia bimarginata</i> , <i>moldavica</i>)	120-220 x 55-110	freshwater (and activated sludge), attached to inanimate substrates, detritus, filamentous algae, submerged plants, invertebrate animals (<i>Trichoptera</i> caddisfly larvae) and vertebrate animals (Testudines: unspecified tortoises)	free-living, epiphytic, epizoic	Europe, America
<i>E. clampi</i>	35-70 x 20-35	marine, attached to inanimate substrates and crabs (Decapoda: portunid (<i>Callinectes sapidus</i>))	free-living, epizoic	North America, China
<i>E. collariata</i>		freshwater marshes	free-living	Europe
<i>E. complanata</i>		freshwater	free-living	Europe
<i>E. constricta</i> (syn. <i>Opercularia</i>)	130	freshwater, attached to butterfly pupae (Lepidoptera, unspecified)	epizoic	America
<i>E. coronata</i>	70-120	freshwater, attached to filamentous bacteria (<i>Sphaerotilus</i>)	free-living, epiphytic	Europe
<i>E. corymbosus</i>		freshwater	free-living	Europe
<i>E. crassicollis</i>	100	freshwater, attached to unspecified Entomostraca, and crayfish (Decapoda: astacid (<i>Astacus astacus</i> , <i>leptodactylus</i>))	epizoic	Europe
<i>E. crataegaria</i> (syn. <i>Vorticella</i>)		freshwater, attached to invertebrates (Hydrozoa: hydrid (<i>Hydra</i>))	epizoic	Europe
<i>E. culexi</i>		freshwater, attached to mosquito larvae (Diptera: culicid (<i>Culex pipiens</i>))	epizoic (surface)	Asia
<i>E. cyprinaceae</i>		freshwater, attached to parasitic copepod (Copepoda: lernaed (<i>Lernaea cyprinaceae</i>) of fish)	epizoic	Africa
<i>E. daphniae</i>	31-45 x 25-35	freshwater, attached to invertebrates (Branchiopoda: daphniid (<i>Daphnia magna</i>), moinid (<i>Moina macrocopa</i>); Copepoda: centropagid (<i>Boeckella triarticulata</i>))	epizoic	New Zealand
<i>E. diaptomi</i>		freshwater, attached to invertebrates (Copepoda: diaptomid (<i>Diaptomus</i>))	epizoic	
<i>E. digitalis</i> (syn. <i>Vorticella</i>)	60-120 x 20-40	freshwater, attached to invertebrates (Copepoda: cyclopid (<i>Cyclops agilis</i> , <i>Eucyclops serratulus</i>), canthocamptid (<i>Canthocampus</i>); Arachnida (unspecified mites))	free-living, epizoic	Eurasia, America
<i>E. dudekemi</i>	360	freshwater	free-living	?
<i>E. dupla</i>		freshwater	free-living	Europe
<i>E. elongata</i>	100	freshwater, attached to plants (<i>Lemna</i>) and clams (Bivalvia: mactrid (<i>Mactra quadrangularis</i>), venerid (<i>Ruditapes philippinarum</i> , <i>Meretrix meretrix</i>))	epiphytic, epizoic (gills)	Eurasia
<i>E. entzii</i>	107-190 x 80	freshwater (and activated sludge),	free-living,	Europe, America

		attached to inanimate substrates, detritus, mosses (<i>Fontinalis</i>), submerged plants, invertebrates (Gastropoda: planorbid (<i>Planorbis</i>); Bivalvia: unionid (<i>Unio pictorum</i>); Trichoptera (caddisfly larvae); and vertebrates (Testudines: unspecified tortoises)	epiphytic, epizoic	
<i>E. epibarnimiana</i>		freshwater, attached to parasitic copepods (Copepoda: lernaeid (<i>Lernaea barnimiana</i>) of fish)	epizoic	Africa
<i>E. epibioticum</i>	45-53	freshwater, attached to stalks of other colonial peritrichs (<i>Epistylis</i> , <i>Carchesium</i>)	epizoic	Eurasia
<i>E. epistyliformis</i> (syn. <i>Opercularia</i>)		freshwater, attached to woodlice (Isopoda: ligiid (<i>Ligidium agile</i> , <i>hynorum</i>) and crabs (Decapoda: carcinid (<i>Carcinus maenas</i>))	epizoic	Europe
<i>E. exilipes</i>		freshwater	free-living	Europe
<i>E. fastigata</i>	30	freshwater	free-living	Europe
<i>E. fastibilis</i>	50	freshwater	free-living	Europe
<i>E. fluitans</i>	160	freshwater (swamp)	free-living	?
<i>E. foissneri</i>	110-190 x 20-30	freshwater (lake)	free-living	China
<i>E. flabelliformis</i>	43	freshwater	free-living	Europe
<i>E. flectens</i>		freshwater	free-living	Europe
<i>E. flexistyla</i>		marine, attached to crabs (Decapoda: varunid (<i>Gaetice depressus</i>))	epizoic (pleopods)	Asia
<i>E. fugitans</i>	50-60	freshwater, attached to invertebrates (Branchiopoda: sidid (<i>Sida crystallina</i>))	epizoic	North America
<i>E. galea</i> (syn. <i>Vorticella</i> , <i>E. umbellata</i>)	160-225 x 50-70, plus macro- & micro-zooids	freshwater, attached to inanimate substrates, submerged plants (<i>Ceratophyllum</i> , <i>Utricularia</i> , <i>Typha</i> , <i>Iris</i>)	free-living, epiphytic	Europe
<i>E. gammari</i>	26-74 x 11-52	freshwater and marine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus oceanicus</i> , <i>salinus</i> , <i>tigrinus</i>); Decapoda: cambarid (<i>Cambarellus patzcuarensis</i>))	epizoic (antennae)	Europe, North America
<i>E. geleii</i>	45-50	freshwater, attached to mayfly larvae (Ephemeroptera: heptageniid (<i>Epeorus</i>))	epizoic	Europe
<i>E. halophila</i>	40	freshwater, attached to invertebrates (Branchiopoda: daphniid (<i>Daphnia pulex</i> , <i>longispina</i>))	epizoic	Europe
<i>E. harpacticola</i>	28-40	marine, attached to invertebrates (Copepoda: harpacticid (unspecified))	epizoic	Europe
<i>E. helenae</i>		freshwater, attached to invertebrates (Branchiopoda: chydorid (<i>Chydorus sphaericus</i>), daphniid (<i>Daphnia pulex</i> , <i>magna</i> , <i>obtusa</i> , <i>longispina</i> , <i>curvirostris</i> , <i>Ceriodaphnia pulchella</i> , <i>reticulata</i> , <i>laticauda</i> , <i>Simocephalus serratula</i> , <i>vetulus</i>), moinid (<i>Moina macropa</i> , <i>micrura</i>), sidid (<i>Diaphanosoma leuchtenbergianum</i>))	epizoic	North America
<i>E. helicostylum</i>		freshwater, attached to invertebrates (Ostracoda: cypridid (<i>Eucypris virens</i>))	epizoic (extremities)	Europe
<i>E. hentscheli</i>	100-235 x 35-80	freshwater, attached to inanimate substrates, and submerged plants	free-living, epiphytic	Eurasia
<i>E. hollandei</i>		freshwater, attached to moth larvae (Lepidoptera: crambid (<i>Nymphula nymphaeata</i>))	epizoic	Eurasia
<i>E. hospes</i>	125	freshwater	free-living	?
<i>E. humilis</i> (syn. <i>Opercularia</i>)	40-50	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus</i>); Ostracoda (unspecified))	epizoic	Europe

<i>E. inclinans</i>		freshwater	free-living	Europe
<i>E. invaginata</i>	60	freshwater, attached to beetle (Coleoptera: hydrophilid (<i>Hydrophilus</i>))	epizoic	Europe
<i>E. jaerae</i>		marine, attached to invertebrates (Isopoda: janirid (<i>Jaera marina</i>))	epizoic	Europe
<i>E. jaworowskii</i>	67	freshwater, attached to plants	epiphytic	Europe
<i>E. kolbi</i>	43-62 x 23-32	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Carinogammarus roeseli</i>))	epizoic	Europe
<i>E. lacustris</i>		freshwater, attached to inanimate substrates and aquatic insects (unspecified)	free-living, epizoic (surface)	Eurasia
<i>E. laxipes</i> (syn. <i>Vorticella</i>)	17-20	freshwater, attached to inanimate substrates and algae	free-living, epiphytic	Europe
<i>E. leucoa</i>	200	freshwater, attached to plants (<i>Carex</i>)	epiphytic	Europe
<i>E. longicaudatum</i>	35-61	freshwater	free-living	Europe
<i>E. longicorpora</i>	280-429 x 50-96	freshwater, attached to inanimate substrates, mussels (Bivalvia: unionid (<i>Sinanodonta lauta</i>) and fish (Cypriniformes: cyprinid (goldfish, Eurasian carp))	free-living, epizoic (mollusc shell, fish skin)	Eurasia
<i>E. longifila</i>		freshwater, attached to invertebrates (Copepoda: diaptomid (<i>Eudiaptomus zachariasii</i>))	epizoic	Europe
<i>E. longipes</i>	13	freshwater	free-living	Europe
<i>E. longistyla</i>		marine, attached to crabs (Decapoda: macrophthalmid (<i>Macrophthalmus japonicus</i>), sesarmid (<i>Parasesarma pictum</i>), varunid (<i>Gaetice depressus</i>))	epizoic (mouth, pleopods)	Asia
<i>E. magna</i>		freshwater, attached to parasitic copepod (Copepoda: lernaeid (<i>Lernaea cyprinacea</i>) on fish)	epizoic	Africa
<i>E. major</i> (nomen nudum, named but not described)		marine, attached to crabs (Decapoda: sesarmid (<i>Chiromantes haematocheir</i>))	epizoic (setae)	Asia
<i>E. microdiscum</i>	45-55 x 30-35	freshwater, attached to plants (Lemna minor) and invertebrates (Copepoda: cyclopoid (<i>Cyclops strenuus</i>))	epiphytic, epizoic (antennae)	Eurasia
<i>E. mirandella</i>	35	freshwater, attached to inanimate substrates and plants (<i>Lemna</i>)	free-living, epiphytic	Europe
<i>E. multicapitata</i> (syn. <i>Nidula</i>)		freshwater	free-living	Lake Baikal
<i>E. naisidicola</i>	7-10	freshwater, attached to worms (Tubificida: naidid (<i>Dero</i>))	epizoic	Europe
<i>E. niagarae</i>	48-196 x 30-131	freshwater, attached to invertebrates (Copepoda: cyclopoid (<i>Eucyclops serratulus</i>); Amphipoda: gammarid (<i>Gammarus roeseli</i>); Branchiopoda: daphniid (<i>Daphnia pulex</i> , <i>rosea</i> , <i>Ceriodaphnia reticulata</i> , <i>Scapholeberis mucronata</i>); Isopoda: asellid (<i>Asellus</i>); Decapoda: astacid (<i>Astacus leptodactylus</i> , <i>Austropotamobius torrentium</i>), cambarid (<i>Cambarellus patzcuarensis</i> , <i>Orconectes limosus</i>) and turtle shells (Testudines: chelydrid (unspecified snapping turtle), emydid (unspecified painted turtle))	epizoic (body surface)	North America
<i>E. nigrelli</i>	35-50 x 33	marine, attached to barnacles (Cirripedia: balanid (<i>Balanus eburneus</i>))	epizoic (mantle cavity)	North America
<i>E. nitocrae</i>		freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus tigrinus</i>))	epizoic	North America

<i>E. nympharum</i>	60-150 x 20-25	freshwater, attached to plants (<i>Lemna</i>) and invertebrate animals (Diptera: chironomid (midge larvae); Ephemeroptera: ephemerid (mayfly larvae); Trichoptera (caddisfly larvae); Coleoptera: dytiscid (<i>Agabus nitidus</i>); Copepoda: argulid (<i>Dolops ranarum</i>), cyclopid (<i>Cyclops</i> , <i>Macrocylops fuscus</i>), diaptomid (<i>Diaptomus gracilis</i>); Gastropoda: lymnaeid (<i>Lymnaea stagnalis</i>); Acari (unspecified mites)	epizoic	Eurasia, Africa
<i>E. ophidioidea</i>	dimorphic, 280-400	freshwater	free-living	Europe
<i>E. ovalis</i>		freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus tigrinus</i> , <i>pulex</i>); Decapoda: astacid (<i>Astacus fluviatilis</i>))	epizoic	Europe, North America
<i>E. ovum</i>	30-38	freshwater, attached to plants and invertebrates (Copepoda: cyclopid (<i>Cyclops strenuus</i>); Rotifera (unspecified); Branchiopoda: bosminid (<i>Bosmina</i>), daphniid (<i>Daphnia pulex</i>), leptodoriid (<i>Leptodora kindtii</i>))	epiphytic, epizoic	Europe
<i>E. parvannulata</i>		freshwater	free-living	Europe
<i>E. perrieri</i>		freshwater	free-living	Europe
<i>E. phoxini</i>		freshwater, attached to fish (Cypriniformes: leuciscid (common minnow))	epizoic	Europe
<i>E. plicatilior</i>		freshwater	free-living	Europe
<i>E. plicatilis</i> [type species]	70-162 x 25-50	freshwater, attached to inanimate substrates, detritus, submerged plants (<i>Lemna</i>), invertebrates (Amphipoda: gammarid (<i>Gammarus</i>); Copepoda: cyclopid (<i>Cyclops vernalis</i> , <i>bicuspidatus</i> , <i>Eucyclops agilis</i>); Isopoda: asellid (<i>Asellus</i>); Gastropoda (<i>Physa acuta</i> , <i>Radix japonica</i> , <i>Lymnaea</i>), Coleoptera (<i>Dytiscus</i> beetles), and amphibians (Anura (unspecified tadpoles))	free-living, epiphytic, epizoic	Eurasia, New Zealand, Americas
<i>E. podurae</i>		freshwater, attached to springtails (Poduromorpha: podurid (<i>Podura aquatica</i>))	epizoic	Europe
<i>E. polenici</i>	97-145	freshwater, attached to inanimate substrates and mollusc shells	free-living, epizoic	Eurasia
<i>E. procumbens</i> (syn. <i>E. rotans</i>)	60-140 x 30-70	freshwater (euplanktonic)	free-living	Eurasia, America
<i>E. pseudovum</i>		freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus</i>))	epizoic	Europe
<i>E. pygmaeum</i>	22-50 x 17-45	freshwater, attached to plants (<i>Bosmina</i>), diatoms (<i>Fragilaria</i>), and invertebrates (Copepoda: cyclopid (<i>Cyclops</i>); Ostracoda (unspecified); rotifers (Rotifera: brachionid (<i>Brachionus angularis</i>); Amphipoda: gammarid (unspecified); Branchiopoda: daphniid (<i>Daphnia hyalina</i> , <i>Ceriodaphnia</i>) and mayfly larvae (Ephemeroptera (unspecified))	epizoic	Eurasia, North America
<i>E. pyriformis</i>	100	freshwater, attached to crane-fly larvae (Diptera: tipulid (unspecified))	epizoic (surface)	Europe
<i>E. racemosa</i>	40-51	freshwater, attached to invertebrates (Copepoda: diaptomid (<i>Diaptomus</i>))	epizoic	Europe
<i>E. raikowi</i>	45-60 x 20-35	marine	free-living	China

<i>E. regularis</i> (syn. <i>Vorticella</i>)		freshwater, attached to inanimate substrates, Plants (<i>Myrophyllum</i> , <i>Lemna</i>) and invertebrates (Gastropoda: planorbid (<i>Planorbis contortus</i>))	free-living, epiphytic, epizoic	Europe
<i>E. rotans</i>		marine, attached to invertebrates (Isopoda: ligiid (<i>Ligia exotica</i>); Copepoda: cyclopid (unspecified))	epizoic (gills, carapace)	Asia
<i>E. rotatorium</i>	35	freshwater, attached to rotifers (Rotifera; brachionid (<i>Brachionus</i>))	epizoic	Europe
<i>E. salina</i>		freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus pulex</i>))	epizoic	North America
<i>E. scaralistyla</i>		marine, attached to shrimp (Decapoda: upogebiid (<i>Upogebia major</i>))	epizoic (setae)	Asia
<i>E. semiciculus</i>	79-172 x 32-88	freshwater, attached to crayfish (Decapoda: cambarid (<i>Procambarus clarkii</i>))	epizoic (pereopods, gills)	China
<i>E. sesarmae</i>		marine, attached to crabs (Decapoda: sesarmid (<i>Parasesarma pictum</i>))	epizoic (mouth, pleopods)	Asia
<i>E. sevastopoli</i>		marine, attached to crabs (Decapoda: grapsid (<i>Pachygrapsus marmoratus</i>))	epizoic (mouthparts)	Black Sea
<i>E. sommerae</i>	48-57 x 29-38	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus pulex</i>))	epizoic (legs)	Europe
<i>E. sphaerostyla</i>		aquatic, attached to invertebrates (Isopoda: sphaeromatid (<i>Gnorimosphaeroma</i>))	epizoic (gills)	Asia
<i>E. stammeri</i>	44-74 x 22-47	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Decapoda: cambarid (<i>Cambarellus patzcuarensis</i>))	epizoic	North America, Europe
<i>E. subcylindrica</i>	50-80	freshwater	free-living	Europe
<i>E. tenuistyla</i> (syn. <i>E. etenuistyla</i>)		freshwater, attached to crayfish (Decapoda: cambarid (<i>Procambarus clarkii</i>))	epizoic (pleopods)	Asia
<i>E. thienemanni</i>		freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus pulex</i> , <i>tigrinus</i>))	epizoic (gills)	North America
<i>E. tornatilis</i>		freshwater	free-living	Europe
<i>E. transvaalensis</i>	27-45 x 20-38	freshwater, attached to fish (Cichliformes: cichlid (Mozambique tilapia, southern mouthbrooder))	epizoic (skin)	South Africa
<i>E. tubificis</i> (syn. <i>Rhabdostyla</i>)	100	freshwater, attached to oligochaetes (Clitellata: tubificid (<i>Tubifex rivulorum</i>))	epizoic	Europe
<i>E. umbilicata</i>	40-60 x 21-33	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus</i>); Copepoda: cyclopid (<i>Cyclops</i>), worms (unspecified) and mosquito larvae (Diptera: culicid (unspecified))	epizoic	Europe
<i>E. urceolata</i>	120-190	freshwater, attached to mussels (Bivalvia: unionid (<i>Unio</i>), snails (Gastropoda: planorbid (<i>Planorbis</i>) and caddisfly larvae (Trichoptera (unspecified))	epizoic	Europe
<i>E. uyemurai</i>		marine	free-living	China
<i>E. vaginata</i>	60	freshwater	free-living	Europe
<i>E. vaginula</i>	60-125 x 20-55	freshwater, attached to inert substrates and plants (<i>Ceratophyllum</i>)	free-living, epiphytic	Eurasia
<i>E. variabilis</i>	40-96 x 22-47	freshwater, attached to inanimate substrates and crayfish (Decapoda: cambarid (<i>Cambarellus patzcuarensis</i>))	free-living, epizoic	Europe, North America
<i>E. vermicola</i>	50-60	freshwater (benthic), attached to worms (Oligochaeta (unspecified))	epizoic	Europe

<i>E. verticillata</i>	150	freshwater	free-living	Europe
<i>E. vestita</i> (syn. <i>Opercularia</i>)	80	freshwater, attached to plants	epiphytic	Europe
<i>E. violacea</i>	60-90	freshwater, attached to midge larvae (Diptera: chironomid (unspecified))	epizoic	North America
<i>E. vittata</i>	200	freshwater, attached to snails (Gastropoda: physid (<i>Physa</i>))	epizoic	Europe
<i>E. wenrichi</i>		freshwater, attached to mussels (Bivalvia: unionid (<i>Sinanodonta lauta</i>))	epizoic (shell)	Asia
<i>E. wuhanensis</i>	90-220	freshwater, attached to fish (Siluriformes: bagrid (yellowhead catfish) and parasitic copepods (Copepoda: lernaeid (<i>Lernaea</i> <i>cyprinacea</i>) parasitizing fish (Gobiiformes: oxudercid (Amur goby); Perciformes: centrarchid (bluegill))	epizoic (fish fins, copepod body surface)	Asia
<i>E. zschokkei</i> (syn. <i>Opercularia</i>)	50	freshwater, attached to invertebrates (Copepoda: cyclopid (<i>Cyclops</i>), canthocamptid (<i>Canthocamptus</i>); Amphipoda: gammarid (<i>Gammarus</i> <i>tigrinus</i>); Branchiopoda: macrothricid (<i>Acantholebris curvirostris</i>))	epizoic (appendages)	Europe
Genus: Foissnerella (colonial, stalked, bulbous stalks, branched, noncontractile, small colonies)				
<i>F. physonica</i>	42-51 x 34-38	freshwater, attached to invertebrates (Isopoda: sphaeromatid (<i>Gnorimosphaeroma noblei</i>))	epizoic	Eurasia
Genus: Heteropolaria (prominent stalk, branched, colonial, noncontractile without myoneme, adoral spiral with 1-1½ turns, peristome with lip, telotrochs flattened with aboral ring of cilia encircling apparent length of body)				
<i>H. horizontalis</i> [type species as <i>Eipstylis</i>]	46-50 x 25-29	marine, attached to barnacles (Cirripedia: balanid (<i>Balanus balanoides</i> , <i>balanus</i> , <i>crenatus</i> , <i>eburneus</i> , <i>amphitrite</i>))	epizoic (mantle cavity)	North America, Russia
<i>H. colisarum</i> (syn. <i>Epistylis</i>)	150-300 x 40-60	freshwater, attached to fish (Anabantiformes (unspecified gouramis); Perciformes: centrarchid (green sunfish); Siluriformes: ictalurid (channel catfish))	epizoic (skin) [red-sore disease]	East Asia, North America
<i>H. lwoffii</i> (syn. <i>Epistylis</i> , <i>Rhabdostyla cyprini</i>)	40-80 x 20-30 [4 stalk ecoforms]	freshwater, attached to fish (Cypriniformes: cyprinid (Eurasian carp, crucian carp, common bream, white bream, common roach, common rudd, gudgeon), nemacheilid (stone loach); Perciformes: percid (European perch, Eurasian ruffe, zander); Scorpaeniformes: cottid (European bullhead), gasterosteid (three-spined stickleback); Salmoniformes: salmonid (Atlantic salmon, brown trout))	epizoic (gills, skin)	Eurasia, North America
Genus Orborhabdostyla (solitary, short stalk, sometimes bent at base, noncontractile without myoneme, peristome with lip, discoidal-ellipsoidal macronucleus, transverse silverline system)				
<i>O. bromelicola</i>	50-75 x 13-18	freshwater, attached within tanks of bromeliads (<i>Guzmania musaica</i>)	free-living, epiphytic	Jamaica
<i>O. brevipes</i> (syn. <i>Epistylis</i> , <i>Rhabdostyla</i>)	80-90	freshwater, attached to fly larvae (Diptera (unspecified))	epizoic	Europe
<i>O. kahli</i> (syn. <i>Rhabdostyla</i>)	60	freshwater, attached to worms (Annelida: lumbriculid (<i>Lumbriculus</i>))	epizoic	Europe
Genus: Pseudepistylis (prominent stalk, branched, colonial, noncontractile, peristomial disc not on stalk, peristomial ciliary wreath makes < 2 turns, reticulate silverline system, telotrochs cylindrical)				
<i>P. paramphora</i>	170-285 x 110- 190	freshwater	free-living	China
Genus: Rhabdostyla (solitary, short stalk, sometimes bent at base, noncontractile without myoneme, peristome with lip, adoral spiral with about one turn, infundibular ring with almost half a turn, horseshoe-shaped macronucleus, transverse silverline system)				
<i>R. annularis</i> (syn. <i>Vorticella</i>)		freshwater	free-living	Europe

<i>R. annulata</i> (syn. <i>Opisthostyla</i>)	22-23	freshwater, attached to filamentous algae	epiphytic	Europe
<i>R. arenicolae</i>	45-60	marine, attached to worms (Polychaeta: arenicolid (<i>Arenicola piscatorum</i>))	epizoic	Europe
<i>R. arenaria</i>	50-65	marine, attached to sea cucumber (Echinodermata: synaptid (<i>Synapta inhaerens</i>))	epizoic	Europe
<i>R. bosminae</i>	38-44 x 18-20	freshwater, attached to water fleas (Branchiopoda: bosminid (<i>Bosmina</i>))	epizoic	Europe
<i>R. chironomi</i>	60	brackish water, attached to midge larvae (Diptera: chironomid (unspecified))	epizoic	Europe
<i>R. commensalis</i>	35-70 x 20-30	intertidal, attached to invertebrates (Polychaeta: capitellid (<i>Capitella capitata</i>), syllid (<i>Salvatoria</i>), trichobranchid (<i>Terebellides stromii</i>); Amphipoda: gammarid (<i>Gammarus</i>))	epizoic	China
<i>R. congregata</i>	38-40	freshwater, attached to rotifers (Rotifera: brachionid (<i>Brachionus</i>))	epizoic	Europe
<i>R. conipes</i>	40-46	fresh and brackish water, attached to invertebrates (Branchiopoda: daphniid (<i>Daphnia magna</i> , <i>longispina</i> , <i>Scapholeberis mucronata</i>))	epizoic	Europe
<i>R. cyclopis</i>	30	freshwater, attached to invertebrates (Copepoda: cyclopid (<i>Cyclops</i>); Ostracoda (unspecified))	epizoic	Europe
<i>R. cylindrica</i>	28	freshwater, attached to water fleas (Branchiopoda: leptorid (<i>Leptodora kindtii</i>))	epizoic	Eurasia
<i>R. dubia</i>	30-35	freshwater	free-living	Europe
<i>R. ephemerae</i>	75	freshwater, attached to mayfly larvae (Ephemeroptera: ephemerid (unspecified))	epizoic	Europe
<i>R. fromenteli</i> (syn. <i>Scyphidia</i>) [type species]	80	freshwater	free-living	Europe
<i>R. globularis</i> (syn. <i>Opisthostyla</i>)	25-34 x 17-20	freshwater, attached to algae and water fleas (Branchiopoda: bosminid (<i>Bosmina longirostris</i>), sidid (<i>Diaphanosoma brachyurum</i>))	epiphytic, epizoic	Europe
<i>R. hungarica</i>	35-40	freshwater, attached to water fleas (Branchiopoda: leptorid (<i>Leptodora kindtii</i>))	epizoic	Eurasia
<i>R. inclinans</i> (syn. <i>R. chaeticola</i> , <i>lumbriculi</i> , <i>Vorticella</i> , <i>Opercularia</i> , <i>Gerda</i>)	45-80 x 35-42	freshwater, attached to invertebrate animals (Annelida: lumbriculid (<i>Lumbriculus</i>), naidid (<i>Nais</i> , <i>Stylaria</i> , <i>Tubifex</i> , <i>Pristina</i>), esp. amongst filamentous bacteria (<i>Sphaerotilus</i>))	epizoic	Eurasia, America
<i>R. invaginata</i>	35	marine, attached to barnacles (Cirripedia: balanomorphid (<i>Cypris</i>))	epizoic	Europe
<i>R. libera</i>	60	marine, attached to algae	epiphytic	Europe
<i>R. limnophili</i>	55	freshwater, attached to 'kettle-fly' larvae (Diptera (unspecified))	epizoic	Europe
<i>R. longipes</i> (syn. <i>Opisthostyla</i>)	70	freshwater, attached to algae	epiphytic	Europe
<i>R. mapuche</i>	23-31 x 16-19	marine, attached to worms (Polychaeta: syllid (<i>Syllis</i> , <i>Salvatoria</i>))	epizoic	Europe
<i>R. muscorum</i>	40	freshwater, attached to mosses	epiphytic	Europe
<i>R. nebulifera</i> (syn. <i>Epistylis</i>)	125	freshwater, attached to watercress	free-living, epiphytic	Europe
<i>R. nereicola</i>	45 x 55-62	marine, attached to worms (Polychaeta: nereidid (<i>Nereis dumerili</i>))	epizoic	Europe
<i>R. patula</i>		freshwater	free-living	Eurasia

(syn. <i>Scyphidia</i>)				
<i>R. porculus</i>	135-155	freshwater, attached to detritus	free-living	Europe
<i>R. pristinis</i>	37 x 48	freshwater	free-living	Europe
<i>R. pusilla</i> (syn. <i>Opisthostyla</i>)	25	freshwater, attached to algae	epiphytic	Europe
<i>R. putrina</i> (syn. <i>Vorticella</i>)	60-90	freshwater and marine (polysaprobic)	free-living	Europe
<i>R. pyriformis</i> (syn. <i>Scyphidia</i> , <i>R. ovum</i>)	25-40	freshwater, attached to invertebrates (Branchiopoda: chydorid (<i>Alona rectangulara</i> , <i>Leydigia acanthocercoides</i>), daphniid (<i>Daphnia longispina</i> , <i>hyalina</i> , <i>pulex</i> , <i>magna</i> , <i>cucullata</i> , <i>atkinsoni</i> , <i>curvirostris</i> , <i>obtusa</i> , <i>Ceriodaphnia reticulata</i> , <i>laticaudata</i> , <i>pulchella</i> , <i>megalops</i> , <i>Scapholebris mucronata</i> , <i>Simocephalus vetulus</i>), leptodorida (<i>Leptodora kindtii</i>), moinid (<i>Moina micrura</i>); Copepoda (unspecified) and Rotifera (unspecified))	epizoic	Eurasia
<i>R. ringens</i> (syn. <i>Epistylis</i> , <i>Vorticella</i>)	80	freshwater, attached to oligochaetes (Clitellata: tubificid (<i>Nais</i>))	free-living, epizoic	Europe
<i>R. scyphidiformis</i>		freshwater, attached to amphibians (Anura: bombinatorid (European fire-bellied toad), bufonid (European green toad), hylid (European tree frog), pelobatid (European spadefoot toad), ranid (edible frog))	epizoic	Eurasia
<i>R. scyphoides</i>	35-44 x 24-27	marine, attached to prawns (Decapoda: penaeid (<i>Penaeus orientalis</i>))	epizoic	China
<i>R. sertularium</i> (syn. <i>Opisthostyla</i>)	40	marine, attached to invertebrates (Hydrozoa: aglaopheniid (<i>Aglaophenia pluma</i>); Ophiurida: amphiuroid (<i>Amphirua squamata</i> brittlestar))	epizoic	Eurasia
<i>R. sessilis</i>	43-45	freshwater, attached to invertebrates (Copepoda: cyclopid (<i>Cyclops</i>))	epizoic	Europe
<i>R. similis</i> (syn. <i>Opisthostyla</i>)	22	freshwater	free-living	Europe
<i>R. sphaeroides</i> (syn. <i>Epistylis</i>)	60	freshwater, attached to watercress	free-living, epiphytic	Europe
<i>R. thienemanni</i> (syn. <i>Opisthostyla</i>)		marine	free-living	North America
<i>R. tuboadui</i>	30-45 x 15-23	marine, attached to worms (Polychaeta: syllid (<i>Syllis prolifera</i>))	epizoic	Eurasia
<i>R. variabilis</i>	60-90	marine, attached to worms (Polychaeta: terebellid (unspecified))	epizoic	Eurasia
<i>R. vernalis</i>	50	marine, attached to invertebrates (Cirripedia: balanomorphid (<i>Cypris</i>); Copepoda: cyclopid (<i>Cyclops</i> , <i>Eucyclops agilis</i>))	epizoic	Europe
<i>R. volvocis</i>		freshwater, attached to colonial flagellates (Chlorophyceae: volvocaceae (<i>Volvox globator</i>))	epiphytic	Europe
Family Bezedniellidae (stalk, noncontractile, solitary or colonial, laterally displaced peristome, often into curved cylindrical trunk, epizoic on ostracods)				
Genus: Bezedniella (colonial, long branched stalk)				
<i>B. bambergensis</i>	50-68 x 38-48	freshwater, attached to invertebrates (Ostracoda: cypridid (<i>Cypria ophthalmica</i>))	epizoic (inner surface)	Europe
<i>B. prima</i> [type species]		freshwater, attached to invertebrates (Ostracoda: cypridid (<i>Cypria</i>))	epizoic	Europe
Genus Nuchterleinella (solitary, short stalk)				

<i>N. corneliae</i>	57-122 x 34-83	freshwater, attached to invertebrates (Ostracoda: cypridid (<i>Cypria ophthalmica</i>), cyclocyprinid (<i>Cyclocypris ovum</i>))	epizoic (furca, penis)	Europe
Family: Operculariidae (noncontractile stalks, well-developed thecae, unique epistomial discs with anterior opercula, usually epibiotic on aquatic insects and arthropods)				
Genus: Ballodora (globular flexible body with short lateral stalk, on terrestrial isopods)				
<i>B. dimorpha</i> (syn. <i>Opercularia</i>)		terrestrial, attached to wood lice (Isopoda: agnarid (<i>Protracheoniscus politus</i>), cylisticid (<i>Cylisticus convexus</i>), porcellionid (<i>Porcellio scaber</i> , <i>Porcelliens</i> , <i>Porcellium conspersum</i>), oniscid (<i>Oniscus asellus</i>), trachelipodid (<i>Tracheoniscus rathkei</i> , <i>Trachelipus ratzburgii</i>)	epizoic	Europe
<i>B. marceli</i> (syn. <i>Opercularia</i>)	50 x 40	terrestrial, attached to wood lice (Isopoda: trichoniscid (<i>Trichoniscus (Spiloniscus) provisorius</i> , <i>dentiger</i> , <i>Hyloniscus riparius</i> , <i>Titanethes</i>))	epizoic (appendages)	Europe
Genus: Opercularia (prominent stalk, branched, colonial, noncontractile without myoneme, horseshoe-shaped macronucleus, peristome without lip, rim often scalloped, peristomial ciliary wreath with < 2 turns)				
<i>O. archiorbopercularia</i>		freshwater	free-living	Europe
<i>O. arenicola</i>	80	freshwater; attached to fly larvae (Diptera (unspecified))	epizoic	Europe
<i>O. articulata</i> (syn. <i>O. phryganeae</i> , <i>confusa</i>) [type species]	80-260 x 30-70	freshwater, attached to inanimate substrates, detritus, filamentous algae, mosses, submerged plants, and invertebrate animals (Isopoda: asellid (<i>Asellus</i>); Amphipoda: gammarid (<i>Carinogrammus</i>); Coleoptera: dytiscid (<i>Dytiscus</i> water beetles))	free-living, epiphytic, epizoic	Europe
<i>O. assellicola</i>	120	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus</i>))	epizoic	Europe
<i>O. cema</i>	27-39 x 18-25	marine, attached to invertebrates (Amphipoda: talitrid (<i>Orchestia montagui</i> , <i>bottae</i>))	epizoic (appendages)	Black Sea
<i>O. clepsinis</i>	100-130	marine, attached to leeches (Hirudinea: glossiphoniid (<i>Clepsine bioculata</i> = <i>Helobdella stagnalis</i>))	epizoic	Europe
<i>O. coarctata</i> (syn. <i>Epistylis</i>)	40-65 x 25-30	freshwater (and activated sludge), attached to inanimate substrates, detritus, filamentous bacteria (<i>Sphaerotilus</i>), plants and invertebrates (Copepoda (unspecified); Bivalvia: sphaeriid (<i>Sphaerium</i>))	free-living, epiphytic, epizoic	cosmopolitan
<i>O. collegata</i>		freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Helochaeres</i>))	epizoic	Europe
<i>O. confervarum</i>		marine, attached to filamentous algae	epiphytic	Europe
<i>O. corethrae</i>	75-78	freshwater, attached to mosquito larvae (Diptera: culicid (<i>Corethra</i>))	epizoic	Europe
<i>O. coronata</i>		freshwater, attached to water boatman (Hemiptera: corixid (<i>Corixa punctata</i>))	epizoic	Europe
<i>O. crustaceorum</i>		freshwater, attached to crayfish (Decapoda: astacid (<i>Astacus astacus</i> , <i>Austropotamobius torrentium</i>))	epizoic	North America
<i>O. cupulata</i>		marine, attached to invertebrates (Isopoda: sphaeromatid (<i>Cymodoce truncata</i>))	epizoic	Europe
<i>O. cylindrata</i>	50	freshwater, attached to invertebrates (Copepoda: cyclopid (<i>Cyclops</i>))	epizoic	Europe
<i>O. dytiscidarum</i>		freshwater, attached to diving beetles (Coleoptera: dytiscid (unspecified))	epizoic	Europe

<i>O. elongata</i>	125-150	freshwater, attached to plants	epiphytic	Europe
<i>O. eumelita</i>		freshwater, attached to ciliates (Ciliophora: operculariid (<i>Orbopercularia catillicola</i>) attached to water scavenger beetles (Coleoptera: hydrophilid (<i>Enochrus coarctatus</i>))	epizoic	Europe
<i>O. faurei</i>	800	freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Hydrophilus aterrimus, piceus</i>))	epizoic	Europe
<i>O. franconia</i>		freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Hydrophilus aterrimus, piceus</i>))	epizoic	Europe
<i>O. gammari</i>		freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus</i>))	epizoic	Europe
<i>O. glomerata</i>	450	freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Hydrophilus piceus</i>))	epizoic	Europe
<i>O. gracilis</i>	80	freshwater, attached to snails (Gastropoda: lymnaeid (<i>Lymnea</i>))	epizoic	Europe
<i>O. halipli</i>		freshwater, attached to water beetle (Coleoptera: haliplid (<i>Halipilus flavicollis</i>))	epizoic	Europe
<i>O. hydrachnidarum</i>		freshwater, attached to mites (Acari: hydrachnid (<i>Hydrachna</i>))	epizoic	Europe
<i>O. hydroi</i>		freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Hydrophilus aterrimus, piceus</i>))	epizoic	Europe
<i>O. improbata</i>		freshwater, attached to ciliates (Ciliophora: operculariid (<i>Orbopercularia enochri, matthesi</i>) attached to water scavenger beetles (Coleoptera: hydrophilid (<i>Enochrus testaceus</i>))	epizoic	Europe
<i>O. irritabilis</i>		freshwater, attached to tortoises (Testudines (unspecified))	epizoic	North America
<i>O. lichtensteini</i>	130	marine, attached to crabs (Decapoda (unspecified) and molluscs (Bivalvia (unspecified))	epizoic	Europe
<i>O. ligiae</i>		marine, attached to sea slaters (Isopoda: ligiid (<i>Ligia italica</i>))	epizoic	Europe
<i>O. longigula</i>		marine	free-living	North America
<i>O. medians</i>	470	freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Hydrophilus, Hydrous aterrimus</i>))	epizoic	Europe
<i>O. microdiscum</i>	70-90	freshwater, attached to hoverfly larvae (Diptera: syrphid (unspecified))	epizoic	Europe
<i>O. minima</i>	40	freshwater, attached to mites (Acari (unspecified))	epizoic	Europe
<i>O. naucoris</i>		freshwater, attached to creeping water bug (Hemiptera: naucorid (<i>Naucoris cimicoides</i>))	epizoic	Europe
<i>O. nautonectae</i>		freshwater, attached to water boatman (Hemiptera: corixid (<i>Corixa geoffroyi</i>))	epizoic	Europe
<i>O. nutans</i> (syn. <i>O. allensi</i> , <i>microstoma</i> , <i>ramosa</i> , <i>Epistylis ramosa</i> , <i>Pyxidium ramosa</i>)	50-141 x 25-40	freshwater/marine, attached to inanimate substrates, detritus, filamentous algae (<i>Enteromorpha, Cladophora</i>), submerged plants (<i>Ceratophyllum, Hottonia, Lemna, Myriophyllum</i>) and invertebrate animals (Diptera: chironomid (midge larvae), Ephemeroptera: ephemerid (<i>Caenis</i> mayfly larvae); Branchiopoda: chydorid (<i>Alona affinis</i>); Megaoptera: sialid (<i>Sialis</i> alderfly larvae); Amphipoda: gammarid (scuds); Decapoda: astacid (<i>Astacus</i>	free-living, epiphytic, epizoic	cosmopolitan

		<i>leptodactylus</i>)		
<i>O. parallela</i>	70	freshwater	free-living	Europe
<i>O. penardi</i>	90-110	freshwater, attached to plants (<i>Lemna polyrrhiza</i>)	epiphytic	Europe
<i>O. phryganeae</i>	120	freshwater, attached to caddisfly larvae (Trichoptera (unspecified))	epizoic	Europe
<i>O. plicatilis</i>	250	freshwater, attached to plants	epiphytic	Europe
<i>O. prossi</i>		freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Hydrophilus aterrimus, piceus</i>))	epizoic	Europe
<i>O. protecta</i>	80-112 x 35-40	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus pulex</i>))	epizoic (appendages)	Europe
<i>O. reichelei</i>		freshwater, attached to crayfish (Decapoda: astacid (<i>Astacus leptodactylus</i>))	epizoic (appendages)	Europe
<i>O. reichenowi</i>		freshwater, attached to water boatman (Hemiptera: corixid (<i>Sigara striata</i>))	epizoic	Europe
<i>O. rugosa</i>	150-200	freshwater, attached to plants	epiphytic	Europe
<i>O. sommerae</i>	38-52 x 18-22	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus</i>))	epizoic (body)	Europe
<i>O. stammeri</i>		terrestrial, attached to wood lice (Isopoda: oniscid (<i>Oniscus asellus</i>))	epizoic	Europe
<i>O. stenostoma</i>	110	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>))	epizoic	Europe
<i>O. venusta</i>		freshwater	free-living	Europe
Genus: Operculariella (colonial, barrel-shaped body on short rigid stalk, branched, endozoic in oesophagus of beetle)				
<i>O. parasitica</i> [type species]	100-110	terrestrial, located in diving beetle (Coleoptera: dytiscid (unspecified)); [also possibly in stag beetle Coleoptera: lucanid (<i>Aegus currani</i>)]	endozoic (oesophagus) [hindgut]	Europe [Philippines]
Genus: Orbopercularia (prominent stalk, branched, colonial, noncontractile without myoneme, discoidal-spherical macronucleus, peristome without lip, < 2 adoral spirals, striated silverline system)				
<i>O. acilii</i> (syn. <i>Opercularia</i>)	51 x 27	freshwater, attached to water beetles (Coleoptera: dytiscid (unspecified))	epizoic	Europe
<i>O. agabi</i>		freshwater, attached to water beetles (Coleoptera: dytiscid (unspecified))	epizoic	Europe
<i>O. assimilis</i> (syn. <i>Syncyathella</i>)	50-60 x 30-35	freshwater, attached to water scavenger beetle (Coleoptera: dytiscid (<i>Hydaticus</i>), hydrophilid (<i>Helochaeres</i>))	epizoic (appendages)	Asia
<i>O. astacicola</i> (syn. <i>Opercularia</i>)		freshwater, attached to crayfish (Decapoda: astacid (<i>Austropotamobius torrentium</i>))	epizoic (appendages)	North America
<i>O. berberina</i> [type species as <i>Vorticella</i>]	62-130 x 28-33	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus roeselii</i>) and water bugs (Hemiptera: naucorid (<i>Naucoris cimicoides</i>))	epizoic	Europe
<i>O. calix</i>		freshwater, attached to water scavenger beetles (Coleoptera: hydrophilid (<i>Enochrus testaceus</i>))	epizoic	Europe
<i>O. carlae</i>		freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Laccobius</i>))	epizoic	Europe
<i>O. catillicola</i> (syn. <i>Syncyathella</i>)		freshwater, attached to water scavenger beetles (Coleoptera: hydrophilid (<i>Enochrus coarctatus</i>))	epizoic	Europe
<i>O. corlissi</i>	72-80 x 24	freshwater, attached to moss beetles (Coleoptera: hydraenid (<i>Hydraena</i>))	epizoic (legs)	Europe
<i>O. cylindrica</i>	48-68 x 20-24	freshwater, attached to backswimmer bug (Hemiptera: pleid (<i>Plea</i>))	epizoic (appendages)	China
<i>O. discostyla</i>		freshwater, attached to water beetles (Coleoptera: dytiscid (unspecified))	epizoic	Europe

<i>O. dominiki</i>	38-54 x 20-38	freshwater, attached to invertebrates (Ostracoda: cypridid (<i>Cypria ophthalmica</i>), cyclocyprinid (<i>Cyclocypris ovum</i>))	epizoic (legs, antennae)	Europe
<i>O. dreyeri</i>		freshwater, attached to water scavenger beetles (Coleoptera: hydrophilid (<i>Enochrus testaceus</i>))	epizoic	Europe
<i>O. enochri</i>		freshwater, attached to water scavenger beetles (Coleoptera: hydrophilid (<i>Enochrus testaceus</i>))	epizoic (legs)	Europe
<i>O. erlangensis</i> (syn. <i>Serioscyphus</i>)		freshwater	free-living	Europe
<i>O. exigata</i>		freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Laccobius</i>))	epizoic	Europe
<i>O. femoralis</i>		freshwater, attached to water scavenger beetles (Coleoptera: hydrophilid (<i>Enochrus testaceus</i>))	epizoic	Europe
<i>O. finki</i>		freshwater, attached to water scavenger beetles (Coleoptera: hydrophilid (<i>Enochrus testaceus</i>))	epizoic	Europe
<i>O. finleyi</i>	60-66 x 36	freshwater, attached to water beetles (Coleoptera: hydrophilid (<i>Berosus luridus</i>))	epizoic	Europe
<i>O. fusiformis</i> (syn. <i>Syncyathella</i>)	100-110 x 32-36	freshwater, attached to water beetle (Coleoptera: dytiscid (<i>Hydaticus</i>))	epizoic (appendages)	China
<i>O. gnathophila</i>		freshwater, attached to whirligig beetles (Coleoptera: gyridid (unspecified))	epizoic (preoral cavity)	Europe
<i>O. haliplorum</i>		freshwater, attached to water beetles (Coleoptera: dytiscid (unspecified))	epizoic	Europe
<i>O. hasenfussi</i>		freshwater	free-living	Europe
<i>O. hebetata</i>		freshwater, attached to water beetles (Coleoptera: dytiscid (unspecified))	epizoic	Europe
<i>O. helocharidis</i>		freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Helochares</i>))	epizoic	Europe
<i>O. hydropori</i>		freshwater, attached to water beetles (Coleoptera: dytiscid (unspecified))	epizoic	Europe
<i>O. hyphidri</i>		freshwater, attached to diving beetles (Coleoptera: dytiscid (<i>Hyphydrus ferrugineus</i>))	epizoic	Europe
<i>O. illustris</i>		freshwater, attached to diving beetles (Coleoptera: dytiscid (<i>Hydroporus tristis</i>))	epizoic	Europe
<i>O. ilybii</i>		freshwater, attached to water beetles (Coleoptera: dytiscid (unspecified))	epizoic	Europe
<i>O. inclinata</i>		freshwater, attached to water beetles (Coleoptera: dytiscid (unspecified))	epizoic	Europe
<i>O. krauteri</i>		freshwater	free-living	Europe
<i>O. laccobii</i> (syn. <i>Opercularia</i>)		freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Laccobius</i>))	epizoic	Europe
<i>O. lichtensteini</i>	56-84 x 30-40	freshwater, attached to water boatman (Hemiptera: corixid (<i>Corisella edulis</i>) and beetles (Coleoptera: noterid (<i>Noterus clavicornis</i> , <i>crassicornis</i>), dytiscid (<i>Agabus congener</i> , <i>didymus</i> , <i>sturnii</i> , <i>Colymbetes fuscus</i> , <i>Hydroporus ferrugineus</i> , <i>Ilybus aenescens</i> , <i>angustior</i> , <i>ater</i> , <i>fenestratus</i> , <i>fuliginosus</i> , <i>subaenus</i> , <i>Laccophilus virescens</i> , <i>Rhantus exoletus</i> , <i>punctatus</i> , <i>suturellus</i>))	epizoic (appendages, body, eyes)	Eurasia, North America

<i>O. liebmanni</i>		freshwater, attached to water beetles (Coleoptera: dytiscid (unspecified))	epizoic	Europe
<i>O. loricata</i>		freshwater	free-living	Europe
<i>O. lusti</i> (syn. <i>Syncyathella</i>)		freshwater, attached to moss beetles (Coleoptera: hydraenid (<i>Hydraena britteni</i>))	epizoic	Europe
<i>O. macronucleata</i>		freshwater	free-living	Europe
<i>O. matthesi</i>		freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Enochrus coarctatus</i>))	epizoic	Europe
<i>O. micronectae</i>	45-50 x 20	freshwater, attached to water bugs (Hemiptera: micronectid (<i>Micronecta</i>))	epizoic (legs)	Eurasia
<i>O. neningerae</i>		freshwater, attached to water scavenger beetles (Coleoptera: hydrophilid (<i>Enochrus testaceus</i> , <i>Helochares lividus</i>))	epizoic	Europe
<i>O. nodosa</i>		freshwater	free-living	Europe
<i>O. oligochaetae</i>		freshwater, attached to inert substrates and worms (<i>Oligochaeta</i> (unspecified))	free-living, epizoic	Russia
<i>O. ominosa</i>		freshwater, attached to whirligig beetles (Coleoptera: gyridid (unspecified))	epizoic (preoral cavity)	Europe
<i>O. oschei</i>		freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Helochares</i>))	epizoic	Europe
<i>O. ovalis</i> (syn. <i>Syncyathella</i>)	69-82 x 35-41	freshwater, attached to water beetle (Coleoptera: dytiscid (<i>Hydaticus</i>))	epizoic (appendages)	China
<i>O. philydri</i>		freshwater, attached to water scavenger beetles (Coleoptera: dytiscid (unspecified), hydrophilid (<i>Enochrus ochropterus</i>))	epizoic	Europe
<i>O. plachteri</i>		freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Helochares lividus</i>))	epizoic (antennae)	Europe
<i>O. pleae</i>		freshwater, attached to backswimmer bug (Hemiptera: pleid (<i>Plea leachi</i> , <i>minutissima</i>))	epizoic	Europe
<i>O. pulchra</i>	70 x 25-28	freshwater, attached to backswimmer bugs (Hemiptera: notonectid (<i>Notonecta marmorea</i>))	epizoic (legs)	Eurasia
<i>O. quasiinvoluta</i>		freshwater, attached to diving beetle (Coleoptera: dytiscid (<i>Dystiscus marginalis</i>))	epizoic	Europe
<i>O. quinquaginta</i>		freshwater, attached to water scavenger beetles (Coleoptera: hydrophilid (<i>Enochrus testaceus</i>))	epizoic	Europe
<i>O. rara</i>		freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Enochrus testaceus</i> , <i>melanocephalus</i>))	epizoic	Europe
<i>O. rhanti</i>		freshwater, attached to water beetles (Coleoptera: dytiscid (unspecified))	epizoic	Europe
<i>O. robusta</i>		freshwater, attached to water scavenger beetles (Coleoptera: hydrophilid (<i>Laccobius</i> , <i>Enochrus testaceus</i>))	epizoic	Europe
<i>O. scheloskei</i>		freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Laccobius</i>))	epizoic	Europe
<i>O. scheubeli</i>		freshwater, attached to water scavenger beetles (Coleoptera: hydrophilid (<i>Enochrus testaceus</i>))	epizoic	Europe
<i>O. schremmeri</i>		freshwater	free-living	Europe
<i>O. scyphostyla</i>	80	freshwater, attached to beetle (Coleoptera: noterid (<i>Noterus clavicornis</i>))	free-living, epizoic (legs)	Europe
<i>O. serrata</i>		freshwater, attached to water beetles	epizoic	Europe

		(Coleoptera: dytiscid (unspecified))		
<i>O. siewingi</i>		freshwater, attached to water scavenger beetles (Coleoptera: hydrophilid (<i>Enochrus testaceus</i>))	epizoic	Europe
<i>O. sitiens</i>	63-71 x 25-27	freshwater, attached to water beetles (Coleoptera: dytiscid (unspecified))	epizoic	Europe
<i>O. steffani</i>		freshwater, attached to water scavenger beetles (Coleoptera: hydrophilid (<i>Enochrus coarctatus</i>))	epizoic	Europe
<i>O. tobsinella</i>		freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Laccobius</i>))	epizoic	Europe
<i>O. turgida</i>		freshwater, attached to water boatman (Hemiptera: corixid (<i>Sigara falleni</i>) and water beetle (Coleoptera: dytiscid (<i>Agabus</i>))	epizoic (rostrum bristle)	Europe
<i>O. triangulata</i>	53 x 30	freshwater, attached to diving beetle (Coleoptera: dytiscid (<i>Rhantus punctatus</i>))	epizoic	Europe
<i>O. valvata</i>		freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Laccobius</i>))	epizoic	Europe
<i>O. wetzeli</i>		freshwater, attached to water beetle (Coleoptera: dytiscid (<i>Acilius sulcatus</i>))	epizoic	Europe
<i>O. xinjiangensis</i>	48-52 x 15-18	freshwater, attached to water beetle (Coleoptera: dytiscid (<i>Hydaticus</i>))	epizoic (antennae, appendages)	China
genus: <i>Orbopyxidiella</i> (solitary, short stalk with small basal plate, fastened obliquely to substrate, no peristomial lip, striated silverline system)				
<i>O. helophori</i> (syn. <i>Propyxidium</i> , <i>Pyxidiella</i>)	88-100	freshwater, attached to water scavenger beetles (Coleoptera: helophorid (<i>Helophorus</i>), hydrophilid (unspecified))	epizoic	Eurasia
<i>O. matthesi</i>	21-30	freshwater, attached to worms (Oligochaeta (unspecified))	epizoic	Europe
<i>O. minuta</i>		freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (unspecified))	epizoic	Europe
<i>O. stammeri</i> (syn. <i>Ampullaster</i>) [type species]		freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (unspecified))	epizoic	Europe
<i>O. susanna</i>	33-45 x 15-25	freshwater, attached to invertebrates (Ostracoda: cypridid (<i>Cypria ophthalmica</i>), cyclocypridid (<i>Cyclocypris ovum</i>))	epizoic (carapace)	Europe
<i>O. tretzeli</i> (syn. <i>Opercularia</i>)	43-67	freshwater, attached to invertebrates (Ostracoda (unspecified))	epizoic	Europe
Genus: <i>Propyxidium</i> (solitary, short stalk, noncontractile without myoneme, peristome without lip)				
<i>P. acaule</i> (syn. <i>Pyxidiella</i> , <i>Pyxidium</i>)	100	freshwater, attached to mosquito larvae (Diptera: culicid (<i>Corethra</i>))	epizoic	Europe
<i>P. aselli</i> (syn. <i>Pyxidium</i>)	80-125	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus</i>))	epizoic	Europe
<i>P. asymmetricum</i> (syn. <i>Pyxidium</i>)		freshwater, attached to crayfish (Decapoda: astacid (<i>Astacus astacus</i>))	epizoic	Europe
<i>P. bosminae</i> (syn. <i>Pyxidium</i>)	40-50	freshwater, attached to water fleas (Branchiopoda: bosminid (<i>Bosmina</i>))	epizoic	Europe
<i>P. canthocampti</i> (syn. <i>Pyxidium</i>)	25-32	freshwater, attached to invertebrates (Copepoda: canthocamptid (<i>Canthocamptus</i>))	epizoic	Europe
<i>P. collare</i> (syn. <i>Pyxidium</i>)	90	freshwater, attached to plants (<i>Lemna</i>) and water mites (Trombidiformes (unspecified))	epiphytic, epizoic	Europe

<i>P. cothurnoides</i> (syn. <i>Pachytrocha</i>) [type species]	50	freshwater, attached to plants and invertebrates (Ostracoda: cypridid (<i>Cypris</i>))	epiphytic, epizoic	Europe
<i>P. curvicaule</i> (syn. <i>Pyxidium</i>)	40-80	freshwater/terrestrial, attached to moss	epiphytic	Europe
<i>P. fabrei</i> (syn. <i>Pyxidium</i> , <i>Opercularia</i>)	120	freshwater, attached to hoverfly larvae (Diptera: syrphid (<i>Eristalis</i>))	epizoic	Europe
<i>P. grelli</i> (syn. <i>Pyxidiella</i> , <i>Orbopyxidiella</i>)		freshwater, attached to beetle (Coleoptera: dytiscid (<i>Platambus maculeatus</i>))	epizoic	Europe
<i>P. hebes</i> (syn. <i>Pyxidium</i> , <i>Opercularia</i>)	73-150 x 39-59	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>))	epizoic (body, appendages)	Europe
<i>P. henneguyi</i> (syn. <i>Opercularia</i> , <i>Orbopercularia</i>)	50-85	freshwater, attached to invertebrates (Copepoda: cyclopid (<i>Cyclops</i>))	epizoic	Europe
<i>P. inclinans</i> (syn. <i>Pyxidium</i> , <i>Opercularia</i>)	80	freshwater, attached to algae and oligochaetes (Clitellata: tubificid (<i>Nais</i>))	epiphytic, epizoic	Europe
<i>P. invaginatium</i> (syn. <i>Pyxidium</i>)	80	freshwater, attached to moss and plants (<i>Lemna</i>)	epiphytic	Europe
<i>P. kahli</i> (syn. <i>Pyxidium</i> , <i>Orbopyxidiella</i>)		freshwater	free-living	Europe
<i>P. longicollum</i> (syn. <i>Pyxidium</i>)	Biegel 1954	terrestrial (soil), attached to inert substrates and the shells of testate amoebae	free-living, epizoic?	Europe
<i>P. nutans</i> (syn. <i>Pyxidium</i>)	60	freshwater, attached to plants	epiphytic	Europe
<i>P. piscicolae</i> (syn. <i>Pyxidiella</i> , <i>Pyxidium</i>)		freshwater, attached to leeches (Hirudinea: piscicolid (<i>Piscicola geometra</i>))	epizoic	Europe
<i>P. singulare</i>		freshwater, attached to water beetles (Coleoptera (unspecified))	epizoic	Europe
<i>P. sinuosa</i> (syn. <i>Pyxidiella</i>)		freshwater, attached to water scavenger beetle (Coleoptera: hydrophilid (<i>Helochaeres</i>))	epizoic	Europe
<i>P. tardigradum</i> (syn. <i>Pyxidium</i>)	35-78	limno-terrestrial (freshwater, soil, moss, lichen (e.g. <i>Xanthoria parietina</i>)), attached to water bears (Tardigrada: milnesiid (<i>Milnesium</i> cf. <i>tardigradum</i> , <i>variefidum</i>), hypsibiid (<i>Hypsibius</i> cf. <i>scabropygus</i> , <i>Isohypsibius undulatus</i>), macrobiotid (<i>Macrobotus</i> cf. <i>hufelandi</i> , <i>scoticus</i> , <i>Minibiotus</i> cf. <i>intermedius</i>), ramazzottiid (<i>Ramazzottius</i> cf. <i>oberhausei</i>))	epizoic (body)	Europe
<i>P. tectiformis</i>	52 x 19	freshwater, attached to fish (Cypriniformes: leuciscid (common minnow))	epizoic (gills)	Africa
<i>P. urceolatum</i> (syn. <i>Pyxidium</i>)	90	freshwater, attached to plants (<i>Lemna</i>)	epiphytic	Europe
<i>P. ventriosa</i> (syn. <i>Pyxidiella</i> , <i>Pyxidium</i>)		freshwater, attached to mosquito larvae (Diptera: cuculid (<i>Corethra</i>))	epizoic	Europe
<i>P. vernale</i> (syn. <i>Pyxidium</i>)	70	freshwater, attached to algae	epiphytic	Europe
genus: <i>Triadopercularia</i> (fossil taxon, cup-like pseudochitinous lorica fossilized, triangular stems with short basal stalk for attachment to fossilized ostracod host)				
<i>T. spitzbergensis</i> [type species]	167-200 x 88-117	fossilized ostracods		Europe

Family: Rovinjellidae				
Genus: <i>Rovinjella</i> (1-4 zooids in shared cup-like lorica with wide aperture and short basal stalk, zooids attached internally by short stalk (branched in colonies) with central continuous myoneme)				
<i>R. spheromae</i> [type species]	100 x 98	marine (beach), associated with Isopoda: sphaeromatid (<i>Sphaeroma serratum</i>)	epizoic	Europe
Family: Usconophryidae (lorica, lack of closure apparatus operated by peristomial sphincter, operculariform peristome (without lip))				
Genus: <i>Cyclodonta</i> (upright lorica, vase-shaped with broad aperture, with short stalk, often bent, open aperture, zooid attached to base of lorica by a series of membranes)				
<i>C. bipartita</i> (syn. <i>Lagenophrys</i> , <i>Cothurnia affinis</i> , <i>bipartita</i> , <i>longipes</i> , <i>rheotypica</i> , <i>trilobata</i> , <i>voigti</i>) [type species as <i>Cothurnia</i>]	50-165 x 40-70	freshwater or marine, attached to seaweeds and invertebrates (Bryozoa (unspecified); Copepoda: harpacticoid (unspecified), canthocamptid (<i>Canthocamptus minutus</i> , <i>staphylinus</i> , <i>veidovskyi</i>); Branchiopoda: daphniid (<i>Daphnia</i>); Decapoda: astacid (<i>Astacus leptodactylus</i>), cambarid (<i>Cambarus affinis</i> , <i>Orconectes limosus</i>))	epiphytic, epizoic (carapace)	Eurasia, North America
Genus: <i>Usconophrys</i> (lorica hemispheroidal, distorted laterally and flattened, open aperture at anterior dorsal surface surrounded by projecting rim)				
<i>U. aperta</i> [type species as <i>Lagenophrys</i>] (syn. <i>U. dauricus</i>)	49-85 x 44-74 x 14-24	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i> , <i>hilgendorfi</i> , <i>Caecidotea</i>))	epizoic (gills)	Europe, North America
<i>U. rotunda</i> (syn. <i>Lagenophrys</i>)		freshwater, attached to invertebrates (Ostracoda (unspecified))	epizoic	Europe
Family: Vorticellidae				
Genus: <i>Apocarchesium</i> (stalked, unbranched, colonial whereby zooids cluster in rosette at expanded tip of primary stalk, sinusoidal myoneme contracts in helical fashion, vegetative zooids and macrozooids not connected to myoneme of colony stalk, occasional microzooids connected to microneme, transverse silverline system)				
<i>A. arndti</i>	150-210 x 25-35	freshwater	free-living	Europe
<i>A. rosettum</i>	80-100 x 30-40	freshwater	free-living	Asia
Genus: <i>Baikalonis</i> (solitary, short stalk, unbranched, straight continuous spasmoneme, stalk contracts by shortening longitudinally and becomes partly enveloped by zooid)				
<i>B. foissneri</i> [type species]	50-60 x 20	freshwater, attached to caddisfly larvae (Trichoptera: apataniid (<i>Baicalina bellicosa</i>))	epizoic	Russia
<i>B. gammari</i> (syn. <i>Halpocaulus</i>)	75 x 45	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus pulex</i>))	epizoic	Europe
<i>B. microdiscus</i>	20-30 x 15-20	intertidal, attached to invertebrates (Copepoda: harpacticoid (unspecified species))	epizoic	China
<i>B. undulata</i> (syn. <i>Vorticella</i> , <i>Vorticellopsis</i>)	110 x 72	marine, attached to algae (<i>Desmaresita viridis</i>)	epiphytic	Eurasia
Genus: <i>Baikalaster</i> (solitary, Zooids with lateral pseudopodial extensions, stalk, unbranched, central myoneme contracts in spiral fashion)				
<i>B. pelagicus</i> [type species]	46-57 x 78-109	freshwater, attached to filamentous cyanobacteria (<i>Anabaena</i>) and desmidiacid algae (<i>Micrasterias</i>)	epiphytic	Eurasia
Genus <i>Carchesium</i> (prominent stalk, either unbranched bearing single zooids or branched bearing small colonies, with discontinuous sinusoidal myonemes, contracts in spiral fashion)				
<i>C. amphibiarum</i>		freshwater, attached to amphibians (Anura (unspecified tadpoles))	epizoic	Europe
<i>C. batorligetiense</i>		freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus roeselii</i> , <i>Rivulogammarus triacanthus</i>))	epizoic	Europe
<i>C. bipartitum</i>	18	freshwater	free-living	Europe
<i>C. brevistylum</i>		freshwater, attached to invertebrates (Branchiopoda: leptodoriid (<i>Leptodora kindtii</i>))	epizoic	Europe

<i>C. cyclopidarum</i>	50 x 30-35	freshwater, attached to invertebrates (Copepoda: cyclopid (<i>Cyclops viridis</i>))	epizoic	Europe
<i>C. dipneumon</i>	43-81 x 35-58	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Dikerogammarus vilosus</i> , <i>Gammarus fossarum</i> , <i>pulex</i> , <i>roeselii</i>))	epizoic	Europe
<i>C. duplex</i>	13	freshwater	free-living	Europe
<i>C. duplicatum</i>		marine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus locusta</i> , <i>oceanicus</i> , <i>pulex</i>))	epizoic	Europe
<i>C. epistylidis</i>		freshwater, attached to algae and invertebrates (Copepoda: cyclopid (<i>Cyclops viridis</i>))	epizoic	Europe, North America
<i>C. epistylis</i> (syn. <i>C. septatum</i>)	50	freshwater, free-swimming and attached to caddisfly larvae (Trichoptera: phryganid (unspecified))	free-living, epizoic	Europe
<i>C. gammari</i>		freshwater and marine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus locusta</i> , <i>insensibilis</i>))	epizoic (appendages)	Europe
<i>C. gemellum</i>		marine	free-living	Europe
<i>C. gracilis</i>		freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus fossarum</i>))	epizoic	Europe
<i>C. granulatum</i>	100	freshwater, attached to plants (' <i>Buffalo</i> ') and crayfish (Decapoda: cambarid (<i>Cambarus</i>))	epizoic	North America
<i>C. jaerae</i>		marine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus tigrinus</i>); Isopoda: janarid (<i>Jaera albifrons</i> , <i>marina</i>))	epizoic	Europe
<i>C. limbatum</i>		freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>))	epizoic	Europe
<i>C. longipes</i>		freshwater, attached to plants (watercress)	epiphytic	Europe
<i>C. margaritatum</i>		freshwater, attached to plants (watercress)	epiphytic	Europe
<i>C. marginatum</i>		freshwater	free-living	Europe
<i>C. palnigeniae</i>	20-39	freshwater, attached to fairy shrimp (Branchiopoda: branchipodid (<i>Branchipus</i>))	epizoic	Europe
<i>C. prehti</i>		marine	free-living	Eurasia
<i>C. racemosa</i> (syn. <i>Vorticella</i>)		marine	free-living	Europe
<i>C. ramosissima</i> (syn. <i>Vorticella</i>)		marine	free-living	Europe
<i>C. spectabile</i> (syn. <i>C. lachmanni</i>)		freshwater (stagnant)	free-living	Europe
<i>C. steueri</i>		freshwater	free-living	Europe
<i>C. trichopterarum</i>		freshwater	free-living	Europe
<i>C. valentinae</i>		freshwater	free-living	Eurasia
<i>C. voighti</i>		marine, attached to invertebrates (Isopoda: ligiid (<i>Ligia oceanica</i>))	epizoic	Europe
<i>C. wassenum</i>	229-280 x 55-71	freshwater, attached to prawns (Decapoda: atyid (<i>Caridina nilotica</i>))	epizoic	Africa
Genus: Cotensita (solitary, stalk with folded sheath below zooid, unbranched, straight discontinuous spasmoneme, upon contraction zooid bends to one side)				
<i>C. commensalis</i> [type species]	46 x 36	freshwater, attached to caddisfly larvae (Trichoptera: apataniid (<i>Baicalina bellicosa</i>))	epizoic	Russia
Genus Entziella (prominent stalk, branched supporting colonies, continuous straight myoneme permeating entire colony, contracts in zig-zag fashion, peristome without lip)				
<i>E. aselli</i>		freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>))	epizoic (carapace)	Europe
<i>E. asellicola</i>		freshwater, attached to invertebrates	epizoic	Europe

[type species] (syn. <i>Zoothamnium mirus</i>)		(Isopoda: asellid (<i>Asellus aquaticus</i>))	(carapace)	
<i>E. orchestis</i>	32-45 x 17-31	freshwater, attached to invertebrates (Amphipoda: talitrid (<i>Orchestia bottae</i> , <i>montagui</i>))	epizoic	Black Sea
Genus: <i>Epicarchesium</i> (stalk, branched, colonial, interrupted myoneme, contractile, reticulate silverline system)				
<i>E. abrae</i> (syn. <i>Carchesium</i>)	45-85 x 35-55	marine	free-living	China
<i>E. corlissi</i>	60-70 x 25-35	marine	free-living	China
<i>E. granulatum</i> (syn. <i>Carchesium</i>) [type species]	65-105 x 30-60	freshwater, attached to crayfish (Decapoda: cambarid (<i>Cambarus</i>))	epizoic	America
<i>E. pectinatum</i> (syn. <i>Carchesium</i> , <i>Zoothamnium</i> , <i>Z. limneticum</i>)	40-70 x 60	freshwater (potamoplankton)	free-living	Eurasia, Americas
<i>E. sinense</i>	45-60 x 30-40	freshwater	free-living	China
<i>E. variable</i> (syn. <i>Carchesium</i>)	100-120 x 50-65	marine	free-living	China
Genus: <i>Grainis</i> (flexible thick-walled shell (lorica) housing 1-2 vasiform zooids, attached by short thick stalks (basostyles) with short discontinuous myonemes, contraction independent)				
<i>G. dizoon</i> [type species]	60-73x21-28	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Poekilogammarus</i>))	epizoic (pleopods)	Russia
Genus <i>Intranstylum</i> (prominent stalks, branched, colonial, discontinuous straight myonemes short and not progressing beyond forks in stalk, contracts in zig-zag fashion)				
<i>I. antarcticum</i>	100 x 60	marine	free-living	Antarctica
<i>I. barendrechtii</i>		estuarine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus tigrinus</i>))	epizoic	Europe
<i>I. brachymyon</i>		marine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus locusta</i>))	epizoic	Europe
<i>I. coniferum</i>		marine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus locusta</i>))	epizoic	Europe
<i>I. contrahens</i> (basonym <i>Epistylis steini</i> var. <i>contrahens</i>) [type species]		freshwater	free-living	Europe
<i>I. duplicatum</i>		estuarine, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Gammarus duebeni</i> , <i>locusta</i>))	epizoic	Europe
<i>I. eismondi</i>		freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus pulex</i>))	epizoic	Europe
<i>I. intermedium</i>	80-92 x 42-56	marine, attached to invertebrates (Decapoda: penaeid (<i>Penaeus orientalis</i>))	epizoic	China
<i>I. invaginatum</i> (syn. <i>Rhabdostyla</i>)		freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus pulex</i>); Branchiopoda: bosmid (<i>Bosmina</i>), chydorid (<i>Chydorus sphaericus</i>), daphniid (<i>Daphnia atkinsoni</i> , <i>longispina</i> , <i>magna</i> , <i>obtusa</i> , <i>pulex</i> , <i>Scapholeberis mucronata</i>); Copepoda: cyclopid (<i>Cyclops viridis</i>); Ostracoda: candonid (<i>Candona</i>), cypridid (unspecified))	epizoic	Europe
<i>I. longum</i>		marine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus locusta</i>))	epizoic	Europe

<i>I. macrostylum</i> (syn. <i>Zoothamnium</i>)		freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>))	epizoic	Europe
<i>I. ovulum</i>	44-60 x 24-32	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Gammarus</i>))	epizoic	Eurasia
<i>I. palaemoni</i>		freshwater, attached to invertebrates (Decapoda: palaeminid (<i>Macrobrachium nipponense</i>))	epizoic	Asia
<i>I. rhabdostyla</i> (syn. <i>Epistylis</i>)	27-43 x 15-25	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus pulex</i>))	epizoic	Europe
<i>I. simulans</i> (syn. <i>Epistylis</i>)		freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>))	epizoic	Europe
<i>I. steinii</i> (syn. <i>Epistylis</i>)	40-55	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Gammarus fossarum</i> , <i>pulex</i> , <i>triacanthus</i> , <i>Carinogrammus roeselii</i> , <i>Chaetogrammus</i> , <i>Dikerogrammus</i>), niphargid (<i>Niphargus costozae</i>))	epizoic	Europe
<i>I. triforum</i>	48-62 x 30-36	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus pulex</i> , <i>roeselii</i>))	epizoic	Europe
<i>I. variabilis</i>		marine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus tigrinus</i>))	epizoic	Europe
Genus Parazoothamnium (solitary, prominent stalk, unbranched, straight continuous spasmoneme, contracts in 2 stage process, shortens in concertina-like fashion, then bends and loops, transverse silverline system)				
<i>P. claparedei</i> (syn. <i>Vorticella</i>)	85 x 60	marine, attached to filamentous algae	epiphytic	Russia
<i>P. stenotica</i> [type species]	70 x 50	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus fossarum</i> , <i>pulex</i>))	epizoic	Europe
Genus: Pelagovorticella (solitary, stalk, nonbranched, contractile, usually found as pelagic/planktonic zooids)				
<i>P. mayeri</i> [type species] (syn. <i>Vorticella</i>)	30-55 x 25-45	estuarine (euplanktonic)	free-living	Eurasia, America
<i>P. natans</i> (syn. <i>Vorticella</i> , <i>V. convallaria</i> var. <i>natans</i>)	70-100 x 50-70	estuarine, euplanktonic, and attached to invertebrates (Decapoda: cambarid (<i>Cambarellus patzcuarensis</i>))	free-living, epizoic	Eurasia, America
Genus Piesika (solitary, stalk, unbranched, straight continuous spasmoneme, contracts in 2 stage process, shortens longitudinally in concertina-like fashion, then loops and folds, reticulate silverline system)				
<i>P. gammari</i> [type species as <i>Parazoothamnium</i>]	70 x 50	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus pulex</i>))	epizoic	Europe
Genus: Planeticovorticella (unique life-stages comprising free trophonts swimming with peristomial cilia and sessile trophonts attaching to each other in small clusters (doublets, tetrads) with short noncontractile stalks or occasionally as individuals to substrates with scopula or short stalks)				
<i>P. finleyi</i> [type species]	38-59 x 21-30	estuarine (planktonic)	free-living	North America
<i>P. paradoxa</i> (syn. <i>Carchesium</i> , <i>Epistylis</i>)	48-85 x 32-45	marine, free-swimming and attached to clams (Bivalvia: venerid (<i>Meretrix meretrix</i>))	free-living, epizoic (gills)	China
Genus Pseudocarchesium (prominent stalks, branched, colonial, discontinuous straight myonemes variable in length, some progressing beyond forks in stalk, contracts in zig-zag fashion)				
<i>P. amstelodamensis</i>		estuarine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus tigrinus</i>))	epizoic	Europe
<i>P. aselli</i> (syn. <i>Carchesium</i>)	50-100	freshwater/marine, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Gammarus fossarum</i> , <i>pulex</i>); Decapoda:	epizoic	Eurasia, America

		penaeid (<i>Penaeus chinensis/orientalis</i>)		
<i>P. asellicola</i> (syn. <i>Intranstylum</i>)	35-55	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>))	epizoic	Eurasia
<i>P. branchialis</i>	48-82 x 27-44	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>))	epizoic (gills)	Europe
<i>P. brevistyla</i> (syn. <i>Vorticella</i>)	80	freshwater, attached to invertebrates (Branchiopoda: leptodorida (<i>Leptodora kindtii</i>))	epizoic	Europe
<i>P. erlangensis</i> (syn. <i>Carchesium</i>)		freshwater, attached to invertebrates (Copepoda: cyclopid (<i>Cyclops</i> , <i>Diacyclops bicuspidatus</i> , <i>Macrocyclops fuscus</i>); Amphipoda: gammarid (<i>Gammarus pulex</i>); Branchiopoda: chirocephalid (<i>Eubbranchipus grubii</i>), daphniid (<i>Daphnia</i> , <i>Simocephalus</i>), ilyocryptid (<i>Ilyocryptus sordidus</i>))	epizoic	Europe
<i>P. gammari</i>		estuarine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus fossarum</i> , <i>locusta</i> , <i>pulex</i>))	epizoic	Europe
<i>P. inconjunctum</i> (syn. <i>Carchesium</i>)		freshwater	free-living	Europe
<i>P. limbatum</i>	78-94 x 46-53	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>))	epizoic	Europe
<i>P. ovatum</i>	32-45 x 26-30	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus fossarum</i> , <i>pulex</i> , <i>Dikeogrammus vilosus</i>))	epizoic	Europe
<i>P. polypina</i> (syn. <i>Sertularia</i> , <i>Carchesium polypinum</i> , <i>C. corymbosum</i> , <i>Epistylis corymbosum</i> , <i>Vorticella spectabilis</i>) [type species]	bimorphic: microzooids 35- 100 x 30-56; macrozooids 95- 140 x 47-85	freshwater, attached to inanimate substrates, detritus, plants (algae, mosses) and invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Carinogammarus</i> , <i>Gammarus</i> <i>fossarum</i> , <i>pulex</i>); Branchiopoda: bosminid (<i>Bosmina</i>), daphniid (<i>Daphnia</i> <i>magna</i>); Decapoda: cambarid (<i>Cambarellus patzouarensis</i> , <i>zempoalensis</i>))	free-living, epiphytic, epizoic	cosmopolitan
<i>P. rhyacophilae</i>		aquatic	free-living	Eurasia
<i>P. simulans</i>	35-45 x 18-28	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>))	epizoic	Europe
<i>P. steinii</i> (syn. <i>Carchesium</i>)	33-53 x 22-30	estuarine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus</i> <i>fossarum</i> , <i>locusta</i> , <i>pulex</i> , <i>roeselii</i> , <i>Dikerogrammus villosus</i>))	epizoic	cosmopolitan
<i>P. umbilicatum</i> (syn. <i>Carchesium</i>)		aquatic	free-living	Caspian Sea
Genus: <i>Pseudovorticella</i> (solitary, hyaline shell, prominent stalk, unbranched, often gregarious with stalks attached to form small pseudo-colonies, stalk with sinusoidal myoneme, contracts in spiral/helical fashion, reticulate silverline system, often with pellicular blisters)				
<i>P. alani</i>	70-90 x 50-65	brackish water	free-living	Asia
<i>P. annulata</i> (syn. <i>Vorticella</i>)	35-40 x 25-30	marine	free-living	Eurasia
<i>P. anomala</i> (syn. <i>Vorticella</i>)	30-40 x 35-40	marine	free-living	Eurasia
<i>P. apogracilis</i>	60-70 x 30-40	marine	free-living	Asia
<i>P. banatica</i> (syn. <i>Vorticella</i>)	60-80 x 50-70	marine	free-living	China
<i>P. bidulphiae</i> (syn. <i>Vorticella</i>)	30-40 x 20-40	marine, attached to inanimate substrates and invertebrates (Bacillariophyta (diatom): biddulphiaceae (<i>Biddulphia</i> <i>sinensis</i>))	free-living, epiphytic	Asia
<i>P. bromelicola</i>	60-75 x 30-50	freshwater, attached to tanks of bromeliads (<i>Guzmania scherzeriana</i>)	free-living, epiphytic	Costa Rica

<i>P. chlamydomphora</i> (syn. <i>Vorticella</i> , <i>V. vestita</i>)	40-80 x 35-65	freshwater, attached to inanimate substrates, detritus, filamentous algae, plants (<i>Utricularia</i>) and invertebrates (Amphipoda: gammarid (<i>Gammarus roeselii</i>); Isopoda: asellid (<i>Asellus aquaticus</i>), and mollusc shells)	free-living, epiphytic, epizoic	Europe
<i>P. chlorelligera</i> (syn. <i>Vorticella</i>)	78-95 x 50	freshwater	free-living	Europe
<i>P. clampi</i>	70-110 x 50-75	marine	free-living	China
<i>P. cylindrica</i> (syn. <i>Vorticella</i>)	40-50 x 45-50	marine, free-living and attached to invertebrates (Hydrozoa: sertulariid (<i>Diphasia</i>))	free-living, epizoic	Eurasia
<i>P. dalianensis</i>	50-60 x 30-35	marine (coastal waters)	free-living	China
<i>P. difficilis</i> (incl. var. <i>magnistriata</i>) (syn. <i>Vorticella</i>)	50-140 x 35-70	marine/estuarine, free-living and attached to invertebrates (Amphipoda: gammarid (<i>Gammarus locusta</i>); Isopoda: idoteid (<i>Idotea chelipes</i>), sphaeromatid (<i>Lekanesphaera rugicauda</i>))	free-living, epizoic	Eurasia
<i>P. elongata</i> (syn. <i>Vorticella</i> , <i>V. conica</i> , <i>multangula</i> , <i>plicata</i> p.p., <i>subcylindrica</i>)	48-150 x 32-44	freshwater or marine, attached to inanimate substrates, algae, plants (<i>Hydrocharis</i>) and invertebrates (Copepoda: cyclopid (<i>Cyclops</i>))	free-living, epiphytic, epizoic	America, Eurasia
<i>P. fasciculata</i> (syn. <i>P. margaritata</i> f. <i>chlorigera</i> (<i>chlorelligera</i>))		freshwater, attached to filamentous bacteria (<i>Anabaena</i> , <i>Microcystis</i> , <i>Tabellaria</i>)	free-living, epiphytic?	Europe
<i>P. faurefremietii</i>	85-95 x 45-50	marine	free-living	China
<i>P. foissneri</i>	20-30 x 40-50	marine	free-living	China
<i>P. haiboensis</i>	65-75x25-35	marine		China
<i>P. jaerae</i> (syn. <i>Vorticella</i>)	40-55 x 25-45	marine/estuarine, attached to inanimate substrates and invertebrates (Isopoda: janirid (<i>Jaera albifrons</i> , <i>marina</i>))	free-living, epizoic	Eurasia
<i>P. jankowskii</i>	40-50 x 40-45	marine	free-living	Asia
<i>P. jiangi</i>	75-90 x 55-65	marine (prawn culture tank)	free-living	China
<i>P. liangae</i>	75-85x70-80	marine		China
<i>P. lima</i> (syn. <i>Vorticella</i>)	60-70 x 30	marine, attached to inanimate substrates and to invertebrates (Isopoda: sphaeromatid (<i>Sphaeroma serratum</i> , <i>Nassa bidentata</i>))	free-living, epizoic (legs)	Eurasia
<i>P. longa</i>	30-45 x 15-25	marine (mollusc-breeding pond)	saprozoic	China
<i>P. margaritata</i> (syn. <i>Vorticella</i>)	59-70 x 50	freshwater, attached to plants (<i>Utricularia</i> , <i>Ceratophyllum</i> , <i>Lemna</i> , <i>Potamol?</i> (<i>Potamogeton</i>) <i>crispus</i>)	epiphytic	Europe
<i>P. marina</i> (syn. <i>Vorticella</i> , <i>V. minuta</i>)	35-70 x 35-50	marine, attached to inanimate substrates, algae, and invertebrates (Decapoda: penaeid (<i>Penaeus chinensis/orientalis</i>))	free-living, epiphytic, epizoic	Eurasia
<i>P. micata</i> (syn. <i>Vorticella</i>)	60-70 x 40-50	marine	free-living	Eurasia
<i>P. mollis</i> (syn. <i>Vorticella</i>)	40-45 x 25	freshwater, attached to plants (<i>Lemna</i>)	free-living, epiphytic	Europe
<i>P. monilata</i> [type species] (syn. <i>Vorticella</i> , <i>V. lockwoodi</i>)	40-80 x 35-60	freshwater, attached to inanimate substrates, detritus, seston, filamentous cyanobacteria (<i>Anabaena flos-aquae</i>), plants (<i>Lemna</i> , <i>Utricularia</i>) and invertebrate animals (Copepoda: cyclopid (<i>Cyclops viridis</i>))	free-living, epiphytic, epizoic	Eurasia, Americas
<i>P. mutans</i> (syn. <i>Vorticella</i>)	65-95 x 18-25	freshwater	free-living	Europe
<i>P. nebulifera</i> (syn. <i>Vorticella</i> , <i>V. similis</i> , <i>cavolini</i>)	38-90 x 20-50	freshwater and marine, attached to inanimate substrates, detritus, plants (including planktonic algae) and	free-living, epiphytic, epizoic	Eurasia, America

		invertebrate animals (Isopoda: asellid (<i>Asellus aquaticus</i>), idotheid (<i>Idothea baltica</i>); Copepoda: cyclopid (<i>Cyclops strenuus</i> , <i>viridis</i>); Decapoda: carcinid (<i>Carcinus mediterraneus</i>), penaeid (<i>Penaeus chinensis/orientalis</i>), insect larvae and mollusc shells)		
<i>P. papillata</i>	35-80 x 22-50	freshwater		
<i>P. paracratera</i>	40-90 x 60-145	marine	free-living	China
<i>P. paraformicata</i>	20-30 x 20-30	marine	free-living	China
<i>P. parakenti</i>	50-60 x 40-45	marine	free-living	China
<i>P. paramarina</i>	50-60 x 30-40	marine	free-living	China
<i>P. parannulata</i>	45-55 x 30-35	marine	free-living	China
<i>P. patellina</i> (syn. <i>Vorticella</i>)	55-110 x 50-100	marine, attached to inanimate substrates and crabs (Decapoda: carcinid (<i>Carcinus mediterraneus</i>), polybiid (<i>Macropipus holsatus</i>))	free-living, epizoic (body, legs)	Europe
<i>P. pattersoni</i>	40-50 x 30-40	marine	free-living	China
<i>P. pseudocampanula</i>	32-50 x 20	freshwater	free-living	Europe
<i>P. pseudokenti</i>		marine	free-living	China
<i>P. punctata</i> (syn. <i>Vorticella</i> , <i>V. perlata</i> , <i>subconica</i>)	40-57 x 45-67	marine, attached to inanimate substrates and invertebrates (Decapoda: carcinid (<i>Carcinus maenas</i>), crangonid (<i>Crangon crangon</i>), palaemonid (<i>Palaemon adspersus</i>); Amphipoda: gammarid (<i>Gammarus locusta</i>); Isopoda: janirid (<i>Jaera albifrons</i>); Hydrozoa: sertulariid (<i>Diphasia abictina</i>); Echinodermata: asteriid (<i>Asterias rubens</i>))	free-living, epizoic	Europe
<i>P. quadrata</i>	65-80 x 55	freshwater, attached to inert substrates and invertebrates (Decapoda: cambarid (<i>Cambarellus patzcuarensis</i>))	epizoic	Europe, Mexico
<i>P. sawwaldensis</i>	35-45 x 20	freshwater	free-living	Europe
<i>P. shii</i>	45-55 x 20-30	marine	free-living	China
<i>P. sinensis</i>	50-60 x 35-45	marine	free-living	China
<i>P. sphagni</i>	40-50 x 30	freshwater (and <i>Sphagnum</i> bogs)	free-living	Europe
<i>P. stilleri</i>	85 x 80	freshwater, attached to plants (<i>Lemna</i>)	epiphytic	Europe
<i>P. verrucosa</i> (syn. <i>Vorticella</i> , <i>V. singularis</i>)	30-60 x 30-65	estuarine, attached to inert substrates and invertebrates (Decapoda: laomediid (<i>Laomedea</i>))	free-living, epizoic	Eurasia
<i>P. zhengae</i>	40-80 x 60-100	marine	free-living	China
<i>P. zhejiangensis</i>	50-70 x 45-70	brackish (coastal pond)	free-living	China
<i>P. zooanthelligera</i> (syn. <i>Vorticella</i>)	40-42 x 40	freshwater	free-living	Eurasia
Genus: <i>Ruthiella</i> (stalk, branched, forms small colonies with several zooids sharing asymmetric cup-like loricae, discontinuous straight myonemes short and not progressing beyond forks in stalk, contracts in zig-zag fashion)				
<i>R. gammari</i> [type species]	120 x 30-50	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus pulex</i> , <i>Carinogammarus roeselii</i>))	epizoic (labium)	Europe
Genus: <i>Spinivorticella</i> (<i>Vorticella</i> -like, but zooids with distinct radial spines)				
<i>S. echini</i> (<i>echina</i>) (syn. <i>Vorticella</i> , <i>Spinivorticellides</i> , <i>Echinovorticella</i>)	30-45 x 20-40	freshwater (benthic)	free-living	Africa, North America
<i>S. voeltzkowi</i> (syn. <i>Vorticella</i> , <i>Pseudovorticella</i> , <i>Spinivorticellides</i>)		freshwater	free-living	Europe
Genus: <i>Systylis</i> (prominent stalk, branched, colonial, noncontractile without myoneme, branches of stalk terminate in rosettes of many (40-160) zooids, peristome with lip)				
<i>S. hoffi</i> [type species]	200-265	freshwater (vernal pools, some alkaline)	free-living	Europe, North America

Genus: <i>Tucolesca</i> (stalked, zooid with long prominent cilia, without peristomial lip, when zooid contracts the peristome remains open with cilia extended while stalk folds in loose coils)				
<i>T. mirabilis</i> [type species as <i>Leptodiscus</i>]	27-30 x 19	hypersaline lake	free-living	Romania
Genus <i>Vorticella</i> (prominent stalk, unbranched bearing single zooids, often gregarious with stalks attached to form small pseudo-colonies, stalk with sinusoidal myoneme, contracts in spiral/helical fashion, oral ciliature making 1-1½ turns, one epistomial membrane, transverse silverline system)				
<i>V. convallaria</i> -complex				
<i>V. convallaria</i> (incl. var. <i>compacta</i> , <i>similis</i> , f. <i>citrina</i>) (syn. <i>V. brevipes</i> , <i>chinensis</i> , <i>citrina</i> , <i>cothurnata</i> , <i>cyathina</i> , <i>cyclopis</i> , <i>limosa</i>) [type species as <i>Hydra</i>]	30-120 x 22-70	freshwater/marine, attached to inanimate substrates, detritus, algae, moss, plants (<i>Lemna minor</i>) and invertebrate animals (Amphipoda: gammarid (<i>Gammarus pulex</i> , <i>tigrinus</i>), corophiid (<i>Corophium curvispinum</i>); Branchiopoda: daphniid (<i>Scapholeberis mucronata</i> , <i>Simocephalus vetulus</i>), sidid (<i>Sida crystallina</i>), triopsid (<i>Lepidurus apus</i>); Copepoda: cyclopid (<i>Cyclops strenuus</i> , <i>viridis</i> , <i>Macrocylops albidus</i> , <i>fuscus</i>), lernaed (<i>Lernaea cyprinacea</i>); Isopoda: asellid (<i>Asellus aquaticus</i>); Ostracoda: cyclocyprinid (<i>Cyclocypris ovum</i>); Decapoda: cambarid (<i>Cambarellus zempoalensis</i>), carcinid (<i>Carcinus mediterraneus</i>), potamid (<i>Potamon</i>); insect larvae and mollusc shells)	free-living, epiphytic, epizoic	cosmopolitan
<i>V. microstoma</i> -complex (comprising <i>V. microstoma</i> , <i>aequilata</i> , <i>alpestris</i>)				
<i>V. microstoma</i> (incl. var. <i>defluviatilis</i> , <i>typica</i> , f. <i>elongata</i> , <i>hians</i> , <i>turgescens</i> , <i>typica</i>) (syn. <i>V. chydoricola</i> , <i>cupifera</i> , <i>cyclopicola</i> , <i>fluvialis</i> , <i>longimacronucleata</i> , <i>magna</i> , <i>mammillata</i> , <i>partita</i> , <i>pileolata</i> , <i>submicrostoma</i>)	30-120 x 22-50	freshwater (esp. stagnant and activated sludge), attached to inanimate substrates, detritus, cyanobacterial colonies (<i>Microcystis</i>), plants (<i>Utricularia</i>) and invertebrate animals (Amphipoda: gammarid (<i>Gammarus tigrinus</i> , <i>roeselii</i>); Branchiopoda: chydorid (<i>Rhynchotalona rostrata</i> , <i>Disparalona rostrata</i>), daphniid (<i>Scapholeberis kingi</i>), eurycercid (<i>Eurycercus lamellatus</i>), lernaed (<i>Lernaea cyprinacea</i>), macrothricid (<i>Macrothrix laticornis</i>); Copepoda: cyclopid (<i>Cyclops strenuus</i> , <i>viridis</i> , <i>Megacyclops viridis</i>); Isopoda: asellid (<i>Asellus aquaticus</i>), idotheid (<i>Idothea baltica</i>); Decapoda: cambarid (<i>Camberellus patzcuarensis</i>), carcinid (<i>Carcinus mediterraneus</i>), penaeid (<i>Penaeus chinensis/orientalis</i>))	free-living, epiphytic, epizoic	cosmopolitan
<i>V. aequilata</i>	40-50 x 20	freshwater/marine, attached to inanimate substrates and invertebrates (Amphipoda: gammarid (<i>Gammarus tigrinus</i>))	free-living, epizoic	Europe
<i>V. alpestris</i>	35-45 x 20	freshwater	free-living	Europe
<i>V. octava</i> -complex (comprising <i>V. octava</i> , <i>hamata</i> , <i>limnetis</i> , <i>striata</i>)				
<i>V. octava</i>	23-60	freshwater, attached to inanimate substrates, detritus, algae, plants (<i>Utricularia</i>) and invertebrate animals (Copepoda: cyclopid (<i>Cyclops</i>); Amphipoda: gammarid (<i>Gammarus tigrinus</i>); Branchiopoda: chydorid (<i>Chydorus sphaericus</i>), daphniid (<i>Daphnia magna</i> , <i>longispina</i> , <i>obtusa</i> , <i>Simocephalus vetulus</i> , <i>serratulus</i> , <i>Scapholeberis mucronata</i> , <i>kingi</i> , <i>Ceriodaphnia quadrangula</i>), eurycercid	free-living, epiphytic, epizoic	Eurasia, America

		(<i>Eurycercus lamellatus</i>), macrothricid (<i>Macrothrix laticornis</i>), polyphemid (<i>Polyphemus pediculus</i>), sidid (<i>Diaphanosoma brachyurum</i>); Decapoda: penaeid (<i>Penaeus chinensis/orientalis</i>)		
<i>V. hamata</i> (syn. <i>Vorticella delicatulata</i>)	40 x 15	freshwater or marine	free-living	Europe, North America
<i>V. limnetis</i>	50 x 35	freshwater	free-living	Europe
<i>V. striata</i> (syn. <i>V. conochili</i> , <i>latestriata</i> , <i>lemnae</i> , <i>minima</i> , <i>oceanica</i> , <i>pusilla</i> , <i>pyrum</i> , <i>pyumcollaris</i> , <i>rhabdostylodes</i> , <i>striatula</i> , <i>suboctava</i>)	20-60 x 15-40	freshwater/marine (rarely terrestrial), attached to inanimate substrates, detritus, plants (<i>Lemna</i> , <i>Potamogeton crispus</i>), diatoms (<i>Stephanodiscus</i>), algae and invertebrate animals (Amphipoda: gammarid (<i>Gammarus fasciatus</i> , <i>tigrinus</i>); Branchiopoda: chydorid (<i>Chydorus sphaericus</i>), daphniid (<i>Ceriodaphnia quadrangula</i> , <i>Daphnia longispina</i> , <i>magna</i> , <i>obtusa</i> , <i>pulex</i> , <i>Scapholeberis kingi</i> , <i>mucronata</i> , <i>Simocephalus serratulus</i> , <i>vetulus</i>), eurycercid (<i>Eurycercus lamellatus</i>), macrothricid (<i>Macrothrix laticornis</i>), polyphemid (<i>Polyphemus pediculus</i>), sidid (<i>Diaphanosoma brachyurum</i>); Isopoda: asellid (<i>Asellus aquaticus</i>), idoteid (<i>Idotea chelipes</i>), janirid (<i>Jaera albifrons</i>), sphaerotatid (<i>Lekanesphaera rugicauda</i> , <i>Sphaeroma serratum</i>); Mysida: mysid (<i>Neomysis integer</i>); Gastropoda: planorbid (<i>Planorbis spirorbis</i>); Hydrozoa: sertulariid (<i>Sertularia pumila</i>); Rotifera: conochilid (<i>Conochilus unicornis</i>); Decapoda: cambarid (<i>Camberellus patzcuarensis</i>), crangonid (<i>Crangon crangon</i>), penaeid (<i>Penaeus chinensis/orientalis</i>); Ostracoda: cytherdeid (<i>Cyprideis litoralis</i>) and insect larvae)	free-living, epiphytic, epizoic	Eurasia, America
Other <i>Vorticella</i> species				
<i>V. aerotenci</i>	90-140 x 32-60	freshwater (activated sludge)	free-living	Russia
<i>V. alba</i> (syn. <i>Haplocaulus</i>)	60-80 x 25	freshwater, attached to inanimate substrates and invertebrates (Amphipoda: gammarid (<i>Gammarus pulex</i>); Copepoda: cyclopid (<i>Cyclops viridis</i> , <i>Macrocyclops albidus</i>)	free-living, epizoic	Europe
<i>V. annulata</i> (syn. <i>V. brevistyla</i> var. <i>annulata</i>)	55 x 35	estuarine	free-living	Eurasia
<i>V. apunctata</i>		freshwater	free-living	Europe
<i>V. ascoideum</i>		freshwater	free-living	Europe
<i>V. biddulphae</i>		marine	free-living	Europe
<i>V. bipartita</i>		freshwater	free-living	Europe
<i>V. bivacuolata</i>	95-120 x 55-68	freshwater (and activated sludge)	free-living	Asia
<i>V. bosminae</i>	25-40 x 20-30	freshwater/brackish, attached to inanimate substrates and invertebrates (Branchiopoda: bosminid (<i>Bosmina longirostris</i>); Copepoda: cyclopid (<i>Mesocyclops leuckarti</i> , <i>viridis</i> , <i>Thermocyclopsis hyalinus</i>)	free-living, epizoic	Europe
<i>V. brachionicola</i>		freshwater, attached to invertebrates (Rotifera: brachionid (<i>Brachionus</i>))	epizoic	Europe
<i>V. brevistyla</i>		marine	free-living	North America

<i>V. cacabuoides</i>		freshwater	free-living	Europe
<i>V. calciformis</i>	90 x 65	marine	free-living	Europe
<i>V. campanula</i> (syn. <i>V. aperta</i> , <i>cylindrica</i> p.p., <i>dilatata</i> , <i>lunaris</i> , <i>macrostoma</i> , <i>margaritifera</i>)	50-160 x 35-100	freshwater/marine, attached to inanimate substrates, detritus, plants (<i>Ceratophyllum</i> , <i>Lemna minor</i> , <i>Myriophyllum</i>) and invertebrate animals (Amphipoda: gammarid (<i>Gammarus pulex</i> , <i>locusta</i> , <i>Carinogrammus</i>); Branchiopoda: daphniid (<i>Ceriodaphnia reticulata</i> , <i>Daphnia magna</i> , <i>obtusa</i> , <i>pulex</i> , <i>rosea</i> , <i>Scapholeberis mucronata</i> , <i>Simocephalus vetulus</i>), polyphemid (<i>Polyphemus pediculus</i>), sidid (<i>Sida crystallina</i> , <i>Diaphanosoma</i>); Copepoda: cyclopid (<i>Cyclops viridis</i> , <i>Eucyclops serratulus</i>); Decapoda: cambarid (<i>Cambarellus patzcuarensis</i>), carcinid (<i>Carcinus maenas</i> , <i>mediterraneus</i>), penaeid (<i>Penaeus chinensis/orientalis</i>); Isopoda: asellid (<i>Asellus aquaticus</i>), idotheid (<i>Idothea baltica</i>), sphaeromatid (<i>Sphaeroma terebrans</i>); mollusc shells and insect larvae)	free-living, epiphytic, epizoic	cosmopolitan
<i>V. campanulata</i>	45 x 50	freshwater or marine	free-living	Europe
<i>V. chamaeleontina</i>		freshwater	free-living	Europe
<i>V. chiangi</i>	35-50x35-50	marine (aquaculture ponds)		China
<i>V. chlorostigma</i> (syn. <i>V. chlorellata</i> , <i>Carchesium</i>)	75-110 x 58-85 (44-64 x 25-48)	freshwater, planktonic and attached to colonial bacteria (<i>Gloeotricha</i>) and plants (bladderwort <i>Utricularia</i>)	free-living, epiphytic	Europe, Americas
<i>V. cinctula</i>		freshwater	free-living	Europe
<i>V. claparedi</i>		marine, attached to crabs (Decapoda: carcinid (<i>Carcinus mediterraneus</i>))	epizoic (carapace)	Black Sea
<i>V. communis</i> (syn. <i>V. subsphaerica</i>)	30-36 x 25	freshwater or marine, attached to invertebrates (Decapoda: cambarid (<i>Cambarellus patzcuarensis</i>); Hydrozoa: sertulariid (<i>Sertularia pumila</i>))	epizoic	Europe, North America
<i>V. confluens</i>		freshwater	free-living	Europe
<i>V. corrugis</i>	12	freshwater, attached to algae	epiphytic	Europe
<i>V. cratera</i> (syn. <i>V. dudekemi</i>)	120-130 x 100	freshwater or marine	free-living	Eurasia
<i>V. craterella</i>		freshwater	free-living	Europe
<i>V. cupularis</i>		freshwater	free-living	Europe
<i>V. cupulifera</i>		freshwater	free-living	Europe
<i>V. curvifrons</i>	20	freshwater, attached to algae	epiphytic	Europe
<i>V. curvipes</i>		freshwater, attached to inanimate substrates and plants (watercress)	free-living, epiphytic	Europe
<i>V. cyatiformis</i>		freshwater	free-living	Europe
<i>V. cyclopis</i>	55	marine, attached to invertebrates (Copepoda: cyclopid (unspecified))	epizoic	Europe
<i>V. dejecta</i>		freshwater	free-living	Europe
<i>V. dimorpha</i>	32-35 x 15-20	freshwater, attached to inanimate substrates and invertebrates (Rotifera: conochilid (<i>Conochilus unicornis</i>))	epizoic	Europe
<i>V. dubia</i>	40	freshwater	free-living	Europe
<i>V. exilis</i>	48-60 x 15-20	freshwater, attached to snails (Gastropoda: lymnaeid (<i>Lymnaea stagnalis</i>)) and damselfly larvae (Zygoptera: lestid (<i>Lestes virens</i>))	free-living, epizoic	Europe
<i>V. extinctoria</i>		freshwater	free-living	Europe
<i>V. extuberrans</i>		freshwater	free-living	Europe
<i>V. filopes</i>		freshwater	free-living	Europe
<i>V. flexipes</i>		freshwater	free-living	Europe

<i>V. flexuosa</i>	126-144 x 70	freshwater, attached to liverworts (<i>Ricciocarpos natans</i>) and invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>))	epiphytic, epizoic	Europe
<i>V. fluviatilis</i>		freshwater	free-living	Europe
<i>V. fornicata</i>	24-42	marine, attached to algae (<i>Laminaria</i>)	epiphytic	Europe, North America
<i>V. fragilariae</i>		freshwater, attached to diatoms	epiphytic	Europe
<i>V. fromenteli</i> (syn. <i>V. cucullus</i>)	70-90 x 30-50	freshwater, attached to inanimate substrates, detritus, and invertebrates (Decapoda: cambarid (<i>Cambarellus patzcuarensis</i>))	free-living	Eurasia
<i>V. geispicae</i>	68-122 x 24-48	freshwater (activated sludge)	free-living	Russia
<i>V. geminata</i>		freshwater	free-living	Europe
<i>V. globosa</i> (syn. <i>V. urnula</i>)	25-65 x 20-45	freshwater, attached to inanimate substrates and invertebrates (Copepoda: cyclopid (<i>Macrocylops fuscus</i>); Decapoda: atyid (<i>Caridina lanceolata</i>))	free-living, epizoic	Eurasia
<i>V. globularia</i> (syn. <i>V. salina</i> , <i>sphaerica</i>)	160 x 150	freshwater, attached to inanimate substrates and invertebrates (Copepoda: cyclopid (<i>Cyclops</i>))	free-living, epizoic	Europe
<i>V. gracilis</i>	50-85 x 25-45	freshwater, attached to inanimate substrates and plants (tanks of bromeliads)	free-living, saprobic	Europe, Costa Rica
<i>V. granulata</i>	50-60 x 30-35	marine	free-living	Europe
<i>V. gyrans</i>		freshwater	free-living	Europe
<i>V. halophila</i>	40-50 x 30-35	freshwater, attached to detritus	free-living	Europe
<i>V. hirsuta</i>		freshwater	free-living	Europe
<i>V. idiothea</i>		marine, attached to invertebrate (Isopoda: idoteid (<i>Idothea baltica</i>))	epizoic (body)	Black Sea
<i>V. incisa</i>	65-80 x 50-55	freshwater, attached to plants (<i>Myriophyllum</i>)	epiphytic	Europe
<i>V. inclinata</i>		freshwater, attached to inanimate substrates and plants (<i>Lemna</i>)	free-living, epiphytic	Europe
<i>V. inconstans</i>	20-26	freshwater, attached to invertebrates (Branchiopoda: macrothricid (<i>Macrothrix hirsuticornis</i>))	epizoic	Europe
<i>V. incurva</i>		freshwater	free-living	Europe
<i>V. inflata</i>		freshwater	free-living	Europe
<i>V. inflexa</i>		freshwater	free-living	Europe
<i>V. invaginata</i>		freshwater	free-living	Europe
<i>V. kenti</i> (syn. <i>V. floridensis</i> , <i>spectabilis</i>)	85-170 x 60	freshwater, attached to plants (<i>Lemna</i> , Cypress swamps)	epiphytic	North America
<i>V. latifunda</i>	60 x 30	freshwater, attached to crayfish (Decapoda: cambarid (<i>Cambarellus patzcuarensis</i>) and damselfly larvae (Zygoptera: lestid (<i>Lestes sponsa</i> , <i>virens</i>)))	epizoic	Mexico
<i>V. lichenicola</i> (syn. <i>V. inconstantans</i>)	50-65 x 25-30	freshwater, attached to inanimate substrates, lichen, mosses and invertebrates (Branchiopoda: daphniid (<i>Daphnia pulex</i>), macrothricid (<i>Macrothrix hirsuticornis</i>))	free-living, epiphytic, epizoic	Greenland
<i>V. longifilum</i> (syn. <i>V. macrocaulis</i> , <i>simplex</i>)	45-90 x 30-35	freshwater, attached to plants (<i>Myriophyllum</i> , <i>Lemna</i>) and invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Dikerogrammus haemobaphes</i> , <i>Gammarus tigrinus</i>); Ostracoda (unspecified))	epiphytic, epizoic	Europe
<i>V. longiseta</i>	82 x 50	marine	free-living	Europe
<i>V. longitricha</i>	30 x 25	marine, attached to invertebrates (Amphipoda: gammarid (unspecified))	epizoic	Europe

<i>V. lutea</i>	140 x 75-80	freshwater, attached to plants (<i>Myriophyllum</i> , <i>Lemna</i>)	epiphytic	Europe
<i>V. lymnaearum</i>	26-30 x 25-35	freshwater, attached to snails (Gastropoda: lymnaeid (<i>Lymnaea natalensis</i>))	epizoic	Africa
<i>V. macrophyta</i>	38-50 x 15-20	freshwater, attached to plants (<i>Lemna</i>)	epiphytic	North America
<i>V. macrostyla</i>	50 x 30	freshwater	free-living	Egypt
<i>V. mamillata</i>		freshwater marshes	free-living	Europe
<i>margaritata</i>				
<i>V. marginata</i>	70-90 x 32-45	freshwater, attached to inanimate substrates, detritus, filamentous algae (<i>Cladophora</i> , <i>Enteromorpha intestinalis</i>), plants and invertebrates (Isopoda sowbug)	free-living, epiphytic, epizoic	Eurasia
<i>V. micra</i>		marine, attached to crabs (Decapoda: carcinid (<i>Carcinus maenas</i>))	epizoic (body)	Black Sea
<i>V. microscopica</i>	12-15 x 8	freshwater	free-living	Europe
<i>V. molesta</i>		freshwater	free-living	Europe
<i>V. muralis</i>	90-125 x 35-45	freshwater and <i>Sphagnum</i> bogs	epiphytic	Europe
<i>V. nebulifera</i>		freshwater, attached to plants (<i>Lemna</i>)	epiphytic	Europe
<i>V. nigra</i>	15-16	freshwater	free-living	Europe
<i>V. nutans</i> (syn. <i>V. gemella</i> , <i>procumbens</i> , <i>Epistylis gemella</i>)	60-85 x 25-30	freshwater or marine, attached to moss, plants (<i>Stratiotes</i>) and snails (Gastropoda: planorbid (<i>Planorbis</i>))	epiphytic, epizoic	Eurasia
<i>V. obconica</i> (syn. <i>V. conica</i>)	55-100 x 45	estuarine, attached to invertebrates (Copepoda: cyclopid (<i>Cyclops</i>); Polychaeta: serpulid (<i>Spirorbis</i>))	epizoic	North America, Europe
<i>V. oblonga</i>		marine	free-living	Europe
<i>V. ondulata</i>		freshwater	free-living	Europe
<i>V. operculariformis</i>	45-55 x 30-50	freshwater	free-living	Europe
<i>V. operculata</i>		freshwater	free-living	India
<i>V. ophiocomae</i>		marine, attached to brittle star (Echinodermata: ophiocomid (<i>Ophiocoma neglecta</i>))	epizoic	Europe
<i>V. ovum</i> (syn. <i>V. incerta</i> , <i>Carchesium incerta</i>)	90-105 x 50-60	freshwater or marine, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Gammarus</i>))	epizoic	Europe
<i>V. parachiangi</i>	50-65 x 55-70	marine (mangrove)	free-living	China
<i>V. paralima</i>	35-50 x 20-30	brackish water (mangrove)	free-living	Europe
<i>V. parapulchella</i>	25-30 x 20-25	marine, attached to inanimate substrates	free-living	China
<i>V. parasita</i> (syn. <i>V. ephemerae</i>)	40 x 10	freshwater, attached to mayfly larvae (Ephemeroptera: ephemerid (unspecified))	epizoic	North America
<i>V. parvula</i>		freshwater	free-living	Europe
<i>V. peterhoffi</i>	62-80 x 35-46	freshwater (activated sludge)	free-living	Russia
<i>V. picta</i> (syn. <i>Carchesium</i> , <i>V. appunctata</i>)	35-90 x 20-50	freshwater, attached to inanimate substrates, detritus, algae, plants and invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Rotifera: collothecid (<i>Stephanoceros</i>))	free-living, epiphytic, epizoic	Eurasia, Americas
<i>V. plicatula</i>		freshwater	free-living	Europe
<i>V. plicosa</i>	12	freshwater, attached to plants (<i>Nenuphar</i>)	epiphytic	Europe
<i>V. poznaniensis</i>	68-85 x 62-68	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Copepoda: cyclopid (<i>Cyclops</i>))	epizoic	Europe
<i>V. pulchella</i>	46 x 30	marine, attached to invertebrates (Copepoda: cyclopid (<i>Cyclops</i>); Decapoda: penaeid (<i>Penaeus chinensis/orientalis</i>))	epizoic	Asia
<i>V. pulchra</i>	40-50 x 20	estuarine, attached to invertebrates (Decapoda: cambarid (<i>Cambarellus</i>))	epizoic	Mexico

		<i>zempoalensis</i>)		
<i>V. pyriforme</i> (syn. <i>V. intermissa</i>)	45-70 x 30-40	freshwater or marine	free-living	Europe
<i>V. pyxidata</i>		freshwater	free-living	Europe
<i>V. quadrangularis</i> (syn. <i>V. sinuata</i> , <i>zealandica</i>)	125-200 x 60	freshwater, attached to plants (<i>Myriophyllum</i>)	epiphytic	Europe, New Zealand
<i>V. regularis</i>				
<i>V. repanda</i>		freshwater	free-living	Europe
<i>V. rhabdophora</i>	80 x 30	fresh and brackish water	free-living	Europe
<i>V. rotunda</i>	49 x 30	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Branchiopoda: daphniid (<i>Daphnia magna</i>); Amphipoda: gammarid (<i>Gammarus tigrinus</i>) and damselfly larvae (Zygoptera: lestid (<i>Lestes</i>))	epizoic	Europe
<i>V. rotundata</i>		freshwater	free-living	Europe
<i>V. rubristigma</i>	30-35 x 20	freshwater	free-living	North America
<i>V. rugata</i>		freshwater, attached to inanimate substrates and plants (<i>Ranunculus</i> <i>aquatilis</i>)	free-living, epiphytic	Europe
<i>V. sagittaricola</i>	13	freshwater, attached to plants (<i>Sagittaria</i> <i>sagittifolia</i>)	epiphytic	Europe
<i>V. scapiformis</i>	40-50 x 40-55	freshwater (sewage outlet)	free-living	China
<i>V. sepulcreti</i>	45-55 x 25-30	freshwater	free-living	Eurasia
<i>V. sinica</i>	20-30 x 10-20	marine	free-living	China
<i>V. sphaeroidalis</i>	20-30 x 15-25	freshwater (ditch)	free-living	China
<i>V. sphaeroides</i>		freshwater	free-living	Europe
<i>V. sphaeroma</i>		marine, attached to invertebrates (Isopoda: sphaeromatid (<i>Sphaeroma</i> <i>serratum</i>))	epizoic (body)	Black Sea
<i>V. spuripicta</i>		freshwater (sewage outlet)	free-living	China
<i>V. subcylindrica</i>	15	freshwater	free-living	Europe
<i>V. subprocumbens</i> (syn. <i>V. nana</i> , <i>solitaria</i> , <i>Epistylis solitaria</i>)	27-50 x 20-30	freshwater or marine, attached to plants (<i>Lemna trisulca</i>) and invertebrates (Branchiopoda (unspecified cladocerans); Gastropoda: planorbid (<i>Planorbis</i>))	epiphytic, epizoic	Europe
<i>V. subsinuata</i> (syn. <i>V.</i> <i>longipharyngea</i>)	40-50 x 35-40	freshwater	free-living	Europe
<i>V. sucreta</i>		freshwater	free-living	Europe
<i>V. supina</i>	12	freshwater, attached to plants (<i>Potamol?</i> (<i>Potamogeton crispus</i>))	epiphytic	Europe
<i>V. sureta</i>	11	freshwater	free-living	Europe
<i>V. szczepanowskii</i> (syn. <i>V. plicata p.p.</i>)	43 x 25	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>))	epizoic	Europe
<i>V. telescopoides</i> (syn <i>V. telescopica</i> , <i>telescopiformis</i>)	55-70 x 15-25	freshwater or marine	free-living	Europe
<i>V. tenuis</i>		freshwater, attached to inanimate substrates and plants (<i>Lemna</i> , <i>Myriophyllum</i>)	free-living, epiphytic	Europe
<i>V. tornatilis</i>		freshwater	free-living	Europe
<i>V. tripartita</i>		freshwater	free-living	Europe
<i>V. turbinata</i>		freshwater	free-living	Europe
<i>V. turgicula</i>	60-70 x 52-64	freshwater, attached to mosses	epiphytic	Asia
<i>V. umbilicola</i>	8-10	freshwater, attached to invertebrates (Gastropoda: planorbid (<i>Planorbis</i>))	epizoic	Europe
<i>V. vaginata</i>		freshwater swamp	free-living	Europe
<i>V. ventosa</i>	10-14	freshwater, attached to plants (<i>Callitriche</i>)	epiphytic	Europe
<i>V. venusta</i>	35-44 x 23-30	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>))	epizoic	Europe

<i>V. vernalis</i>	40-56 x 20-44	freshwater, attached to inanimate substrates, diatoms (<i>Fragilaria</i>) and rotifers (Rotifera: collothecid (<i>Stephanoceros</i>))	free-living, epiphytic, epizoic	Europe, North America
Genus Vorticellides (prominent stalk, unbranched bearing single zooids, often gregarious with stalks attached to form small colonies, with sinusoidal myoneme, contracts in spiral/helical fashion, oral ciliature making 1-1½ turns, small barrel-shaped bodies with 2 epistomial membranes (ciliated only in swimmers), transverse silverline system)				
<i>V. aquadulcis</i> -complex (comprising <i>Vorticella aquadulcis</i> , <i>astyliformis</i> , <i>costata</i> , <i>platysoma</i>)				
<i>V. aquadulcis</i> (syn. <i>Vorticella</i> , <i>V. striata</i> p.p.)	15-55 x 10-35	freshwater (and activated sludge), attached to inanimate substrates, detritus, filamentous algae (<i>Enteromorpha</i> , <i>Cladophora</i>), diatoms (<i>Asterionella formosa</i> , <i>Fragilaria crotonensis</i>), mosses, plants (<i>Lemna</i> , bromeliads) and invertebrates (Branchiopoda: daphniid (<i>Daphnia galeata</i> , <i>longispina</i>), leptodorida (<i>Leptodora kindtii</i>); Ephemeroptera: baetid (<i>Baetis</i> mayfly larvae), Rotifera (unspecified))	free-living, epiphytic, epizoic	cosmopolitan
<i>V. astyliformis</i>	28-50 x 12-45	freshwater and terrestrial (alpine soil)	free-living	Europe
<i>V. costata</i> (syn. <i>V. octava</i> f. <i>costata</i>)	20-28 x 15-20	freshwater	free-living	Europe
<i>V. platysoma</i>	22-25 x 15	freshwater, attached to inanimate substrates, algae and invertebrates (Branchiopoda: daphniid (<i>Scapholeberis mucronata</i>))	free-living, epizoic	Europe
<i>V. infusionum</i> -complex (comprising <i>Vorticella infusionum</i> , <i>hians</i> , <i>utriculus</i>)				
<i>V. infusionum</i> (syn. <i>Vorticella</i> , <i>V. abbreviata</i> , <i>microstoma</i> p.p., <i>striata</i> p.p.)	30-90 x 18-40	freshwater/marine (rarely terrestrial), attached to inanimate substrates, detritus, plants (<i>Lemna</i>) and invertebrates (Copepoda: cyclopoid (<i>Cyclops viridis</i>); Branchiopoda: daphniid (<i>Daphnia pulex</i>) and unspecified cladocerans; Amphipoda: gammarid (<i>Gammarus roeselii</i>); Isopoda: asellid (<i>Asellus aquaticus</i>); Diptera: culicid (<i>Culex pipiens</i> larvae); Decapoda: cambarid (<i>Cambarellus patzcuarensis</i>))	free-living, epiphytic, epizoic	cosmopolitan
<i>V. hians</i>	60	freshwater (microaerophilic)	free-living	Europe
<i>V. utriculus</i> (syn. <i>Vorticella striata</i> f. <i>utriculus</i>)	35-60 x 18-30	marine, attached to invertebrates (Decapoda: penaeid (<i>Penaeus chinensis/orientalis</i>))	epizoic	China
Family: Zoothamniidae				
Genus: Craspedomyoschiston (prominent stalk, colonial, continuous straight myoneme does not continue down main trunk of colony, only upper colony contractile in zig-zag fashion, stalk with flattened lorica-like extensions)				
<i>C. duplicatum</i>		marine, attached to opossum shrimp (Mysida: mysid (<i>Neomysis integer</i>))	epizoic	Europe
<i>C. sphaeromae</i> (syn. <i>Myoschiston</i>) [type species]		estuarine, attached to invertebrates (Isopoda: sphaerotid (<i>Lekanesphaera rugicauda</i>))	epizoic	Europe
Genus: Haplocaulus (solitary zooids, prominent stalks, unbranched, contractile, straight myonemes, contract in zig-zag fashion, peristomial disc, striated pellicles, attached to plant, animal and inanimate substrates)				
<i>H. amphibiarum</i>	134-155 x 52-65	freshwater, attached to amphibians (Anura: ranid (European common frog))	epizoic	Russia
<i>H. ampliurae</i> (syn. <i>Vorticella</i>)	25-40	marine, attached to brittle star (Echinodermata: ampliurid (<i>Amphiura squamata</i>))	epizoic	Eurasia
<i>H. brehmi</i>	80 x 70	freshwater, attached to caddisfly larvae (Trichoptera: glossosomatid (<i>Agapetus</i>))	epizoic (gills)	Europe?
<i>H. carinogammarii</i> (syn. <i>Vorticella</i>)	45-75 x 38-46	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Gammarus fossarum</i> , <i>roeselii</i> , <i>Carcinogammarus</i> ,	epizoic	Europe

		<i>Rivulogammarus</i>		
<i>H. ceriodaphniae</i>		freshwater, attached to invertebrates (Branchiopoda: daphniid (<i>Daphnia pulex</i> , <i>Ceriodaphnia reticulata</i> , <i>rotunda</i>); Copepoda: cyclopid (<i>Cyclops</i>))	epizoic	Russia
<i>H. chydoridae</i>		freshwater, attached to invertebrates (Branchiopoda: chydorid (<i>Chydorus sphaericus</i>))	epizoic	Russia
<i>H. claudicans</i> (syn. <i>Vorticella</i>)	40-55 x 30	freshwater, attached to mosses	epiphytic	Europe?
<i>H. conosomus</i> (syn. <i>Vorticella conosoma</i> , <i>Pyxidium</i> , <i>Propyxidium</i>)	75 x 30	freshwater, attached inert substrates and invertebrates (Rotifera: conochilid (<i>Conochilus unicornis</i> , <i>volvox</i>))	free-living, epizoic	North America
<i>H. contrahens</i>		freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus fossarum</i> , <i>pulex</i> , <i>roeselii</i>))	epizoic	Europe
<i>H. crassicaulis</i> (syn. <i>Vorticella</i> , <i>Paravorticella</i>)	45-90 x 16-25	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>))	epizoic	Eurasia
<i>H. dipneumon</i> (syn. <i>Vorticella</i>)	50-56 x 25	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus pulex</i>))	epizoic	Europe
<i>H. distinguendus</i> (syn. <i>H. hengsti</i>)	60-79 x 34-49	freshwater, attached to inanimate substrates, river weed (<i>Enteromorpha intestinalis</i>) and invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Gammarus pulex</i> , <i>tigrinus</i>))	free-living, epiphytic, epizoic	Europe
<i>H. eforianus</i> (syn. <i>Vorticella</i>)	55-60 x 20	marine	free-living	Europe?
<i>H. elegans</i> (syn. <i>Intranstylum</i> , <i>Vorticella</i>)	42-84 x 35-40	freshwater or marine, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Copepoda: cyclopid (<i>Cyclops</i>); Amphipoda: gammarid (<i>Gammarus tigrinus</i>); Polychaeta: serpulid (<i>Spirorbis</i>))	epizoic	Eurasia
<i>H. epizoicus</i> (syn. <i>Vorticella</i>)	25-46 x 18-37	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus fossarum</i>); Copepoda: cyclopid (<i>Cyclops</i> , <i>Megacyclops viridis</i>); Branchiopoda: bosminid (<i>Bosmina longirostris</i>), daphniid (<i>Scapholeberis</i>))	epizoic	Europe
<i>H. extensa</i> (syn. <i>Vorticella</i>)	50-100 x 15-27	freshwater, attached to inert substrates, and river weed (<i>Enteromorpha intestinalis</i>)	free-living, epiphytic	Europe
<i>H. fluviatilis</i>	28-48 x 14-30	freshwater, attached to invertebrates (Ostracoda: cypridid (<i>Heterocypris</i>))	epizoic	Europe?
<i>H. furcellariae</i> [type species]	98x40	marine, attached to seaweed (<i>Furcellaria</i>)	epiphytic	Europe?
<i>H. fusca</i> (syn. <i>Vorticella</i>)	88-110 x 55-75	marine, attached to inanimate substrates and algae (<i>Enteromorpha</i> sea lettuce)	free-living, epiphytic	Eurasia
<i>H. fusiformis</i> (syn. <i>Vorticella</i>)	140-162 x 60	freshwater, attached to amphibians (Anura (unspecified tadpoles))	epizoic (tails)	Europe?
<i>H. kahlii</i> (syn. <i>Vorticella</i>)	32-44 x 24-36	freshwater, attached to invertebrates (Branchiopoda: daphniid (<i>Daphnia galeata</i> , <i>longispina</i> , <i>hyalina</i>), leptodorida (<i>Leptodora kindtii</i> , <i>hyalina</i>), sidid (<i>Sida crystallina</i>); Amphipoda: gammarid (<i>Gammarus tigrinus</i>); Copepoda: cyclopid (<i>Macrocyclus albidus</i> , <i>Megacyclops viridis</i>))	epizoic	Europe
<i>H. leanderi</i>	30-32 x 22-24	marine, attached to invertebrates (Decapoda: palaemonid (<i>Leander</i>))	epizoic	Europe

<i>H. lentus</i>		freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus pulex</i>))	epizoic	Russia
<i>H. longinuclei</i>	43-61 x 41-49	freshwater, attached to amphibians (Anura: ranid (European common frog, tadpoles))	epizoic (tails)	Europe
<i>H. macronucleatus</i> (syn. <i>Vorticella</i>)	92 x 35	freshwater, attached to mayfly larvae (Ephemeroptera: ephemerid (<i>Ephemera vulgata</i>))	epizoic	Europe
<i>H. pelagicus</i> (syn. <i>Vorticella</i> , <i>Peudovorticella</i>)	30-40 x 50	marine	free-living	Europe
<i>H. procerus</i> (syn. <i>Vorticella</i>)	78-103 x 37-41	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus roeselii</i>), and amphibians (Anura (unspecified tadpoles))	epizoic	Europe
<i>H. ranae</i> (syn. <i>Intranstylum</i> , <i>Monintranstylum</i>)	65-90 x 35-50	freshwater, attached to amphibians (Anura (unspecified tadpoles))	tail fins	Europe
<i>H. rhabdostyloides</i> (syn. <i>Vorticella</i>)		freshwater, attached to invertebrates (Copepoda: cyclopid (<i>Acanthocyclops</i>))	epizoic	Russia
<i>H. rotundus</i> (syn. <i>Monintranstylum</i>)		freshwater, attached to invertebrates (Branchiopoda: daphniid (<i>Daphnia longispina</i>))	epizoic	Europe
<i>H. sertulariarum</i> (syn. <i>Spastostyla</i> , <i>Vorticella</i>)	60-109 x 34-48	marine and freshwater, attached to invertebrates (Echinozoa (unspecified sea urchins), Cnidaria (unspecified polyps); Decapoda: cambarid (<i>Cambarellus zempoalensis</i>); Copepoda: cyclopid (<i>Eucyclops serrulatus</i>); Hydrozoa: aglaopheniid (<i>Aglaophenia</i>)) and amphibians (Anura: ranid (European common frog, tadpoles))	epizoic	Mexico, Russia
<i>H. sommeri</i> (syn. <i>Monintranstylum</i>)		freshwater, attached to invertebrates (Copepoda: cyclopid (<i>Eucyclops serrulatus</i>); Ostracoda: cypridid (<i>Cypris</i>))	epizoic	Europe
<i>H. stammeri</i> (syn. <i>Monintranstylum</i>)		freshwater, attached to invertebrates (Branchiopoda: daphniid (<i>Daphnia pulex</i> , <i>Ceriodaphnia quadrangulata</i>), polyphemid (<i>Polyphemus pediculus</i>); Copepoda: cyclopid (<i>Cyclops</i> , <i>Eucyclops serrulatus</i>); Ostracoda: cypridid (<i>Cypris</i>))	epizoic	Europe
<i>H. stilleri</i>	60 x 27	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus fossarum</i> , <i>pulex</i>))	epizoic	Europe
<i>H. terrenus</i>	40-60 x 20-26	terrestrial (alpine soils)	free-living	Europe
<i>H. walteri</i>	55-75 x 40-60	freshwater (activated sludge)	free-living	Europe?
Genus Mesothamnium (zooids without dimorphism (form microzooids only), symbionts of crustaceans)				
<i>M. hiketes</i> (syn. <i>Zoothamnium</i>) [type species as <i>Zoothamnium</i>]	60-85 x 30-40	estuarine, attached to inanimate substrates and invertebrates (Amphipoda: gammarid (<i>Gammarus duebeni</i> , <i>locusta</i> , <i>oceanicus</i> , <i>salinus</i> , <i>zaddachi</i>); Isopoda: janirid (<i>Jaera albifrons</i>))	free-living, epizoic	Baltic Sea, China Sea
Genus: Myoschiston (prominent stalk, colonial, continuous straight myoneme does not continue down main trunk of colony, only upper colony contractile in zig-zag fashion, stalk without lorica-like extension)				
<i>M. balanorum</i> (syn. <i>Epistylis</i>)	100	marine, attached to barnacles (Cirripedia: balanid (<i>Amphibalanus improvisus</i> , <i>Balanus balanoides</i>))	epizoic	Atlantic, Baltic Sea
<i>M. carcini</i> (syn. <i>Epistylis</i>)		marine, attached to crabs (Decapoda: carcinid (<i>Carcinus maenas</i>))	epizoic	Europe, Baltic Sea
<i>M. centropagidarum</i>		marine, attached to invertebrates (Copepoda: acartiid (<i>Acartia tonsa</i>), centropagid (<i>Centropages hamatus</i>),	epizoic	Baltic Sea

		temorid (<i>Eurytemora affinis</i>)		
<i>M. cypridicola</i> (syn. <i>Epistylis</i>)	50-60 x 20-25	marine and brackish water, attached to invertebrates (Ostracoda: cyprid (<i>Cyprideis littoralis</i>); Gastropoda: hydrobiid (<i>Hydrobia ulvae, jenkinsi</i>))	epizoic	Europe, Baltic Sea
<i>M. duplicatum</i> [type species]	42-79 x 34-52	marine, attached to invertebrates (Decapoda: carcinid (<i>Carcinus maenas</i>), varunid (<i>Hemigrapsus</i>); Isopoda: odoteid (<i>Idotea balthica, tricuspidata, chelipes, viridis</i>))	epizoic	Baltic Sea, Black Sea, Korea
<i>M. neomysidis</i>		marine, attached to invertebrates (Mysida: mysid (<i>Neomysis integer, vulgaris</i>))	epizoic	Baltic Sea
<i>M. simile</i>	30-67 x 17-33	marine, attached to invertebrates (Decapoda: penaeid (<i>Penaeus orientalis</i>))	epizoic	Yellow Sea
Genus <i>Pseudohaplocaulus</i> (solitary zooids, prominent stalks, unbranched, straight myonemes, contracts in zig-zag fashion, reticulate silverline system)				
<i>P. anabaenae</i> (syn. <i>Vorticella, Haplocaulus</i>)	40-45 x 40	freshwater, attached to cyanobacterium (<i>Anabaena</i>)	epiphytic	North America
<i>P. infravacuolatus</i>	47-67 x 32-42	free-living (epiplanktonic), attached to cyanobacterium (<i>Anabaena</i>)		Europe
<i>P. nicoleae</i> [type species as <i>Haplocaulus</i>]	35-40 x 25	marine, attached to worm (Polychaeta: terebellid (<i>Nicolea zostericola</i>))	epizoic	Europe?
Genus <i>Zoothamnioides</i> (prominent stalk, branched, colonial, continuous myonemes, zooids with double peristomial lip, telotrochs with eccentric scopula)				
<i>Z. femoralis</i>	59-83 x 29-45	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Dikerogammarus villosus</i>))	epizoic	Europe
Genus <i>Zoothamnium</i> (prominent stalk, unbranched bearing single zooids or branched bearing small colonies, continuous straight myoneme permeating entire colony, contracts in zig-zag fashion, dimorphic zooids (micro- and macro-zooids), peristome with lip, transverse silverline system)				
<i>Z. adamsi</i>	60	freshwater and marine, attached to plants (<i>Cladophora</i>)	epiphytic	North America, Europe
<i>Z. affine</i>	30-100 x 24-45	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Dikerogrammarus villosus, Echinogrammarus trichiatus, Gammarus fossarum, pulex, roeselii, tigrinus</i>); Decapoda: penaeid (<i>Penaeus chinensis/orientalis</i>) and insect larvae)	epizoic	Eurasia
<i>Z. alrasheidi</i>	dimorphic, 80-120 x 50-60, micro-zooids 60-70 x 30-40	marine	free-living	China
<i>Z. alternans</i> (sometimes misspelt as <i>alterans</i>) (syn. <i>Z. chlamydis</i>)	dimorphic, micro-zooids 40-56 x 25-35; macro-zooids 70-90 x 45-55	marine, attached to inanimate substrates, algae, plants (<i>Ruppia</i>) and invertebrates (Copepoda: acartiid (<i>Acartia tonsa</i>); Isopoda: sphaeromatid (<i>Sphaeroma serratum</i>), and scallops (Bivalvia: pectinid (<i>Chlamys farreri</i>))	free-living, epiphytic, epizoic	Eurasia, North America
<i>Z. apoarbuscula</i>	25-50 x 20-30	marine	free-living	China
<i>Z. apohentscheli</i>	40-65 x 25-40	marine	free-living	China
<i>Z. arbuscula</i> (syn. <i>Vorticella, Z. geniculatum</i>)	dimorphic 225 x 180, micro-zooids 40-80 x 30-65	freshwater attached to inanimate substrates, detritus, plants (<i>Elodea, Nymphaea</i>) and invertebrates (Decapoda: cambarid (<i>Cambarellus montezumae, zempoalensis</i>); Copepoda: cyclopid (<i>Cyclops</i>), diaptomid (<i>Diaptomus</i>); Isopoda: janirid (<i>Jaera sarsi</i>))	free-living, epiphytic, epizoic	cosmopolitan
<i>Z. arcuatum</i>	63-95 x 32-56	brackish water, attached to algae	epiphytic	China
<i>Z. aselli</i>	65-125 x 35-50	freshwater, attached to invertebrates	epizoic	Eurasia

		(Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Gammarus fossarum, pulex</i>), niphargid (<i>Niphargus puteanus</i>))		
<i>Z. asellicola</i>		freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>))	epizoic	Europe
<i>Z. astacicolae</i>		freshwater, attached to invertebrates (Decapoda: astacid (<i>Pontastacus leptodactylus</i>))	epizoic	Europe
<i>Z. balticum</i>		marine	free-living	Baltic Sea
<i>Z. belliformum</i>		freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Gammarus roeselii</i>))	epizoic	Europe
<i>Z. bucciniiformum</i>	40-55 x 40-50	marine, attached to inert substrates	free-living	China
<i>Z. candelabrum</i>	60	marine	free-living	Pacific
<i>Z. carcini</i>		marine and freshwater, attached to invertebrates (Decapoda: carcinid (<i>Carcinus maenas</i>))	epizoic	Europe
<i>Z. carinogammari</i>	29-54 x 20-25	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Dikerogrammarus haemobaphes, villosus, Gammarus fossarum, pulex, roeselii, tigrinus</i>))	epizoic	Europe
<i>Z. caulodes</i>		freshwater	free-living	Europe
<i>Z. charae</i>		freshwater, attached to plants (<i>Chara</i>)	epiphytic	Europe
<i>Z. cienkowskii</i>	35-50	marine	free-living	Europe
<i>Z. commune</i>	60-104 x 48-56	marine	free-living	China
<i>Z. conchulaecola</i>		freshwater, attached to inanimate substrates and invertebrates (Gastropoda: planorbis (<i>Planorbis rotundatus</i>))	free-living, epizoic	Europe
<i>Z. congermanum</i>		freshwater	free-living	Europe
<i>Z. congerminale</i>		freshwater	free-living	Europe
<i>Z. constrictum</i>		freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus fossarum, roeselii, Carinogammarus triacanthus</i>))	epizoic	Europe
<i>Z. corymbiformis</i>	20-25	freshwater	free-living	Europe
<i>Z. cupiferum</i> (syn. <i>Z. cupiformum</i>)	82-105 x 44-63	marine, attached to invertebrates (Decapoda: penaeid (<i>Penaeus orientalis</i>))	epizoic	Yellow Sea
<i>Z. dichotomum</i>	50-65 x 20-35	freshwater, attached to inanimate substrates and invertebrates (Decapoda: cambarid (<i>Cambarellus patzcuarensis</i>))	free-living, epizoic	Europe, Mexico
<i>Z. dudekemi</i> (syn. <i>Z. parasitica</i>)	61-90	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Gammarus fossarum, pulex, roeselii, Carinogrammus</i>))	epizoic	Europe
<i>Z. duplicatum</i>	60-85 x 35-45	marine, attached to inanimate substrates, invertebrates (Decapoda: carcinid (<i>Carcinus maenas</i>), majid (<i>Maja squinado</i>), penaeid (<i>Penaeus chinensis/orientalis</i>); Amphipoda: gammarid (<i>Gammarus locusta, oceanicus, pulex</i>); Isopoda: idoteid (<i>Idotea chelipes/viridis</i>), janirid (<i>Jaera albifrons/marina</i>), sphaeromaris (<i>Lekanesphaera rugicauda</i>) and fish (Scorpaeniformes: cottid (shorthorn sculpin); Syngnathiformes: syngnathid (straightnose pipefish))	free-living, epizoic	cosmopolitan
<i>Z. elegans</i>	80	fresh and brackish water	free-living	Europe

<i>Z. elegantissimum</i>	35-37	freshwater, attached to inanimate substrates and invertebrates (Gastropoda: planorbid (<i>Planorbis rotundatus</i>))	free-living, epizoic	Europe
<i>Z. fasciculare</i>		freshwater	free-living	Europe
<i>Z. florens</i>	85-110 x 45-60	marine (mangrove)	free-living	China
<i>Z. foissneri</i>	70-110 x 30-42	marine	free-living	China
<i>Z. gajewskajum</i> (syn. <i>Vorticella constricta</i>)	11	freshwater	free-living	Europe
<i>Z. gammari</i>	60-100 x 30-50	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus fossarum, pulex, roeselii, Dikerogrammus villosus</i>))	epizoic	Eurasia
<i>Z. gemmans</i>		freshwater	free-living	Europe
<i>Z. glesnicum</i>	100	marine	free-living	Europe
<i>Z. grossi</i>	45-60 x 35-40	brackish water, attached to algae	epiphytic	China
<i>Z. haplocaulis</i>	38-50	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Gammarus roeselii</i>))	epizoic	Europe
<i>Z. hartwigi</i>	75-90 x 40-50	marine	free-living	China
<i>Z. helicaecola</i>		freshwater	free-living	Europe
<i>Z. hiketes</i>	60-80 x 30-40	marine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus locusta, oceanicus, zaddachi, salinus, tigrinus</i>))	epizoic	Eurasia
<i>Z. hyalinum</i> (syn. <i>Vorticella</i>)	45-70 x 25-40	estuarine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus fossarum, pulex, roeselii</i>))	epizoic	Europe
<i>Z. hydrobiae</i>	70	brackish water, attached to invertebrates (Gastropoda: hydrobiid (<i>Hydrobia</i>))	epizoic	Europe
<i>Z. ignavum</i>	trimorphic: microzooids 39 x 29; terminal zooids 52 x 23; macrozooids 35-86	marine	free-living	Mediterranean
<i>Z. infundubulum</i>		freshwater	free-living	Europe
<i>Z. intermedium</i>	35-52 x 27-37	marine, attached to inert substrates and invertebrates (Copepoda: acartiid (<i>Acartia clausi, tonsa, Paracartia latisetosa</i>), pseudodiaptomid (<i>Calanipeda aquadulcis</i>); Decapoda: atyid (<i>Caridina lanceolata</i>), crangonid (<i>Crangon crangon</i>), hippolytid (<i>Hippolyte leptocerus/longirostris</i>), palaemonid (<i>Palaemon adspersus</i>), penaeid (<i>Penaeus chinensis/orientalis</i>), temorid (<i>Eurytemora affinis</i>); Amphipoda: aorid (<i>Microdeutopus gryllotalpa</i>))	free-living, epizoic	Eurasia, North America
<i>Z. kahli</i>		freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus pulex, roeselii, Carinogrammarus</i>))	epizoic	Europe
<i>Z. kentii</i> (syn. <i>Z. hentscheli</i>)	50-90 x 30-45	freshwater and marine, attached to inanimate substrates, detritus, and plants	free-living, epiphytic	Eurasia
<i>Z. laomedae</i>		marine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus insensibilis</i>))	epizoic (legs)	Eurasia
<i>Z. latipedia</i>		freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>))	epizoic	Europe
<i>Z. latipes</i>		freshwater, attached to plants (<i>Callitriche</i>)	epiphytic	Europe
<i>Z. limpidum</i>	83	freshwater	free-living	Eurasia

<i>Z. longifilum</i>		aquatic, attached to invertebrates (Amphipoda: corophiid (<i>Chelicorophium curvispinum</i>), gammarid (<i>Gammarus fossarum/pulex</i>))	epizoic	Europe
<i>Z. marinum</i>	95-110 x 50-60	marine, attached to algae (seaweed) and unspecified 'zoophytes' (presumably Cnidaria)	epiphytic, epizoic	Europe
<i>Z. maximum</i>	80-121 x 45-65	marine, attached to inanimate substrates and invertebrates (Decapoda: penaeid (<i>Penaeus orientalis</i>))	free-living, epizoic	Yellow Sea
<i>Z. microdiscum</i>		freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus fossarum</i>); Isopoda: asellid (<i>Asellus aquaticus</i>))	epizoic	Europe
<i>Z. minimum</i>		aquatic, attached to invertebrates (Amphipoda: corophiid (<i>Chelicorophium curvispinum</i>), gammarid (<i>Gammarus roeselii, tigrinus</i>))	epizoic	Europe
<i>Z. mucedo</i>	50-90 x 30-50	marine, attached to plants and invertebrates (Amphipoda: gammarid (<i>Gammarus pulex, tigrinus</i>))	free-living, epiphytic, epizoic	Europe
<i>Z. mysidae</i>		freshwater, attached to invertebrates (Mysida: mysid (<i>Limnomysis benedeni, Paramysis lacustris</i>))	epizoic	Europe
<i>Z. nanum</i>	30-35	marine, attached to algae (seaweed) and invertebrates (Amphipoda: aorid (<i>Microdeutopus gryllotalpa</i>), gammarid (<i>Gammarus duebeni, locusta, oceanicus, salinus, zaddachi</i>); Isopoda: idotheid (<i>Idothea baltica</i>), janirid (<i>Jaera albifrons</i>))	free-living, epiphytic, epizoic	Baltic Sea, Black Sea
<i>Z. nii</i>	70-80 x 40-50	marine	free-living	China
<i>Z. niveum</i> (syn. <i>Z. plumosum, spirale</i>)	bimorphic: micro-zooids 60 x 19; macro-zooids 20-150	freshwater; attached to submerged plants (<i>Adiantum</i> fronds)	epiphytic	Europe
<i>Z. nutans</i>		marine, attached to algae	epiphytic	Europe
<i>Z. ovifera</i> [type species as <i>Vorticella</i>]		marine	free-living	Europe
<i>Z. oviforme</i>	64-84 x 30-44	freshwater, attached to plants (<i>Potamogeton</i>) and invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Gammarus tigrinus</i>))	epiphytic, epizoic	Europe
<i>Z. palmplatum</i>	71-86 x 41-50	estuarine, attached to green algae (<i>Ulva</i>)	epiphytic	China
<i>Z. paraentzii</i>	50-80 x 25-45	marine, attached to inanimate substrates and invertebrates (Decapoda: penaeid (<i>Penaeus chinensis/orientalis</i>))	free-living, epizoic	Yellow Sea
<i>Z. paragammari</i>	36-60 x 21-35	marine, attached to invertebrates (Decapoda: penaeid (<i>Penaeus chinensis/orientalis</i>))	epizoic	Yellow Sea
<i>Z. parahentschli</i>	50-75 x 30-52	marine and brackish water, attached to algae	free-living, epiphytic	China
<i>Z. parahiketes</i>	60-75 x 15-30	marine	free-living	China
<i>Z. pararbuscula</i>	35-65 x 30-40	marine	free-living	China
<i>Z. parasiticum</i>	70	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Dikerogrammus haemobaphes, Gammarus balcanicus, fossarum, komareki, pulex, tigrinus</i>); Copepoda: cyclopid (<i>Cyclops strenuus, Macrocyclus albidus, fuscus</i>), diaptomid	epizoic	Europe

		(<i>Eudiaptomus vulgaris</i>): Branchiopoda: daphniid (<i>Daphnia longispina</i>))		
<i>Z. pelagicum</i>		marine (pelagic)	free-living	Europe
<i>Z. penaei</i>	54-95 x 38-62	marine, attached to invertebrates (Decapoda: penaeid (<i>Penaeus aztecus</i> , <i>brasiliensis</i> , <i>chinensis</i> , <i>duorarum</i> , <i>vannamei</i>), palaemonid (<i>Palaemon pugio</i>))	epizoic	Mexico, Yellow Sea
<i>Z. perejaslawzewae</i>	67-74 x 40-47	marine, attached to invertebrates (Decapoda: penaeid (<i>Penaeus chinensis/orientalis</i>); Isopoda: sphaeromatid (<i>Sphaeroma serratum</i>), Tunicata: ascidiid (<i>Phallusia</i>))	epizoic	Black Sea, Yellow Sea
<i>Z. perlatum</i>		freshwater	free-living	Europe
<i>Z. pictum</i>	16	freshwater	free-living	Europe
<i>Z. plectostylum</i>		freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>))	epizoic	Europe
<i>Z. plicatum</i>		marine	free-living	Europe
<i>Z. plumosum</i>		freshwater and marine	free-living	Eurasia
<i>Z. plumula</i>	50-75 x 30-45	marine, attached to inanimate substrates and invertebrates (Decapoda: pagurid (<i>Pagurus bernhardus</i>))	free-living, epizoic	Eurasia
<i>Z. ponticum</i>	50	freshwater, attached to inanimate substrates and invertebrates (Amphipoda: gammarid (<i>Gammarus insensibilis</i>); Decapoda: cambarid (<i>Cambarellus zemopoalensis</i>))	free-living, epizoic	Black Sea, Mexico
<i>Z. procerissimum</i>		marine, attached to invertebrates (Hydrozoa: cordylophorid (<i>Cordylophora</i>))	epizoic	Europe
<i>Z. procerius</i>	60-80 x 27-46	freshwater attached to inanimate substrates, detritus, plants (algae) and invertebrate animals (molluscs, arthropods, Decapoda: astacid (<i>Astacus astacus/fluviatilis</i>); Amphipoda: gammarid (<i>Gammarus pulex</i> , <i>roeselii</i>))	free-living, epiphytic, epizoic	Europe
<i>Z. prosperinae</i>		aquatic	free-living	Europe
<i>Z. pygmaeum</i> (syn. <i>Carchesium</i> , <i>Vorticella</i>)	10-80	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus</i>))	epizoic	Eurasia
<i>Z. ramosissimum</i>	54-88 x 29-50	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Dikerogrammus vilosus</i> , <i>Echinogrammus ischnus</i> , <i>trichiatus</i> , <i>Gammarus pulex</i>))	epizoic	Europe
<i>Z. rigidum</i>		marine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus locusta</i> , <i>oceanicus</i> , <i>pulex</i>); Isopoda: sphaeromid (<i>Sphaeroma annandelei</i> , <i>terebrans</i>); Decapoda: penaeid (<i>Metapenaeus monoceros</i>); Tanaidacea: parapseudid (<i>Ctenapseudes chilkensis</i>))	epizoic	Europe, India, Baltic Sea
<i>Z. robustum</i>	56-86 x 27-36	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus fossarum</i> , <i>pulex</i> , <i>roeselii</i>))	epizoic	Europe
<i>Z. sevastopoli</i>		marine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus olivii</i> , <i>insensibilis</i>))	epizoic (appendages)	Black Sea
<i>Z. simplex</i>	64-80 x 29-34	freshwater, attached to plants and invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Gammarus tigrinus</i>); Decapoda: cambarid (<i>Cambarellus patzcuarensis</i>))	free-living, epiphytic, epizoic	Europe, Mexico
<i>Z. sinense</i>	3-59 x 30-64	marine and brackish water, attached to	free-living,	North Sea,

(syn. <i>Z. commune</i> p.p., <i>truncatum</i>)		inanimate substrates and invertebrates (Decapoda: penaeid (<i>Penaeus orientalis</i>); Hydrozoa: cordylophorid (<i>Cordylophora</i>))	epizoic	Yellow Sea
<i>Z. sphaeroma</i>		marine, attached to invertebrates (Isopoda: sphaeromatid (<i>Sphaeroma serratum</i>))	epizoic (gills)	Black Sea
<i>Z. steuerei</i>		marine, attached to invertebrates (Copepoda: metridinid (<i>Pleuromamma gracilis</i>))	epizoic	Europe
<i>Z. thiophilum</i>		marine, attached to invertebrates (Decapoda: penaeid (<i>Penaeus chinensis/orientalis</i>))	epizoic	Yellow Sea
<i>Z. timidum</i>		freshwater	free-living	Europe
<i>Z. varians</i>	54-60 x 38-42	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Dikerogammarus haemobaphes</i> , <i>Gammarus fossarum</i> , <i>roeselii</i> , <i>tigrinus</i> , <i>Carinogammarus</i>))	epizoic	Eurasia
<i>Z. vermicola</i>	55-100 x 40-50	marine, attached to inanimate substrates and invertebrates (Bivalvia: hyriid (<i>Castalia punctata</i>); Polychaeta: phyllodocid (<i>Eteone longa</i>); Annelida: nephtyid (<i>Nephtys</i>), pectinariid (<i>Lagis koreni</i>); Echinodermata: ophiurid (<i>Ophiura albida</i>))	free-living, epizoic	China
<i>Z. wangi</i>	65-90 x 45-55	marine	free-living	China
<i>Z. weishanicum</i>	55-90 x 30-45	freshwater	free-living	China
<i>Z. wilberti</i>	45-65 x 30-40	marine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus</i>))	epizoic	China
<i>Z. xuianum</i>	30-50 x 25-30	marine	free-living	China
<i>Z. zhanjiangense</i>	80-100 x 45-55	brackish water (mangrove)	free-living	China
Genus: <i>Zoothamnopsis</i> (prominent stalk, branched bearing small colonies, continuous straight myoneme permeates whole colony, all zooids contract in zig-zag fashion at same time, peristome with lip, with reticulate silverline system)				
<i>Z. liui</i>	65-80 x 35-50	marine	free-living	China
<i>Z. mengi</i> [type species]	50-75 x 20-45	marine	free-living	China
<i>Z. perlata</i>		freshwater	free-living	Europe
<i>Z. sinica</i>	70-105 x 40-55	marine	free-living	China
<i>Z. stillerae</i> (syn. <i>Zoothamnium</i>)		freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus roeselii</i>))	epizoic	Europe

Loricata sessiline peritrichs belong to 2 main families:

- The family Vaginicolidae contains species whose zooids have trumpet-shaped bodies housed in pseudochitinous lorica which are often erect (upright), but are sometimes flattened. The lorica are either attached directly to substrates by their bases or they may have short attachment stalks. The lorica apertures may remain open permanently or may be closed by unique valves (opercula) attached to zooids or to loricae. The family contains 9 genera: *Australana*, *Cothurnia* (syn. *Daurotheca*, *Dimorphocothurnia*, *Pachytrocha* p.p., *Planicola*, *Semicothurnia*, *Sincothurnia*, *Stylocola*, *Tesnotheca*, *Thuricolopsis*, *Tubularia* p.p.), *Cothurniopsis* (syn. *Pseudothuricola*), *Cothurnopsis*, *Platycola*, *Pyxicola* (syn. *Caulicola*, *Pachtrocha* p.p.), *Thuricola*, *Triacola*, and *Vaginicola* (syn. *Miculopodium*).
- In contrast, the family Lagenophryidae contains species whose zooids have rounded bodies housed in pseudochitinous lorica which are often flattened (discoidal), but sometimes upright. The lorica lack attachment stalks and their apertures may be closed by complex devices involving opposing lips and contractile filaments. The family contains 6 genera: *Chilenophrys*, *Clistolagenophrys*, *Lagenophrys* (syn. *Circolagenophrys*, *Stylohedra*), *Operculigera*, *Paralagenophrys*, and *Setonophrys*. Many loricata peritrichs occur as epizoic or ectocommensals on the external surfaces of crustacean hosts, often exhibiting high host specificity and tissue tropism, with infestations restricted to certain locations on particular hosts. Heavy infestations of the carapace and gills may cause unsightly fouling and even respiratory problems for their hosts, thus contributing to economic losses in aquaculture industries.

LORICATE PERITRICHS				
Species	Lorica size (µm)	Habitat/Hosts	Life-style [disease]	Distribution
Family: Vaginicolidae				
Genus Australana (round discoid lorica, vaulted apical surface with central elliptical aperture, attached to substrate over rounded basal surface)				
<i>A. kaneis</i>	46-50 x 11-12	freshwater, attached to Decapoda: parastacid (<i>Euastacus australiensis</i>)	epizoic	Australia
Genus Cothurnia (upright erect lorica, vase- to urn-shaped with narrower aperture, with short stalk, open aperture, zooid attached to base of lorica without series of membranes, marine/freshwater)				
<i>C. ahtiari</i>		marine, attached to invertebrates (Isopoda: sphaeromatid (<i>Sphaeroma serratum</i> , <i>Nassa bidentata</i>))	epizoic (legs)	Black Sea
<i>C. acuta</i> (syn. <i>Semicothurnis</i>)	50-56 x 30	marine, brackish water, attached to inanimate substrates and invertebrates (Polychaeta: polynoid (<i>Harmothoe sarsi</i> , <i>imbricata</i>))	free-living, epizoic	Europe
<i>C. affinis</i>	65	freshwater, attached to invertebrates (Copepoda: canthocamptid (<i>Canthocamptus</i>))	epizoic	Eurasia
<i>C. amoyensis</i>	35-40 x 18-20	marine, attached to algae	epiphytic	Atlantic
<i>C. amphiteis</i> (syn. <i>Semicothurnia</i>)	53-56 x 35	marine, attached to worms (Polychaeta: ampharetid (<i>Amphiteis gunneri</i>))	free-living, epizoic (setae)	Europe
<i>C. angusta</i>	60 x 15-23	fresh or brackish water, attached to inanimate substrates, sea lettuce (<i>Enteromorpha intestinalis</i>) and invertebrates (Ostracoda: cypridid (unspecified))	free-living, epiphytic, epizoic	Europe
<i>C. annulata</i> (syn. <i>Cothurniopsis</i>)	40-85 x 11-25	freshwater, attached to filamentous algae (<i>Bulbochaeta</i> , <i>Hydrodictyon reticulatum</i> , <i>Melosira</i> , <i>Mougeoutia</i> , <i>Spirogyra</i>) and submerged plants (<i>Enteromorpha intestinalis</i> , <i>Myriophyllum</i> , <i>Lemna</i>)	free-living, epiphytic	Eurasia, America
<i>C. anomala</i>	30-40 x 15-25	freshwater, attached to invertebrates (Amphipoda: corophiid (<i>Corophium curvispinum</i>))	epizoic	Europe
<i>C. antarctica</i> (syn. <i>Cothurniopsis</i>)	50-60 x 30	marine, attached to invertebrates (Ostracoda: philomedid (<i>Philomedes laevipes</i>))	epizoic	Antarctica
<i>C. aplatita</i>	45-65 x 25-30	marine, attached to green algae and plants (Campanulariaceae)	free-living, epiphytic	Europe
<i>C. apseudophila</i> (syn. <i>Sinocothurnia</i>)	88-92 x 29-31	marine, attached to invertebrates (Malacostraca: apseudid (<i>Apseudes spinosus</i>))	epizoic	Europe
<i>C. arcuata</i> (syn. <i>C. arenata</i> , <i>fusiformis</i>)	125 x 60-65	marine	free-living	Eurasia
<i>C. astaci</i>	90	freshwater, attached to invertebrates (Decapoda: astacid (<i>Astacus astacus</i> , <i>leptodactylus</i>) and unspecified 'entomostraca')	epizoic (appendages, gills)	Europe
<i>C. asymmetrica</i> (syn. <i>C. asimmetrica</i>)	48-52 x 25	freshwater, attached to filamentous green algae (<i>Cladophora</i>) and plants (<i>Enteromorpha intestinalis</i>)	epiphytic	Europe
<i>C. auriculata</i> (syn. <i>Sinocothurnia</i> , <i>S. flexa</i> p.p.)	110-150 x 45-60	marine, attached to inanimate substrates and filamentous green algae (<i>Cladophora</i>)	free-living, epiphytic	Europe, North America
<i>C. beciformis</i> (syn. <i>Planicola</i>)	70	freshwater	free-living	Europe
<i>C. boeckii</i>		freshwater	free-living	Europe
<i>C. borealis</i>		marine (planktonic)	free-living	Europe

(syn. <i>Tintinnus</i> , <i>Amphorides</i>)				
<i>C. branchiata</i> (syn. <i>Sinocoithurnia</i>)	87-112 x 35-45	freshwater, attached to crayfish (Decapoda: astacid (<i>Astacus leptodactylus</i>))	epizoic (gills, epipodites)	Ukraine
<i>C. brevistyla</i>	43-55 x 20-25	freshwater, attached to algae	epiphytic	Europe
<i>C. butschlii</i>	53 x 27	marine, attached to kinorhynchs (Cyclorhagida: echinoderid (unspecified mud dragon))	epizoic	Europe
<i>C. camura</i>		freshwater	free-living	Europe
<i>C. canthocampti</i> (syn. <i>Cothurniopsis</i>)	80-95 x 40-42	freshwater, attached to invertebrates (Copepoda: canthocamptid (<i>Canthocamptus minutus</i>))	epizoic	North America
<i>C. carinogammari</i>	70-72 x 40-42	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus</i>))	epizoic	Europe
<i>C. ceramicola</i>	60-130 x 20-45	marine, attached to inanimate substrates, algae (<i>Ceramium</i>) and invertebrates (Bryozoa: cribrilinid (<i>Cribrilina punctata</i>), crisiid (<i>Crisia eburnea</i>); Hydrozoa: campanulariid (<i>Laomedea loveni</i>); Polychaeta: serpulid (<i>Spirorbis spirorbis</i>))	free-living, epiphytic, epizoic	Eurasia
<i>C. cincta</i> (syn. <i>Planicola</i>)	50	freshwater, attached to inanimate substrates and plants (<i>Lemna</i>)	free-living, epiphytic	Europe
<i>C. clausiens</i>	35-50 x 20-35	freshwater, attached to unspecified arthropods	epizoic	Europe
<i>C. coarctata</i>	66-75 x 30	marine, attached to detritus and green algae	free-living, epiphytic	Europe
<i>C. cohni</i> (syn. <i>C. pupa p.p.</i>)	60 x 20	marine	free-living	North Sea
<i>C. collaris</i>	60-100 x 30-45	marine or brackish water, attached to algae	free-living	Europe
<i>C. complanata</i>	78-81 x 32-35	marine, attached to worms (Polychaeta: flabelligerid (<i>Stylarioides plumosus</i>))	epizoic	Europe
<i>C. compressa</i> (syn. <i>Sinocoithurnia</i> , <i>C. compressula</i> , <i>flexa p.p.</i>)	100-140 x 50	marine, attached to algae and invertebrates (Bryozoa (unspecified))	epiphytic, epizoic	Europe, North America
<i>C. cordylophorae</i>	120 x 35	brackish water, attached to invertebrates (Hydrozoa: cordylophorid (<i>Cordylophora caspia</i>))	epizoic	Europe
<i>C. corrugata</i>	127	marine, attached to thread-like green algae (Confervae)	epiphytic	Europe
<i>C. cracens</i> (syn. <i>Planicola</i>)		freshwater	free-living	Europe
<i>C. curvula</i>	60 x 30	marine, attached to invertebrates (Copepoda: harpacticid (unspecified))	epizoic	Europe
<i>C. cuspidata</i> (syn. <i>Stylocola</i>)	19	freshwater, attached to algae	epiphytic	Europe
<i>C. cyathiforme</i> (syn. <i>Sinocoithurnia</i>)	95-100 x 45	marine	free-living	Europe
<i>C. cyclopis</i>	60 x 25	marine, attached to invertebrates (Copepoda: harpacticid (unspecified))	epizoic	Europe
<i>C. cyclopsinae</i> (syn. <i>Planicola</i>)		freshwater, attached to invertebrates (Copepoda: cyclopid (<i>Cyclops</i>))	epizoic	Europe
<i>C. cylindrica</i>	61 x 29	freshwater, attached to plants (<i>Enteromorpha intestinalis</i>)	epiphytic	Europe
<i>C. cytherideae</i>	70 x 35	marine, attached to invertebrates (Ostracoda: cytherideid (<i>Cytheridea</i>); Hydrozoa (unspecified))	epizoic	Baltic Sea
<i>C. dauciformis</i> (syn. <i>Planicola</i>)		freshwater, attached to algae	epiphytic	Europe
<i>C. elastica</i>	50-70	freshwater, attached to moss	epiphytic	Europe

(syn. <i>Cothurniopsis</i>)				
<i>C. elongata</i> (syn. <i>Sinocothurnia</i>)	150 x 65	marine (aquaria)	free-living	Asia
<i>C. exilipes</i> (syn. <i>Stylocola</i>)	30	freshwater	free-living	Europe
<i>C. exilis</i> (syn. <i>Planicola</i>)		freshwater, attached to algae	free-living, epiphytic	Europe
<i>C. fecunda</i>	110 x 35	brackish water, attached to filamentous algae	free-living, epiphytic	North America
<i>C. felinska</i>	110 x 40	marine, attached to algae	epiphytic	Europe
<i>C. fibripes</i>	60 x 30	marine (aquaria), attached to detritus	free-living	Europe
<i>C. floscularia</i>	85 x 40	freshwater	free-living	Europe
<i>C. gammari</i> (syn. <i>Sinocothurnia</i>)	53-55 x 25-34	marine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus locusta</i> , <i>oceanicus</i> , <i>duebenii</i> , <i>insensibilis</i>))	epizoic	Europe
<i>C. gracilis</i> (syn. <i>Sinocothurnia</i>)	90-100	marine, attached to invertebrates (Leptostraca: nebaliid (<i>Nebalia bipes</i>))	epizoic	Europe, North America
<i>C. guyanensis</i>	76-120 x 59-73	marine, attached to tanaids (Peracarida: tanaidid (<i>Halmyrapseudes spaansi</i>))	epizoic	South America
<i>C. halacaricola</i>	70 x 23-35	marine, attached to mites (Trombidiformes: halacarid (<i>Copidognathus fabriciusi</i>))	epizoic	Eurasia
<i>C. harpactici</i>	75-88 x 28-35	marine, attached to invertebrates (Copepoda: canthocamptid (<i>Cletocamptus confluens</i> , <i>Mesochra lilljeborgi</i>))	epizoic	Europe
<i>C. havniensis</i>	85	marine	free-living	America
<i>C. imberbis</i> (syn. <i>Sinocothurnia</i> , <i>C. putanea</i>) [type species]	45-85 x 20-40	freshwater, attached to diatoms, plants (<i>Ruppia</i>) and invertebrates (Copepoda: cyclopid (<i>Cyclops</i>))	epizoic	Europe, North America
<i>C. inclinans</i>	57 x 40	marine, attached to algae	epiphytic	Europe
<i>C. inflata</i>	60 x 30	brackish water, attached to filamentous algae	free-living, epiphytic	North America
<i>C. inflecta</i>	70 x 35	marine, attached to green algae		Europe
<i>C. innata</i> (syn. <i>C. hofkeri</i>)	40-100 x 20-27	marine, attached to red algae and snails (Gastropoda: hydrobiid (<i>Hydrobia</i>))	epiphytic, epizoic	Europe
<i>C. irregularis</i>	55 x 35	freshwater	free-living	Europe
<i>C. kahli</i>	43-50 x 21-29	freshwater, attached to filamentous green algae (<i>Cladophora</i>)	epiphytic	Europe
<i>C. lapponum</i>	72-116 x 30-49	freshwater (marshes), attached to mosses (<i>Sphagnum</i>)	epiphytic	Eurasia
<i>C. lata</i>	50-70 x 40-45	marine or freshwater, attached to invertebrates (Copepoda: diaptomid (<i>Diaptomus</i>) and other 'entomostraca')	epizoic	North America
<i>C. limanica</i> (syn. <i>Sinocothurnia</i>)		freshwater, attached to crayfish (Decapoda: astacid (<i>Astacus leptodactylus</i>))	epizoic	Eurasia
<i>C. limnoriae</i> (syn. <i>Tesnotheca</i>)	70-90 x 33-40	marine, attached to invertebrates (Isopoda: limnoriid (<i>Limnoria lignorum</i>))	epizoic	Eurasia
<i>C. macrodisca</i>	75 x 40	freshwater, attached to green algae (<i>Spirogyra</i>)	epiphytic	Europe
<i>C. magna</i>	200 x 56	freshwater	free-living	China
<i>C. maritima</i> (syn. <i>C. cyathus</i> , <i>marina</i>)	35-56 x 28-33	estuarine, attached to inanimate substrates and green algae	free-living, epiphytic	Eurasia
<i>C. membranoloricata</i>	40-45 x 18-23	marine, attached to filamentous green algae (<i>Cladophora repens</i> , <i>heteronema</i> , <i>Spirogyra</i>)	epiphytic	Europe, Africa
<i>C. minutissima</i> (syn. <i>C. sinuata</i> , <i>Cothurniopsis</i>)	35-50 x 18-27	freshwater, attached to detritus, mosses and plants (<i>Enteromorpha intestinalis</i>)	free-living, epiphytic	Europe
<i>C. mobiusi</i>	50 x 30	marine	free-living	North Sea

(syn. <i>C. maritima</i> p.p.)				
<i>C. mollis</i> (syn. <i>Planicola</i>)		freshwater, attached to plants (<i>Lemna</i>)	epiphytic	Europe
<i>C. monoannulata</i> (syn. <i>Sinocothurnia</i>)	68 x 32	freshwater, attached to filamentous green algae (<i>Cladophora</i>)	epiphytic	Europe
<i>C. nana</i> (syn. <i>Planicola</i>)		freshwater	free-living	Europe
<i>C. nebaliae</i> (syn. <i>Dimorphocothurnia</i>)	100-120 x 40-55	marine, attached to invertebrates (Leptostraca: nebaliid (<i>Nebalia bipes</i>))	epizoic	Europe
<i>C. nereicola</i> (syn. <i>Sinocothurnia</i>)	33 x 30	marine, attached to worms (Polychaeta: nereidid (<i>Nereis diversicolor</i>))	epizoic	Europe
<i>C. nitocrae</i>	93-97 x 30-35	marine, attached to invertebrates (Copepoda: harpacticoid (<i>Nitocra spinipes</i>))	epizoic	Europe
<i>C. obliqua</i>	95-96 x 44-45	brackish water, attached to green algae (<i>Ceramium diapharum</i>)	epiphytic	Europe
<i>C. oblonga</i>	71-82 x 30-33	freshwater, attached to detritus, filamentous green algae (<i>Cladophora</i>) and plants (<i>Lemna</i> , <i>Enteromorpha intestinalis</i>)	free-living, epiphytic	Europe
<i>C. oliva</i> (syn. <i>Planicola</i>)	35	freshwater	free-living	Europe
<i>C. ovalis</i>	40 x 22	marine	free-living	North America
<i>C. ovata</i> (syn. <i>Cothurniopsis</i>)	125 x 75	freshwater, attached to algae (<i>Conferva</i>)	epiphytic	Europe
<i>C. oviformis</i>	48 x 22	freshwater, attached to filamentous green algae (<i>Cladophora</i>)	epiphytic	Europe
<i>C. parva</i> (syn. <i>Planicola</i>)	46-50 x 30-34	brackish water, attached to green algae (<i>Ceramium diaphanum</i>)	epiphytic	Eurasia
<i>C. parvula</i> (syn. <i>Sinocothurnia</i>)	50-62 x 24	marine, attached to algae	free-living	Europe
<i>C. patula</i>	55 x 45	freshwater, attached to algae	free-living	Europe
<i>C. pediculata</i>		freshwater, attached to algae	free-living, epiphytic	Europe
<i>C. peloscolicis</i>	81 x 27-41	marine, attached to worms (Oligochaeta: naidid (<i>Peloscolex benedeni</i>))	epizoic	Europe
<i>C. physaloides</i> (syn. <i>Planicola</i>)	15	freshwater	free-living	Europe
<i>C. plachteri</i>	127 x 30	freshwater, attached to crayfish (Decapoda: astacid (<i>Astacus astacus</i> , <i>Austropotamobius torrentium</i>))	epizoic (appendages)	North America
<i>C. planorbicula</i> (syn. <i>Planicola</i>)		freshwater, attached to invertebrates (Gastropoda: planorbid (<i>Planorbis complanatus</i>))	epizoic	Europe
<i>C. plectostyla</i> (syn. <i>Cothurniopsis canthocampti</i>)	80-100 x 30-40	freshwater, attached to invertebrates (Copepoda: canthocamptid (<i>Canthocamptus</i>))	epizoic	Europe
<i>C. poculum</i>	40	marine	free-living	North America
<i>C. procera</i> (syn. <i>Planicola</i>)	50	freshwater, attached to algae	epiphytic	Europe
<i>C. propinqua</i>	60 x 23	estuarine, attached to invertebrates (Copepoda: cyclopid (<i>Cyclops</i>), harpacticid (unspecified))	epizoic	Eurasia
<i>C. pupa</i>		freshwater	free-living	Europe
<i>C. radicata</i>		freshwater	free-living	Europe
<i>C. recurva</i>	75 45-75 x 17-35	estuarine, attached to invertebrates (Copepoda: cyclopid (<i>Cyclops</i>), harpacticid (unspecified), Insecta (unspecified aquatic species))	epizoic	Eurasia
<i>C. recurvata</i>	100 x 50	brackish water, attached to algae	epiphytic	Europe
<i>C. reniformis</i>		freshwater	free-living	Europe

<i>C. rhabdota</i> (syn. <i>Sinocothurnia</i>)	125-130 x 40-42	marine, attached to red algae (<i>Polysiphonia nigrescens</i>)	epiphytic	Europe
<i>C. richtersi</i> (syn. <i>Cothurniopsis</i>)	45-60 x 30-35	freshwater, attached to moss	epiphytic	Europe, Antarctica
<i>C. ruthae</i>	66 x 30	freshwater	free-living	Europe
<i>C. sahrhagei</i>		marine	free-living	Europe
<i>C. salina</i>	80-98 x 12-19	hypersaline lake	free-living	China
<i>C. scyphoides</i>	22	freshwater swamp, attached to algae	free-living, epiphytic	Europe
<i>C. sevastopoli</i>		marine, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus olivii</i>))	epizoic, body, legs)	Black Sea
<i>C. sieboldii</i>	113-132 x 30-49	freshwater, attached to crayfish (Decapoda: astacid (<i>Astacus astacus</i> , <i>Austropotamobius torrentium</i>) and other 'entomostraca')	epizoic (branchial appendages)	Europe
<i>C. simplex</i>	50-60 x 23	marine, attached to algae	epiphytic	Europe
<i>C. sinuosa</i> (syn. <i>Sinocothurnia</i>)	90-100 x 35-40	marine, attached to algae	epiphytic	North America
<i>C. soldida</i>	68 x 30	freshwater, attached to detritus and plants	free-living, epiphytic	Eurasia
<i>C. spinosa</i>		marine	free-living	Europe
<i>C. spissa</i> (syn. <i>C. calix</i>)	50-60 x 30-35	marine and freshwater, attached to thread- like green algae	epiphytic	North America
<i>C. striata</i>		marine	free-living	Europe
<i>C. stylarioides</i>	121 x 32	marine, attached to worms (Polychaeta: flabelligerid (<i>Stylarioides plumosus</i>))	epizoic	Eurasia
<i>C. subglobosa</i> (syn. <i>Cothurniopsis</i>)	45-50 x 46-52	marine, attached to invertebrates (Ostracods: cytherid (<i>Cythereis</i>))	epizoic	Antarctica
<i>C. subtilis</i>	65-72 x 28	marine, attached to mussels (Bivalvia: mytilid (<i>Mytilus edulis</i>))	epizoic	Eurasia
<i>C. tekirghiolica</i>	80 x 30	freshwater, attached to filamentous green algae (<i>Cladophora</i>)	epiphytic	Eurasia
<i>C. tenuicula</i> (syn. <i>Planicola</i>)		freshwater, attached to algae	epiphytic	Europe
<i>C. tespa</i> (syn. <i>Daurotheca</i>)	86-92 x 58-64	freshwater, attached to crayfish (Decapoda: astacid (<i>Pacifastacus</i> <i>leniusculus</i>))	epizoic (gills)	Asia
<i>C. tincta</i> (syn. <i>Planicola</i>)		freshwater	free-living	Europe
<i>C. transoceanica</i> (syn. <i>Daurotheca</i>)	69-74 x 60-75	freshwater, attached to crayfish (Decapoda: astacid (<i>Pacifastacus</i> <i>leniusculus</i>))	epizoic	Holarctic
<i>C. triangula</i>	45 x 18	marine, attached to invertebrates (Trombidiformes: halacarid (<i>Copidognathus fabriciusi</i>); Ostracoda: cytherid (<i>Cythereis tuberculata</i>))	epizoic	Europe
<i>C. trophoniae</i> (syn. <i>C. pedunculata</i> , <i>nodosa</i> , <i>sahrhagei</i> , <i>Vorticella pedunculata</i>)	60-140 x 26-50	marine, attached to algae (<i>Polysiphonia</i> <i>violacea</i>) and invertebrates (Polychaeta: flabelligerid (<i>Trophonia plumosa</i> , <i>Stylarioides plumosus</i>); Hydrozoa: campanulariid (<i>Laomedea loveni</i>); Pantopoda: callipallenid (<i>Pallene</i> <i>brevirostris</i>))	epiphytic, epizoic	Europe
<i>C. trophonicola</i>	60-85 x 31-35	marine, attached to worms (Polychaeta: flabelligerid (<i>Trophonia plumosa</i>))	epizoic	Asia
<i>C. ussurina</i> (syn. <i>Daurotheca</i>)	69-74 x 42-46	freshwater, attached to crayfish (Decapoda: astacid (<i>Pacifastacus</i>), cambarid (<i>Cambarus</i> , <i>Cambaroides</i> , <i>Orconectes</i>))	epizoic	Eurasia
<i>C. vaga</i>	100 x 45	freshwater, attached to invertebrates (Copepoda: cyclopid (<i>Cyclops</i>);	epizoic	Eurasia

		Amphipoda: gammarid (<i>Gammarus</i>)		
<i>C. variabilis</i> (syn. <i>Daurotheca</i> , <i>D. marginata</i>)	75-130	freshwater, attached to invertebrates (Decapoda: astacid (<i>Astacus leptodactylus</i> , <i>fluviatilis</i>), cambarid (<i>Cambarus affinis</i> , <i>bartonii</i> , <i>diffinis</i> , <i>propinquus</i> , <i>Orconectes limosus</i>))	epizoic (gills)	Europe, North America
<i>C. vas</i>		marine, attached to invertebrates (Amphipoda: crypturopodid (<i>Crypturopus pachytus</i>))	epizoic	Eurasia
<i>C. ventosa</i> (syn. <i>Planicola</i>)		freshwater, attached to algae	epiphytic	Europe
<i>C. vestita</i> (syn. <i>Planicola</i>)		freshwater	free-living	Europe
<i>C. viridis</i> (syn. <i>Planicola</i>)	45	freshwater	free-living	Europe
<i>C. vorticelloides</i>		freshwater	free-living	Europe
<i>C. vulgaris</i>		freshwater	free-living	Europe
<i>C. zhytomirensis</i> (syn. <i>Pachyrocha</i>)	62-78 x 20-28	freshwater (sewage treatment plant)	free-living	Ukraine
Genus: <i>Cothurniopsis</i> (upright erect pseudochitinous lorica, urn-shaped with irregular basal ridges, short stalk, aperture closed by internal valve (operculum) attached to lorica when zooid contracts)[recently suggested this genus be synonymized with <i>Cothurnia</i> on the basis of molecular studies]				
<i>C. dyonisi</i> (syn. <i>Pseudothuricola</i> , <i>Thuricola</i>)	90-100 x 30-35	freshwater, attached to moss	epiphytic	Europe
<i>C. valvata</i> (syn. <i>Cothurnia</i> , <i>C. elastica</i> , <i>Planicola</i>)	50-70 x 25-35	estuarine, attached to filamentous algae and moss	epiphytic	Europe
Genus <i>Cothurnopsis</i> (upright pseudochitinous lorica, urn-shaped, with short stalk, aperture closed by flexible rim when zooid contracts, often on crustacea)				
<i>C. astaci</i> (syn. <i>Cothurnia</i>) [type species]	65-90 x 35-45	freshwater, attached to inanimate substrates and invertebrates (Decapoda: <i>Astacus fluviatilis</i> , <i>leptodactylus</i>) and other 'entomostraca')	epizoic (carapace)	Europe
<i>C. aurea</i> (syn. <i>Baikalotheca</i>)		freshwater	free-living	Russia
<i>C. bavarica</i> (syn. <i>Cothurnia</i>)	85-93 x 49-59	freshwater, attached to crayfish (Decapoda: astacid (<i>Astacus leptodactylus</i>), cambarid (<i>Orconectes limosus</i>))	epizoic (appendages)	Europe
<i>C. curva</i> (syn. <i>Cothurnia</i>)	70-100 x 35-40	freshwater, attached to plants (<i>Ruppia</i>) and crayfish (Decapoda: astacid (<i>Astacus leptodactylus</i>), cambarid (<i>Orconectes limosus</i>) and other 'entomostraca')	epizoic (branchial appendages)	Europe, North America
<i>C. entzi</i> (syn. <i>Cothurnia</i> , <i>Pyxicola</i>)	70-80 x 26-40	marine, attached to filamentous green algae (<i>Cladophora</i>)	epiphytic	Europe
<i>C. minutissima</i> (syn. <i>Cothurnia</i>)		terrestrial (soil)	free-living	Holarctic
<i>C. richtersi</i>		terrestrial (soil)	free-living	Holarctic
<i>C. sieboldii</i>		freshwater, attached to crayfish (Decapoda: astacid (<i>Astacus fluviatilis</i> , <i>torrentium</i>))	epizoic	Europe
Genus: <i>Platycola</i> (decumbent pseudochitinous lorica, attached along one side, simple aperture bends upwards diagonally)				
<i>P. baikalica</i> (syn. <i>Vaginicola</i>)	90 x 67-70	freshwater, attached to invertebrates (Amphipoda: acanthogammarid (<i>Brandtia lata</i> , <i>latissima</i>), gammarid (<i>Gammarus</i> , <i>Echinogammarus fuscus</i>), pallaseid (<i>Pallasea grubei</i>))	epizoic	Lake Baikal
<i>P. butschlii</i> (syn. <i>Vaginicola</i>)	80-100 x 54-110	freshwater, attached to plants and mosses	epiphytic	Europe
<i>P. callistoma</i>	73 x 55	freshwater, attached to cave-dwelling	epizoic	Europe

		invertebrates (Isopoda: sphaeromatid (<i>Microlistra spinosissima</i>))		
<i>P. circularis</i>	40-65	marine, attached to invertebrates (Isopoda: limnoriid (<i>Limnoria</i>))	epizoic (appendages)	Eurasia
<i>P. coelochila</i>	110-115	freshwater, attached to plants (<i>Lemna</i>)	epiphytic	North America
<i>P. decumbens</i> (syn. <i>P. amphora</i> , <i>amphoroides</i> , <i>ampulla</i> , <i>intermedia</i> , <i>longicollis</i> , <i>regularis</i> , <i>reflexa</i> , <i>striata</i> , <i>truncata</i> , <i>Vaginicola</i>) [type species as <i>Vaginicola</i>]	60-170 x 12-110	freshwater, attached to inanimate substrates, detritus, filamentous algae (<i>Nitella</i>), submerged plants (<i>Lemna</i> , <i>Ceratophyllum</i>), and invertebrates (Amphipoda: gammarid (<i>Brachiuropus</i>); Gastropoda: planorbid (<i>Ancylus fusca</i> , <i>Planorbis</i>), lymnaeid (<i>Lymnaea stagnalis</i>); Ephemeroptera: baetid (<i>Cloeon dipterum</i> mayfly larvae) and mollusc shells)	free-living, epiphytic, epizoic	cosmopolitan
<i>P. dilatata</i> (syn. <i>Vaginicola</i> , <i>P. donsi</i>)	75-80 x 50	freshwater, attached to plants and algae	free-living, epiphytic	Eurasia
<i>P. gracilis</i> (syn. <i>Vaginicola</i>)	60 x 37	freshwater, attached to plants and algae	free-living	Europe
<i>P. hydrobiae</i> (syn. <i>Vaginicola</i>)	85-90 x 55	marine, attached to snails (Gastropoda: hydrobiid (<i>Hydrobia</i>))	epizoic	North Sea
<i>P. lageniformis</i>	120 x 50	freshwater, attached to cave-dwelling invertebrates (Isopoda: sphaeromatid (<i>Microlistra spinosissima</i>))	epizoic	Europe
<i>P. mollis</i> (syn. <i>Vaginicola</i>)	80-11 x 32	freshwater, attached to plants and algae	free-living, epiphytic	Europe
<i>P. pala</i> (syn. <i>Vaginicola</i>)	87-97 x 30-70	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Palicarinus Parapallasea puzyllii</i>))	epizoic	Lake Baikal
<i>P. steineri</i> (syn. <i>Vaginicola</i>)	78-88 x 40	freshwater, attached to moss	epiphytic	Europe
Genus: Pyxicola (upright pseudochitinous lorica, elongate but with irregular outline, short stalk, aperture closed when zooid contracts, operculum (valve) attached to zooid (not lorica)) [no fixed type species]				
<i>P. affinis</i> (syn. <i>Cothurnia</i>)	80 x 40	freshwater, attached to plants	epiphytic	Europe
<i>P. carteri</i> (syn. <i>P. constricta</i> , <i>nolandi</i> , <i>annulata</i> , <i>striata</i>)	60-96 x 12-34	freshwater, attached mostly to filamentous algae, sometimes to aquatic plants (<i>Pontederia</i>)	free-living, epiphytic	Eurasia, Americas
<i>P. ligiae</i> (syn. <i>Cothurnia</i>)	55	marine, attached to invertebrates (Isopoda: ligiid (<i>Ligia oceanica</i>))	epizoic (gills)	Europe
<i>P. limbata</i>	75-80	freshwater	free-living	Europe
<i>P. operculigera</i>	45-70 x 22-35	brackish water, attached to plants and invertebrates (Hydrozoa: cordylophorid (<i>Cordylophora</i>))	epiphytic, epizoic	Eurasia
<i>P. ovata</i>	40 x 35	freshwater	free-living	China
<i>P. psammata</i>	75-85 x 23-35	freshwater, attached to invertebrates (Isopoda: sphaeromatid (<i>Microlistra spinosissima</i>))	epizoic	Eurasia
<i>P. pusilla</i> (syn. <i>Cothurnia</i> , <i>C. furcifer</i> , <i>P. carteri</i> p.p., <i>eforiana</i> , <i>furcifer</i> , <i>valvata</i> , <i>Caulicola valvata</i>)	45-80 x 22-46	fresh and brackish water, attached to inanimate substrates and plants	free-living, epiphytic	Eurasia, North America
<i>P. pyxidiformis</i> (syn. <i>Caulicola</i>)	160	freshwater, attached to inanimate substrates and plants (water lilies)	free-living, epiphytic	Eurasia
<i>P. socialis</i> (syn. <i>Cothurnia</i>)	100	marine	free-living	Europe
Genus: Thuricola (upright erect pseudochitinous lorica, cylindrical, without stalk, aperture closed by internal valve (operculum) attached to lorica when zooid contracts, some with zoochlorellae)				

<i>T. constricta</i> (possible syn. of <i>T. valvata</i>)	160-174 x 62-70	marine	free-living	Europe
<i>T. elegans</i> (syn. <i>Cothurnia</i>)	65-75 x 30	brackish water, attached to algae	epiphytic	Europe
<i>T. folliculata</i> (syn. <i>Cothurnia regalis</i> p.p., <i>crystallina</i> p.p., <i>obliqua</i>)	125-420 x 15-25	freshwater and marine, attached to inanimate substrates, detritus, filamentous algae (<i>Enteromorpha intestinalis</i> , <i>Cladophora fracta</i>), sometimes submerged plants (incl. moss), and occasionally terrestrial (peat bogs)	free-living, epiphytic	Europe, America, Australia
<i>T. gracilis</i> (syn. <i>T. pediculata</i> , <i>viridis</i>)	140-220	freshwater, attached to algae and plants	epiphytic	Europe
<i>T. inflata</i>	72-76 x 31-34	freshwater, attached to filamentous algae (<i>Cladophora</i>)	epiphytic	China
<i>T. kellicottiana</i> (syn. <i>T. amphora</i> , <i>innixa</i> , <i>gruberi</i> , <i>amphora</i> p.p., <i>Thuricolopsis</i> , <i>Cothurnia castellensis</i> , <i>crystallina</i> p.p., <i>regalis</i> p.p.)	140-435 x 20-35	freshwater, attached to inanimate substrates and submerged plants (incl. moss)	free-living, epiphytic	Eurasia, Americas
<i>T. obconica</i> (syn. <i>T. fimbriate</i> , <i>kamptostoma</i>)	195-310 x 15-25	brackish water, attached to inert substrates and plants	free-living, epiphytic	Europe
<i>T. parafolliculata</i>	360-400 x 50-60	marine	free-living	China
<i>T. similis</i>	158-248	freshwater (activated sludge)	free-living	Europe
<i>T. valvata</i> (syn. <i>T. aestuarii</i> , <i>operculata</i>) [type species as <i>Vaginicola</i>]	120-360 x 20-30	marine	free-living	cosmopolitan
<i>T. vasiformis</i>	160-300 x 30-59	freshwater, attached to inanimate substrates, and detritus	free-living	Europe
Genus <i>Triacola</i> (fossil taxon, erect pseudochitinous lorica fossilized, short stalk with basal disc, attached to fossilized ostracods)				
<i>T. ostracodarum</i>	95-110 x 50-57	attached to fossilized ostracods		Europe
Genus <i>Vaginicola</i> (upright erect lorica, cylindrical to vase- to urn-shaped, without stalk, open aperture, marine/freshwater)				
<i>V. amadelpa</i>		freshwater	free-living	Europe
<i>V. amphora</i> (syn. <i>Cothurnia</i> , <i>Platycola</i> , <i>Thuricola amphora</i> p.p.)	90-100	marine, attached to algae (<i>Vaucheria</i>) and invertebrates (Amphipoda: gammarid (<i>Brachyropus reicherti</i>))	epiphytic, epizoid	Eurasia
<i>V. amphorella</i> (syn. <i>Cothurnia</i>)	66	freshwater, attached to algae	epiphytic	New Zealand
<i>V. ampulla</i> (syn. <i>Stylocola</i>)	60-200	freshwater, attached to algae	epiphytic	Europe
<i>V. annulata</i>	120	freshwater	free-living	Europe
<i>V. angusta</i>	70-95	freshwater	free-living	China
<i>V. attenuata</i> (syn. <i>Planicola</i> , <i>Cothurnia</i>)	80	freshwater, attached to plants	epiphytic	Europe
<i>V. calceola</i>		freshwater	free-living	Europe
<i>V. cementata</i>		freshwater, attached to cave-dwelling invertebrates (Isopoda: sphaeromatid (<i>Microlistra spinosissima</i>))	epizoid	Europe
<i>V. ceratophylli</i> (syn. <i>Cothurnia</i>)	115-145 x 65-80	freshwater, attached to plants (<i>Ceratophyllum</i>)	epiphytic	Europe
<i>V. chaperoni</i> (syn. <i>Cothurnia</i>)	120	freshwater, attached to moss	epiphytic	Europe
<i>V. compressa</i>	140	marine, attached to algae and invertebrates (Bryozoa (unspecified))	epiphytic, epizoid	Eurasia
<i>V. crassa</i>		freshwater	free-living	Europe

<i>V. cratera</i> (syn. <i>Cothurnia</i>)	150	freshwater, attached to invertebrates (Amphipoda: acanthogammarid (<i>Acanthogammarus victoria</i> , <i>Parapallasea puzilli</i>), gammarid (<i>Gammarus</i> , <i>Echinogammarus lividus</i> , <i>cyaneus</i> , <i>verrucosus</i> , <i>Axelboeckia rubra</i>), pallaseid (<i>Pallasea gruberi</i> , <i>kessleri</i>))	epizoic	Lake Baikal
<i>V. cristata</i>		freshwater	free-living	Europe
<i>V. cylindrica</i> (syn. <i>Platycola</i>)		freshwater	free-living	Europe
<i>V. doliolum</i>	61	freshwater, attached to moss	epiphytic	Eurasia
<i>V. donsi</i> (syn. <i>Cothurnia grandis</i>)	120-150	marine	free-living	Europe
<i>V. elegans</i>	160-170	freshwater, attached to invertebrates (Amphipoda: acanthogammarid (<i>Acanthogammarus victorii</i> , <i>albus</i>), gammarid (<i>Gammarus</i>))	epizoic	Eurasia
<i>V. elongata</i> (syn. <i>Planicola</i>)	60	freshwater	free-living	Europe
<i>V. festivus</i>	100-106 x 34-46	freshwater	free-living	Asia
<i>V. galericulata</i>		freshwater	free-living	Europe
<i>V. gigantea</i> (syn. <i>Cothurnia</i>)	200-460	freshwater, attached to plants	epiphytic	Europe
<i>V. globosa</i> (syn. <i>Cothurnia</i>)		freshwater	free-living	Europe
<i>V. gracilis</i>		freshwater, attached to algae	free-living, epiphytic	Europe
<i>V. grandis</i>	230	freshwater, attached to plants	epiphytic	Europe
<i>V. incisa</i> (syn. <i>Cothurnia</i> , <i>Thuricola</i>)	160-180	freshwater, attached to planktonic cyanobacteria colonies (<i>Gomphosphaeria</i> . <i>Microcystis aeruginosa</i>)	free-living	Africa
<i>V. inclinata</i> (syn. <i>Planicola</i> , <i>Cothurnia</i>)	50	freshwater	free-living	Europe
<i>V. ingenita</i> (syn. <i>Trichoda</i> , <i>Planicola</i> , <i>Cothurnia</i>) [type species as <i>Trichoda</i>]	35-65	freshwater, attached to inanimate substrates, diatoms (<i>Melosira granulata</i> , <i>Fragilaria crotonensis</i>), filamentous algae (<i>Spirogyra</i>), and plants (<i>Lemna</i>)	free-living, epiphytic	Eurasia, America
<i>V. leptosoma</i>	160	freshwater, attached to plants	epiphytic	Europe
<i>V. lobata</i> (syn. <i>Cothurnia</i>)	200	freshwater	free-living	Europe
<i>V. longipes</i>	280	freshwater, attached to plants	epiphytic	Europe
<i>V. longistyla</i>		freshwater	free-living	Eurasia
<i>V. ovata</i>	80	marine	free-living	Europe
<i>V. paguri</i> (syn. <i>Cothurnia</i>)	100	marine, attached to hermit crabs (Decapoda: pagurid (<i>Pagurus bernhadus</i>))	epizoic (surface)	Europe
<i>V. pala</i>		freshwater, attached to invertebrates (Amphipoda: acanthogammarid (<i>Parapallasea puzilli</i>))	epizoic	Lake Baikal
<i>V. parallela</i> (syn. <i>Cothurnia</i>)	100	freshwater, attached to algae	epiphytic	New Zealand
<i>V. parva</i>		freshwater	free-living	Europe
<i>V. plicata</i>	120-150 x 35-42	marine	free-living	Asia
<i>V. pontica</i> (syn. <i>Cothurnia</i>)	171	marine	free-living	Europe
<i>V. sediculum</i> (syn. <i>Cothurnia</i>)	52-57	freshwater, attached to moss (<i>Sphagnum</i>)	epiphytic	Eurasia
<i>V. striata</i> (syn. <i>Stylocola</i>)	55	freshwater	free-living	Europe
<i>V. subcrystallina</i>	100-120	freshwater, attached to algae and plants	epiphytic	Europe, North

(syn. <i>V. crystallina</i> , <i>Planicola</i>)		(<i>Cladophora glomerata</i>)		America
<i>V. sulcata</i> (syn. <i>Cothurnia</i>)	60-70	marine, attached to yellow-green algae (<i>Vaucheria</i>)	epiphytic	Eurasia
<i>V. swarczewskyi</i> (syn. <i>Cothurnia crystallina p.p.</i>)	195	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus</i>))	epizoic	Russia
<i>V. terricola</i> (syn. <i>Cothurnia</i>)	56	freshwater, attached to moss	epiphytic	Europe
<i>V. tinctoria</i> (syn. <i>V. lagena</i>)	75-175 x 28-71	freshwater, attached to inanimate substrates, filamentous algae (<i>Spirogyra</i>), submerged plants (<i>Myriophyllum</i> , <i>Lemna</i> , <i>Pontederia</i> , <i>Utricularia</i> , <i>Spirodela</i> , and water lilies)	free-living, epiphytic	Eurasia, Americas
<i>V. undata</i>		freshwater	free-living	Europe
<i>V. vas</i> (syn. <i>Cothurnia</i>)	115-125	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Crypturopus pachytus</i>))		Lake Baikal
<i>V. vestita</i> (syn. <i>Planicola</i>)	60	freshwater	free-living	Europe
<i>V. virgula</i> (syn. <i>Cothurnia</i>)	51	freshwater, attached to moss	epiphytic	Europe
<i>V. wangi</i>	155	marine, attached to algae	epiphytic	Europe
Family: Lagenophryidae				
Genus: <i>Chilenophrys</i> (body rounded, within flat hemispherical lorica, without stalk, lorica aperture an invaginated tube (loricostome) perpendicular to long axis, aperture closed by operculum)				
<i>C. allendei</i> (syn. <i>Stylohedra</i> , <i>Lagenophrys</i>)	62-67 x 48-52 x 22-24	freshwater, attached to crayfish (Decapoda: parastacid (<i>Parastacus pugnax, chilensis</i>))	epizoic	South America
Genus: <i>Clistolagenophrys</i> (body rounded, within flat discoid lorica, lorica aperture an invaginated tube (loricostome) perpendicular to long axis, aperture closed by loricostome retraction bringing together bases of flexible opposing lips)				
<i>C. primitiva</i> [type species as <i>Lagenophrys</i>]	100 x 90 x 30	freshwater, attached to invertebrates (Amphipoda: pallaseid (<i>Pallasea cancellus</i>))	epizoic (appendages)	Lake Baikal
Genus <i>Lagenophrys</i> (body rounded, within flat hemispherical lorica, without stalk, lorica aperture an invaginated tube (loricostome) perpendicular to long axis, aperture closed by drawing together flexible opposing lips)				
<i>L. aegleae</i>	53-62 x 59-65 x 12-18	freshwater, attached to crabs (Decapoda: aegleid (<i>Aegla castro, franca, laevis</i>))	epizoic (gills)	South America
<i>L. amupulla</i>	50-75	freshwater, attached to invertebrates (Amphipoda: acanthogammarid (<i>Acanthogammarus victorii, albus, godlewskii, Brandtia latissima, Diplacanthus brevispinus, Dorogammarus castaneus, Garjajewia cabanisii, Hyalellopsis czyrnianskii, variabilis, Parapallasea puzilli</i>), crangonyctid (<i>Crangonyx</i>), crypturopodid (<i>Crypturopus inflatus, pachytus, rugosus, tuberculatus, Echiuropus macronychus</i>), eulimnogammarid (<i>Eulimnogammarus aheneus, capreolus, cruentus, cyaneus, cyanooides, fuscus, lividus, maackii, olivaceus, sophianosii, verrucosus, viridis, Heterogrammus sophianosii, Odontogammarus calcaratus, margaritaceus</i>), gammarid (<i>Axelboeckia carpenteri, potanini, Carinogammarus cinammomeus, rhodophthalmus, Echinogammarus berilloni, Eucarinogammarus waggii, Gammarus annandalei, lacustris, duebeni, pulex</i>), micropodid (<i>Gmelinoides fasciatus, Micruropus fixsenii, glaber, klukii</i> ,	epizoic (gills)	Eurasia, Americas

		<i>littoralis, rugosus, talitroides, wahlII, vortex</i>), ommatogammarid (<i>Ommatogammarus flavus</i>), pallaseid (<i>Pallasea cancellus, cancelloides, grubei, kessleri</i>); Isopoda: asellid (<i>Asellus aquaticus</i>)		
<i>L. andos</i> (syn. <i>Circolagenophrys</i>)	95-102 x 72-76 x 9-12	freshwater, attached to crayfish (Decapoda: parastacid (<i>Parastacus pugnax, chilensis</i>))	epizoic (gills)	South America
<i>L. anisogammari</i> (syn. <i>Circolagenophrys</i>)	65-72 x 64-68	marine, attached to invertebrates (Amphipoda: anisogammarid (<i>Anisogammarus locustoides</i>))	epizoic (branchial plates)	Asia
<i>L. antichthos</i>	42-79 x 50-94 x 15-23	freshwater, attached to crayfish (Decapoda: parastacid (<i>Parastacus defossus, varicosus, nicoleti, pugnax, saffordi</i>))	epizoic (gills)	South America
<i>L. aselli</i>	80-95 x 78-87	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus, Caecidotea attenuata, communis, forbesi, laticauda, occidentalis, racovitzai, Lirceus lineatus</i>))	epizoic (gills, appendages)	Europe, North America
<i>L. awerinzewi</i>		freshwater, attached to crabs (Decapoda: gecarcinucid (<i>Barytelphusa guerini, cunicularis, Esantheiphusa dugasti, Maydelliathelphusa falcidigitis</i>), potamid (<i>Apotomonautes hainanensis, Demanietta manii, Isolapotamon kinabaluense, Potamon denticulatus, dehaani, fluviatilis, Sinopotamon davidi</i>), potamonautid (<i>Liberonautes latidactylus, Potamonautes niloticus</i>))	epizoic (gills)	cosmopolitan
<i>L. branchiarum</i>	58 x 63	freshwater, attached to shrimp (Decapoda: palaemonid (<i>Macrobrachium (Palaemon) nipponense</i>))	epizoic (gills)	China
<i>L. callinectes</i>	53-65 x 51-60 x 10-21	marine, attached to crabs (Decapoda: portunid (<i>Callinectes sapidus, bocourti, maracaiboensis</i>), and shrimp (Decapoda: palaemonid (<i>Palaemonetes</i>))	epizoic (gills)	North America
<i>L. cochinchensis</i>	42-73 x 46-73	marine, attached to invertebrates (Isopoda: sphaeromatid (<i>Sphaeroma terebrans, walkeri, annandalei, triste, quoyanum, Exosphaeroma planulum</i>)); Tanaidacea: parapseudid (<i>Ctenapseudes chilkenis</i>))	epizoic (appendages)	cosmopolitan
<i>L. commensalis</i>	90 x 60 x 35	freshwater, attached to invertebrates (Amphipoda: acanthogammarid (<i>Carinurus solsky</i>))	epizoic (maxillipeds)	Lake Baikal
<i>L. crutchfieldi</i> (syn. <i>Circolagenophrys</i>)	60-76 x 55-72 x 18-26	estuarine, attached to invertebrates (Amphipoda: hyalid (<i>Parhyale hawaiiensis, penicillata</i>))	epizoic (gills)	Americas
<i>L. darwinia</i>	42 x 55	freshwater, attached to crayfish (Decapoda: parastacid (<i>Cherax quadricarinatus</i>))	epizoic (gills)	Australia
<i>L. dennisi</i>	51-72 x 40-66 x 15-29	freshwater, attached to crayfish (Decapoda: cambarid (<i>Cambarus patzcuarensis, Cambarus bartonii, chasmodactylus, Orconectes illinoiensis</i>))	epizoic (carapace)	North America
<i>L. deserti</i>	50 x 57	freshwater, attached to crayfish (Decapoda: parastacid (<i>Cherax quinquecarinatus, tenuimanus</i>))	epizoic (gills)	Australia
<i>L. diogenes</i> (syn. <i>Circolagenophrys, L. incompta</i>)	55-77 x 53-73 x 19-39	freshwater, attached to crayfish (Decapoda: cambarid (<i>Cambarus diogenes, Orconectes illinoiensis</i>))	epizoic (gills)	North America

<i>L. discoidea</i> (syn. <i>L. labiata</i> p.p., <i>wallengreni</i> , <i>Circolagenophrys</i> <i>entocytheris</i>)	46-70 x 33-63 x 18-19	fresh and brackish water, attached to invertebrates (Ostracoda: candonid (<i>Candona elliptica</i> , <i>neglecta</i>), cyclocypridid (<i>Cyclocypris ovum</i> , <i>sharpei</i>), cypridid (<i>Chlamydotheca arcuata</i> , <i>Cypria ophthalmica</i> , <i>obesa</i> , <i>Cypridopsis vidua</i> , <i>Heterocypris similis</i>), entocytherid (<i>Ankylocythere hobbsi</i> , <i>ancyla</i> , <i>Dactylocythere daphnoides</i> , <i>jeanae</i> , <i>Donnaldsoncythere donnaldsonensis</i> , <i>Thermastrocythere riojai</i>); Amphipoda: crangonyctid (<i>Crangonyx gracilis</i>), gammarid (<i>Gammarus fossarum</i> , <i>daiberi</i> , <i>fasciatus</i> , <i>tigrinus</i> , <i>pulex</i>); Decapoda: astacid (<i>Pacifastacus nigrescens</i>), cambarid (<i>Cambarus chasmodactylus</i> , <i>bartonii</i> , <i>Orconectes illinoiensis</i>)	epizoic (carapace, appendages)	Eurasia, Americas
<i>L. dungogi</i>	70 x 69	freshwater, attached to crayfish (Decapoda: parastacid (<i>Euastacus clydensis</i>))	epizoic (gills)	Australia
<i>L. engaei</i>	54-63 x 54-55	freshwater, attached to crayfish (Decapoda: parastacid (<i>Engaeus hemicirratu</i> s, <i>victoriensis</i> , <i>Paranephrops planifrons</i>))	epizoic (gills, appendages)	Australia, New Zealand
<i>L. eupagurus</i> (syn. <i>L. paguri</i> , <i>lunatus</i> , <i>articularis</i>)	39-75 x 39-77 x 10-23	freshwater or marine, attached to invertebrates (Decapoda: pagurid (<i>Pagurus longicarpus</i> , <i>Eupagrus</i>), palaemonid (<i>Macrobrachium nipponense</i> , <i>rosenbergii</i> , <i>ohione</i> , <i>Palaemonetes varians</i> , <i>pugio</i> , <i>intermedius</i> , <i>kadiakensis</i> , <i>paludosus</i> , <i>vulgaris</i> , <i>Palaemon paucidens</i> , <i>Leander paucidens</i>), penaeid (<i>Farfantepenaeus brasiliensis</i> , <i>Litopenaeus setiferus</i> , <i>vannamei</i>), upogebiid (<i>Upogebia affinis</i>); Amphipoda: corophiid (<i>Apocorophium acutum</i>))	epizoic (gills, appendages)	Eurasia, Americas
<i>L. foxi</i>	54-67 x 58-68 x 15-26	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus minus</i> , <i>pseudolimnaeus</i> , <i>trogophilus</i>))	epizoic (gills)	North America
<i>L. hokkaidos</i> (syn. <i>L. ampulla</i> p.p., <i>Circolagenophrys</i> .)	50-65 x 62	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Jesogrammarus annandalei</i> , <i>Gammarus pulex</i> , <i>roeseli</i>))	epizoic (gills, appendages)	Eurasia
<i>L. inflata</i> (syn. <i>Circolagenophrys</i>)	67 x 59 x 25	freshwater, attached to invertebrates (Amphipoda: acanthogammarid (<i>Brandtia Gmelinoides</i>) <i>fasciata</i>))	epizoic (pleopods)	Lake Baikal
<i>L. jacobi</i> (syn. <i>Stylohedra</i>) [nomen dubium, possible mixture of species]	-	freshwater, attached to crayfish (Decapoda: parastacid (<i>Engaeus fultoni</i> , <i>hemicirratu</i> s, <i>Euastacus</i> , <i>Cherax rotundus</i>); Isopoda: phreatoicid (<i>Colubotelson</i>))	epizoic (setae, appendages)	Australia
<i>L. johnsoni</i> (syn. <i>L. labiata</i> p.p.)	56-70 x 44-62 x 12-22	fresh and brackish water, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus fasciatus</i> , <i>daiberi</i> , <i>tigrinus</i>), crangonyctid (<i>Crangonyx gracilis</i>))	epizoic (gills)	North America
<i>L. leniusculus</i> (syn. <i>Circolagenophrys</i> , <i>L. oregonensis</i>)	56-70 x 58-63 x 14-23	freshwater, attached to crayfish (Decapoda: astacid (<i>Pacifastacus connectens</i> , <i>leniusculus</i>))	epizoic (gills)	Europe, North America
<i>L. lenticula</i> (syn. <i>Stylohedra</i> , <i>L.</i> <i>lenticulata</i>)	60	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus lacustris</i> , <i>pulex</i>), crangonyctid (<i>Crangonyx gracilis</i>), hyalellid (<i>Hyalella</i>	epizoic (pereopods)	Eurasia, Americas

		<i>azteca, curvispina, dentata</i>)		
<i>L. limnoriae</i> (syn. <i>Circolagenophrys circularis, Platycola</i>)	39-51 x 38-46 x 15-27	marine, attached to invertebrates (Isopoda: limnoriid (<i>Limnoria lignorum, tripunctata</i>))	epizoic (pleopods)	North America, Europe
<i>L. machaerigera</i> (syn. <i>Circolagenophrys</i>)	74-84 x 64-71 x 18-28	freshwater, attached to crabs (Decapoda: potamonautid (<i>Foza goudoti</i>))	epizoic (gill)s	Madagascar
<i>L. macrostoma</i> (syn. <i>Circolagenophrys</i>)	80 x 65 x 23	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Carinogammarus/Coniurus radoschkowskii</i>))	epizoic (gills)	Lake Baikal
<i>L. matthesi</i>	65-82 x 60-78 x 30-40	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus pulex, zaddachi, roeseli</i>))	epizoic (appendages)	Europe
<i>L. maxillaris</i> (syn. <i>Circolagenophrys</i>)	66-88 x 57-78 x 15-30	marine and brackish water, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus locusta, oceanicus</i>))	epizoic (maxillipeds)	Europe
<i>L. metopauliadis</i>	80 x 94	freshwater (tank bromeliads), attached to bromeliad crab (Decapoda: sesamid (<i>Metopaulis depressus</i>))	epizoic (gills)	Jamaica
<i>L. missouriensis</i>	62-69 x 53-60 x 14-28	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus pseudolimnaeus</i>))	epizoic (appendages)	North America
<i>L. monolistrae</i>	55-85	freshwater, attached to invertebrates (Isopoda: asellid (<i>Caecidotea (Monlistra) berica, racovitzai, caeca</i>))	epizoic (pleopods)	Europe
<i>L. nassa</i>	60-85 x 48-75 x 20-30	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus pulex, lacustris, roeseli, Eogrammarus confervicolus, Echinogrammarus berilloni</i>))	epizoic (carapace, appendages)	Europe, North America
<i>L. novazealandae</i>	52-61 x 59-68 x 17-27	freshwater, attached to crayfish (Decapoda: parastacid (<i>Paranephrops setosus, zealandicus</i>))	epizoic (gills)	New Zealand
<i>L. oblonga</i> (syn. <i>Circolagenophrys</i>)	70 x 45 x 48	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Gammarus hyacinthinus</i>))	epizoic (antennae)	Lake Baikal
<i>L. orchestiae</i>	65 x 55	estuarine, attached to invertebrates (Amphipoda: talitrid (<i>Orchestia cavimana, uhleri</i>))	epizoic (gills)	Europe, North America
<i>L. ornata</i> (syn. <i>Circolagenophrys</i>)	80 x 54 x 30	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Echinogrammarus cyanoides, Carinogrammarus rhodophthalmus sablotzkii</i>))	epizoic (pereiopods)	Lake Baikal
<i>L. ovalis</i> (syn. <i>Circolagenophrys</i>)	85 x 71 x 32	freshwater, attached to invertebrates (Amphipoda: acanthogammarid (<i>Hyalellopsis variabilis</i>), eulimnogammarid (<i>Eulimnogammarus cyanoides, Macropereiopus wagneri</i>), micruropodid (<i>Micruropus littoralis, talitroides</i>))	epizoic (pereiopods)	Lake Baikal
<i>L. parva</i> (syn. <i>Circolagenophrys</i>)	56 x 23	freshwater, attached to invertebrates (Amphipoda: cryptuopodid (<i>Crypturopus pachytus</i>), eulimnogammarid (<i>Eulimnogammarus fiscus</i>))	epizoic (pereiopods)	Lake Baikal
<i>L. patina</i> (syn. <i>L. labiata p.p.</i>)	50-75 x 50-78 x 13-25	freshwater, attached to invertebrates (Amphipoda: acanthogammarid (<i>Hyalella azteca, curvispina</i>), crangonyctid (<i>Crangonyx gracilis</i>), gammarid (<i>Gammarus lacustris, pulex</i>), talitrid (<i>Orchestia cavimana</i>))	epizoic (body)	Eurasia, North America
<i>L. petila</i>	93-126 x 32-45	freshwater, attached to crayfish (Decapoda: parastacid (<i>Parastacoides</i>	epizoic (gills, pleopods)	Australia

		<i>tasmanicus</i>)		
<i>L. platei</i>	56 x 60	freshwater, attached to invertebrates (Isopoda: asellid (<i>Asellus aquaticus</i>); Amphipoda: gammarid (<i>Gammarus pulex</i>))	epizoic (gills)	Europe
<i>L. pontocaspica</i>	50-65 x 50-65 x 29-33	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Amathillina cristata</i> , <i>Chaetogrammarus ischnus</i> , <i>Dikerogrammarus haemobaphes</i> , <i>villosus</i> , <i>Obesogrammarus crassus</i> , <i>Pontogrammarus abbreviatus</i> , <i>maeoticus</i> , <i>robustoides</i>))	epizoic (gills, oostegites)	Europe
<i>L. reflexa</i> (syn. <i>Stylohedra</i>)	-	freshwater, attached to invertebrates (Isopoda: amphispodid (<i>Mesamphisopus capensis</i>))	epizoic (setae)	Africa
<i>L. rugosa</i>	53 x 69	freshwater, attached to crayfish (Decapoda: parastacid (<i>Engaeus marmoratus</i> , <i>Geocharax falcata</i>))	epizoic (gills)	Australia
<i>L. shiftus</i> (syn. <i>Circolagenophrys</i>)	54-60 x 44-46 x 24-27	freshwater, attached to crayfish (Decapoda: parastacid (<i>Parastacus pugnax</i> , <i>chilensis</i>))	epizoic (gills)	South America
<i>L. similis</i> (syn. <i>Circolagenophrys</i>)	85 x 38	freshwater, attached to invertebrates (Amphipoda: acanthogammarid (<i>Hyallopsis czyrnianskii</i>), eulimnogammarid (<i>Eulimnogammarus verrucosus</i>))	epizoic (gills)	Lake Baikal
<i>L. simplex</i> (syn. <i>Circolagenophrys</i>)	75 x 35	freshwater, attached to invertebrates (Amphipoda: acanthogammarid (<i>Dorogammarus castaneus</i>), pallaseid (<i>Pallasea bicornis</i>))	epizoic (pereiopods)	Lake Baikal
<i>L. solida</i>	105 x 77 x 33	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Plesiogammarus gerstaeckeri</i>))	epizoic (pereiopods)	Lake Baikal
<i>L. stammeri</i>	88-104 x 88-97 x 40-45	freshwater, attached to invertebrates (Ostracoda: cypridid (<i>Cypria ophthalmica</i>))	epizoic (carapace)	Europe
<i>L. stokesi</i>	100 x 42	freshwater, attached to invertebrates (Amphipoda: gammarid (<i>Axelboeckia potanini</i>), eulimnogammarid (<i>Odontogammarus calcaratus</i>), ommatogammarid (<i>Ommatogammarus flavus</i> , <i>carneolus</i>))	epizoic (gills)	Lake Baikal
<i>L. stygia</i> (syn. <i>L. labiata</i> p.p., <i>Circolagenophrys</i>)	45-73 x 44-68 x 14-22	freshwater, attached to invertebrates (Amphipoda: crangoncytid (<i>Bactrurus mucronatus</i>))	epizoic (gills)	North America
<i>L. tattersalli</i>	50-70 x 50-70 x 20-25	marine, attached to invertebrates (Amphipoda: gammarid (<i>Echinogammarus marinus</i>))	epizoic (gills)	Europe
<i>L. turneri</i> (syn. <i>Circolagenophrys</i>)	51-62 x 54-67 x 13-21	freshwater, attached to shrimps (Decapoda: palaemonid (<i>Macrobrachium rosenbergii</i>))	epizoic (gills)	Australasia
<i>L. vaginicola</i> (syn. <i>L. obovata</i>) [type species]	45-80 x 42	freshwater, attached to invertebrates (Copepoda: cyclopid (<i>Cyclops minutus</i>), canthocamptid (<i>Bryocamptus minutus</i> , <i>Canthocamptus staphylinus</i>), harpacticoid (unspecified); Isopoda: asellid (<i>Asellus aquaticus</i>))	epizoic	Eurasia, America
<i>L. verecunda</i>	61-93 x 70-99 x 19-25	freshwater, attached to shrimp (Decapoda: palaemonid (<i>Palaemonetes kadiakensis</i> , <i>paludosus</i>))	epizoic (gills)	North America
<i>L. willisi</i>	44-55 x 64-80	freshwater, attached to crayfish (Decapoda: parastacid (<i>Cherax albidus</i> , <i>destructor</i> , <i>rotundus</i> , <i>setosus</i>))	epizoic (gills)	Australia

Genus: <i>Operculigera</i> (body rounded, with flat discoid lorica, without stalk, aperture a simple opening with a flap-like operculum used for closure, on marine/freshwater crustacea)				
<i>O. asymmetrica</i>	69-80 x 67-81 x 20-31	freshwater, attached to crayfish (Decapoda: parastacid (<i>Parastacus pugnax</i> , <i>Samastacus spinifrons</i>))	epizoic (gills)	South America
<i>O. carcini</i>	75-81 x 67-75 x 17-27	freshwater, attached to crabs (Decapoda: potamonautid (<i>Foza goudoti</i>))	epizoic (gills)	Madagascar
<i>O. haswelli</i>	70-83 x 74-89 x 14-21	freshwater, attached to invertebrates (Isopoda: phreatoicid (<i>Mesacanthotelson tasmaniae</i>))	epizoic (pleopods)	Australia
<i>O. inornata</i>	60-76 x 53-76 x 15-23	freshwater, attached to invertebrates (Isopoda: phreatoicid (<i>Phreatoicopsis terricola</i> , <i>Colubotelson chiltoni</i>))	epizoic (pleopods)	Australia
<i>O. insolita</i>	97-113 x 101-118 x 30-46	freshwater, attached to crayfish (Decapoda: parastacid (<i>Parastacus pugnax</i>))	epizoic (gills)	South America
<i>O. madagascarensis</i>	62-73 x 69-83 x 16-25	freshwater, attached to crayfish (Decapoda: astacid (<i>Astacoides granulimanus</i>))	epizoic (gills)	Madagascar
<i>O. montanea</i> [type species]	54-62 x 57-71 x 34-41	freshwater, attached to invertebrates (Isopoda: phreatoicid (<i>Colubotelson joyneri</i> , <i>searlei</i>))	epizoic (pleopods)	Australia
<i>O. obstipa</i>	58-71 x 66-79 x 19-28	freshwater, attached to invertebrates (Isopoda: phreatoicid (<i>Metaphreatoicus australis</i>))	epizoic (pleopods)	Australia
<i>O. parastacis</i>	84-87 x 86-92 x 45	freshwater, attached to crayfish (Decapoda: parastacid (<i>Parastacus pugnax/chilensis</i> (as <i>nicoleti</i>))	epizoic (gills)	South America
<i>O. seticola</i>	71-81 x 47-56 x 33-43	freshwater, attached to crayfish (Decapoda: parastacid (<i>Parastacus pugnax</i>))	epizoic (setae)	South America
<i>O. striata</i>	50-70 x 95-104 x 26-28	freshwater, attached to crayfish (Decapoda: parastacid (<i>Parastacus pugnax/chilensis</i>))	epizoic (gills)	South America
<i>O. taura</i>	66-79 x 82-95 x 26-43	freshwater, attached to crayfish (Decapoda: parastacid (<i>Parastacus pugnax</i>))	epizoic (gills)	South America
<i>O. velata</i>	78-85 x 73-77	freshwater, attached to invertebrates (Decapoda: aeglid (<i>Aegla laevis</i>))	epizoic (gills)	South America
<i>O. zeehanensis</i>	74-82 x 78-89 x 29-33	freshwater, attached to invertebrates (Isopoda: phreatoicid (<i>Phreatoicoides longicollis</i>))	epizoic (pleopods)	Australia
Genus: <i>Paralagenophrys</i> (body rounded, with discoidal lorica, lorica aperture an invaginated tube (loricastome) at oblique angle to long axis, aperture closed by drawing together flexible opposing lips, monotypic)				
<i>P. singularis</i> [type species as <i>Lagenophrys</i>]	78-94 x 70-82 x 21-32	freshwater, attached to detritus, aquatic plants (<i>Lemna</i> , <i>Myriophyllum</i> , <i>Utricularia</i>), mosses (on cypress <i>Ludwigia</i>), snails (Gastropoda: amnicolid (<i>Amnicola</i>), barnacles Cirripedia: cyprid (<i>Cypris</i>) and crayfish (Decapoda: cambarid (<i>Cambarus bartonii</i>))	epiphytic, epizoic	North America
Genus: <i>Setonophrys</i> (body rounded, within flat discoid lorica, lorica aperture an invaginated tube (loricastome) perpendicular to long axis, aperture closed by bringing together rigid anterior lip and flexible posterior retractable lip)				
<i>S. bispinosa</i> (syn. <i>Lagenophrys</i>)	94 x 95	freshwater, attached to crayfish (Decapoda: parastacid (<i>Cherax rotundus</i>))	epizoic (appendages)	Australia
<i>S. communis</i> (syn. <i>Lagenophrys</i> , <i>L. latispinosa</i> , <i>lawrii</i>)	59-102 x 55-96 x 15-28	freshwater, attached to crayfish (Decapoda: parastacid (<i>Cherax albidus</i> , <i>destructor</i> , <i>quadricarinatus</i> , <i>Engaeus marmoratus</i> , <i>Euastacus armatus</i> , <i>nobilis</i>) and isopods (Isopoda: amphisopid (<i>Synamphisopus ambiguous</i>))	epizoic (gills, appendages)	Australia
<i>S. lingulata</i> (syn. <i>Lagenophrys</i>)	50-60 x 58-84 x 20-27	freshwater, attached to crayfish (Decapoda: parastacid (<i>Cherax albidus</i> ,	epizoic (gills)	Australia

		<i>depressus, destructor, rotundus</i>)		
<i>S. nivalis</i> (syn. <i>Lagenophrys</i> , <i>Circolagenophrys</i>)	90-103 x 75-86 x 22-30	freshwater, attached to isopods (Isopoda: phreatoicid (<i>Colubotelson searlei</i>))	epizoic (carapace, appendages)	Australia, Russia
<i>S. occlusa</i> (syn. <i>Lagenophrys</i>)	67-75 x 64-71	freshwater, attached to crayfish (Decapoda: parastacid (<i>Cherax albidus</i> , <i>destructor, rotundus, Geocharax falcata</i>))	epizoic (gills)	Australia
<i>S. seticola</i> [type species as <i>Lagenophrys</i>]	100-119 x 36-43 x 23-29	freshwater, attached to crayfish (Decapoda: parastacid (<i>Cherax albidus</i> , <i>destructor, rotundus setosus, Engaeus</i> <i>fultoni, Euastacus nobilis, Geocharax</i> <i>falcata</i>))	epizoic (setae)	Australia
<i>S. spinosa</i> (syn. <i>Lagenophrys</i>)	78-80 x 77-80	freshwater, attached to crayfish (Decapoda: parastacid (<i>Cherax</i> <i>destructor</i>))	epizoic (carapace)	Australia
<i>S. tricorniculata</i>	89-105 x 85-102 x 19-28	freshwater, attached to crayfish (Decapoda: parastacid (<i>Geocharax</i> <i>falcata</i>))	epizoic (pleopods)	Australia

Parasite morphology: Sessiline peritrichous ciliates form 3 basic life-cycle stages: feeding trophonts (zooids); dispersal swimmers (telotrochs); and some species form resistant cysts. Trophonts vary considerably in size, shape and appearance depending on the species and their state of nutrition (well-fed individuals being larger and more robust). Most species form trophonts ranging in size from 10-80 μm , although some species also form macrozooid stages measuring up to 150 μm long. Trophonts may be ovoid to cylindrical to discoid in shape, but they all possess anterior oral cilia. Like all peritrichs, the trophonts have specialized mouthparts with peristomial ciliary wreaths (spirals of cilia) winding counter-clockwise around the apical funnel-shaped buccal cavity down into the cytostome. The ciliary wreaths comprise a prominent paroral membrane (outer haplokinety) accompanied by a smaller series of membranelles (inner polykinety, often triple). Trophonts are sessile as they attach themselves to substrates using a variety of posterior holdfast structures, including small flat adhesive discs (scopulae), short-elongate stalks (solitary or branched) or vase- to disc-like loricae (upright or flat). The stalks of some species may also contain straight or sinusoidal contractile myonemes that allow them to rapidly contract in spiral or zig-zag fashion when disturbed. Species with branched stalks may form large tree-like colonies comprising up to hundreds of individual zooids. When starved, the trophonts of several species have been observed to form small ovoid cysts (10-30 μm in diameter) that are surrounded by tough membranous coats, mostly smooth but some irregular or granular. Telotroch stages are formed often in adverse conditions when trophonts detach from their substrates, stalks or loricae, round up (often barrel-shaped) and form motile unattached swarmer stages. These stages are often mouthless but may retain inert or retracted oral cilia or their primordia. Cell motility occurs by the development of a ring of somatic cilia usually around the posterior body.

Site of infection: Peritrichous ciliates live in aquatic habitats (freshwater, estuarine and marine waters) as free-living species (attached to inanimate objects), epiphytic species (attached to plants) or epizoic species (attached to animals). Infestations have been reported on the superficial surfaces of vertebrates (mainly fish and some amphibians) and invertebrates (crustaceans (decapods, branchiopods, isopods, copepods, amphipods, ostracods), molluscs (gastropods, bivalves), insects, annelids (polychaetes, oligochaetes, leeches), bryozoa and hydrozoa). Infestations may occur on the skin, fins or gills of vertebrates, or on the carapace, brachial chambers or legs (feeding maxillipeds, walking pereopods, swimming pleopods (swimmerets)) of crustaceans. Infestations have been found in wild and cultured animals, and significant biofouling may occur in intensive aquaculture systems when animals are overcrowded in organically-enriched waters.

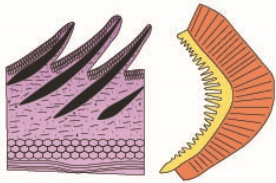
Pathogenesis: Peritrichous ciliates are filter-feeders which use their oral ciliary wreaths to create minute water currents drawing material into the buccal cavity. They feed on solutes and particulates in water, especially bacteria which can often be seen in food vacuoles in the ciliate cytoplasm. They attach themselves to substrates by their posterior ends so that their anterior mouths project outwards into the water column. Many species are considered to be opportunistic ectocommensals of fish and shellfish, but their presence may sometimes cause problems. While ciliates attached to hard surfaces (such as crustacean exoskeletons) do not cause tissue lesions, heavy infestations may cause significant fouling of external surfaces resulting in the unsightly appearance of animals (and reducing their marketability), while fouling of the mouthparts and associated appendages may interfere with host feeding leading to loss of condition. In comparison, ciliates attached to soft tissues (such as gills and skin) may cause some attachment-associated pathologies, with irritation and inflammation leading to gill congestion or skin lesions. Animals may exhibit respiratory disorders, particularly those infested by ciliate species that form loricae cemented to gill filaments thus reducing functional surface areas resulting in hypoxia. Skin lesions reduce the marketability of fish, and make the hosts more prone to secondary infections by bacteria or fungi. Infestations by sessile peritrichs are more severe on small animals (especially fish fry), and are more abundant during the winter months when hosts are more sedentary. They may become problematic in aquaculture systems when waters become organically enriched resulting in bacterial blooms on which ciliates feed voraciously allowing for rapid population growth.

Developmental cycle and mode of transmission: These peritrichs are free-living ciliates occurring in aquatic habitats, but the feeding stages (trophonts or zooids) attach themselves directly or via stalks or loricae to solid substrates (the surfaces of inanimate objects, plants or animals) where they filter-feed. When conditions are suitable (abundant food, good water quality), the ciliates multiply asexually by binary fission involving the transverse splitting of trophonts into 2 daughter cells. Cell division may continue every few days allowing ciliate populations to grow exponentially. When food becomes scarce, some species initiate sexual reproduction by a unique process of conjugation where mating pairs involve the permanent fusion of a motile microconjugant with a sessile macroconjugant. Sexual reproduction enhances genetic diversity which is thought to promote the chances of survival of at least some offspring. The transmission of ciliates from one host to another is direct via water-borne stages. Some trophonts may detach from hosts in close contact or crowded conditions and subsequently reattach to new hosts. However, in adverse conditions (depleted food, poor water quality, mechanical disturbances), trophonts detach and form swarmer stages (telotrochs) which swim erratically in the water column seeking better substrates. Some species have also been observed to form resistant cysts to survive poor environmental conditions. Transmission of infestations between animal hosts is therefore direct via trophont transfer, via swarmers seeking new hosts, or via stages released from cysts.

Differential diagnosis: Infestations may be indicated by the visual detection of fouled carapaces or body surfaces, with the most conspicuous peritrich species appearing as slimy greenish colonies. However, many species are not green and do not form colonies, but heavy infestations by large numbers of solitary ciliates may cause minor disfigurement evident as discolourations, flecking and even some opacities. Infestations are confirmed by the microscopic detection of ciliates on specimens collected from live or dead hosts, including skin scrapings, fin snips, gill filaments, excised carapace sections, leg segments, or tissue fragments. Samples may be initially screened as wet mounts under the dissecting microscope looking for live ciliates as evidenced by active oral cilia or contractility of zooids and/or stalks. Specimens may then be collected by pipette and transferred to drops on glass slides and examined by compound light microscopy to reveal finer cellular details. Live ciliates are best observed using high-contrast bright-field, phase-contrast or interference-contrast microscopy, and counterstains may be used to reveal internal cellular details (e.g. methyl-green pyronin and methylene blue used to stain nuclei). Most genera can be identified by the morphological characteristics of the attachment apparatus (scopula, stalks, loricae), oral ciliation, pellicular adornments and nuclear configurations. However, specific identification is reliant on the silver impregnation of fixed specimens that have been enrobed onto albuminized slides and stained with silver proteinate (protargol), silver nitrate or silver carbonate to reveal the argentophilic basal bodies (kinetosomes), nuclei and pellicular striations. Researchers often use scanning electron microscopy to reveal topographical features or transmission electron microscopy to identify organelles and patterns of infraciliature. Free-living peritrichous species may be readily cultivated *in vitro* in a range of plant infusions or semi-defined media containing plentiful feeder bacteria, but those species only found in association with specific hosts and specific host tissues are difficult to maintain. Several *in vivo* animal models have been used experimentally to study particular ciliates, but not for long-term propagation. Molecular characterization studies initially used isoenzyme electrophoresis to profile several peritrichous species, but modern molecular biological techniques have now been used to characterize species and determine phylogenetic relationships following the polymerase chain reaction (PCR) amplification of nuclear gene sequences (mainly small subunit (18S) ribosomal DNA, and internal transcribed spacer regions).

Treatment and control: Infestations by peritrichous ciliates on fish or shellfish have been treated by washing fouled animals in clean water or by bathing them in hypo- or hyper-tonic solutions (e.g. freshwater baths for marine species and saltwater baths for freshwater species) or chemical solutions (including formalin, potassium permanganate, copper sulphate, malachite green). However, some treatments had adverse side-effects on the hosts and many of the chemicals are prohibited for use in food animals due to concerns over toxic residues. Various preventive measures have been used to reduce contamination by fouling organisms, particularly in closed aquaculture systems. Animals should be regularly inspected for biofouling, with affected animals removed for treatment, quarantine or culling. Tanks and ponds should be decontaminated by draining and drying or chemical disinfection. Peritrichous ciliates proliferate when bacteria are abundant so every effort should be made to reduce organic enrichment of holding facilities, including clearing overgrowth by aquatic plants and even grassy verges, avoiding over-feeding, and periodic flushing to remove accumulated wastes and prevent stagnation and eutrophication. It is also essential to keep animals healthy and avoid stressful (immunocompromising) situations that increase host susceptibility, such as over-crowding or over-handling stock, and not maintaining good water quality (temperature, pH, oxygenation).

Peritrichous ciliates



skin, gills
(unsightly fouling,
sometimes congestion)

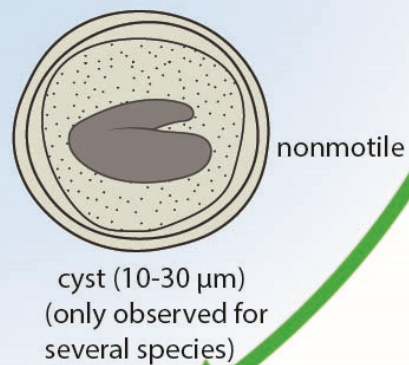
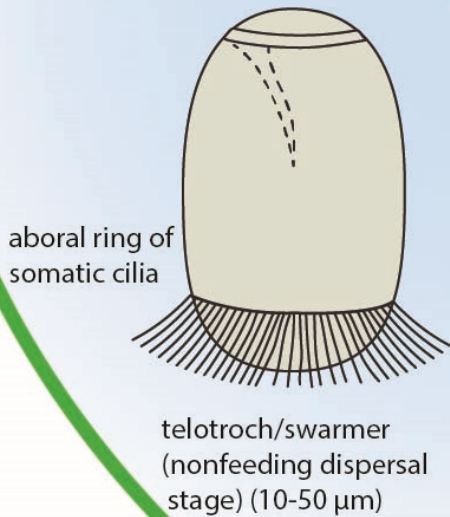
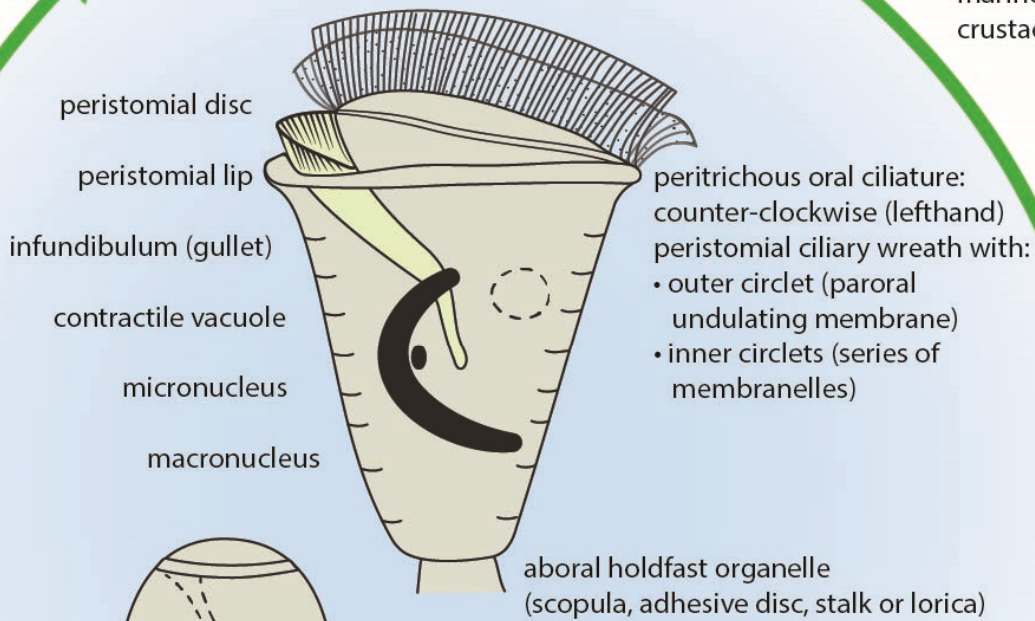
may reproduce asexually
(by transverse binary fission)
or sexually (by conjugation)

mostly free-living aquatic organisms that
opportunistically attach to host surfaces
as epizoic/ectocommensal organisms



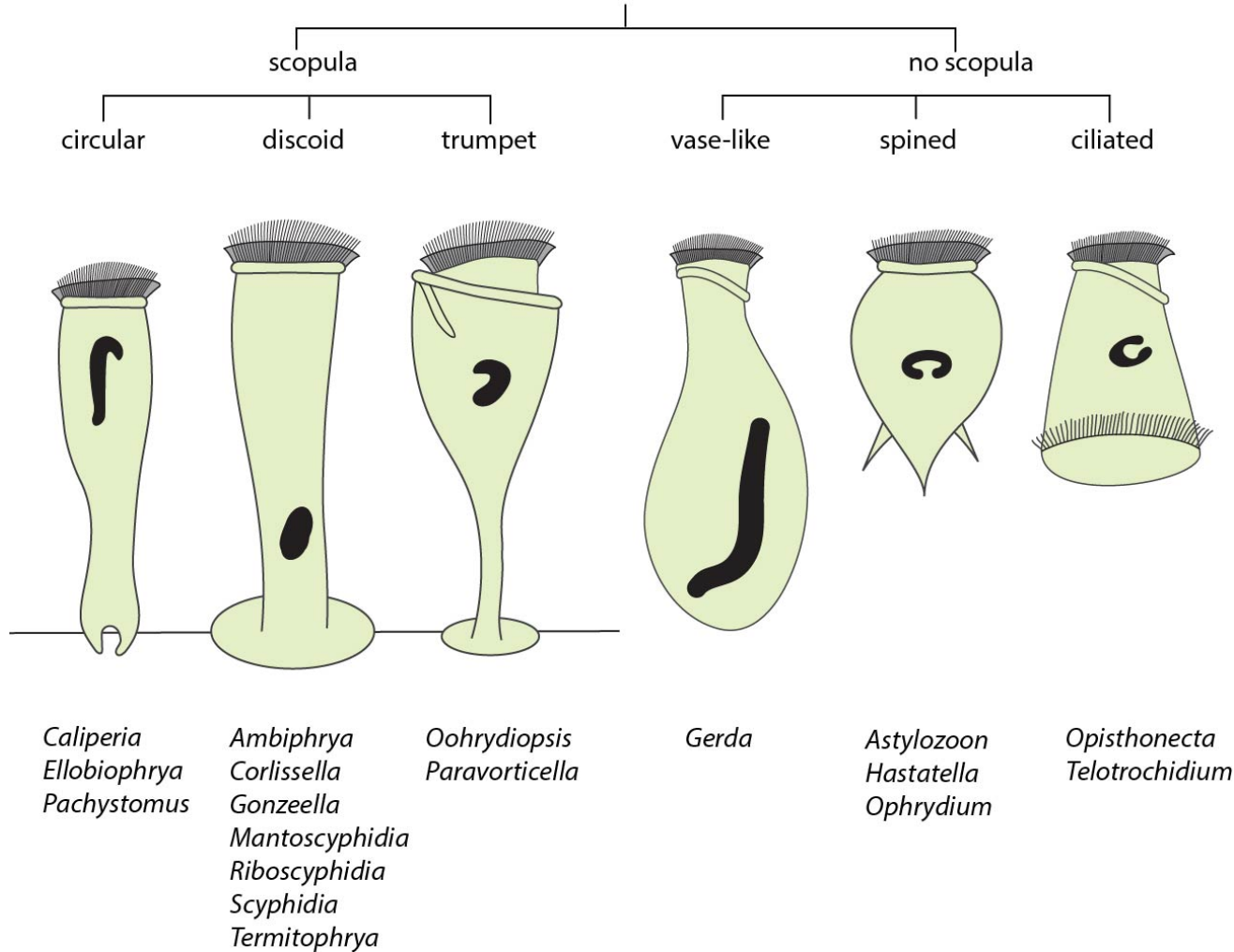
Vertebrate Hosts
(freshwater and
marine fish,
crustaceans)

sessile filter-feeding trophont/zoid
(10-80 μm) (stalked, stalkless or loricate)

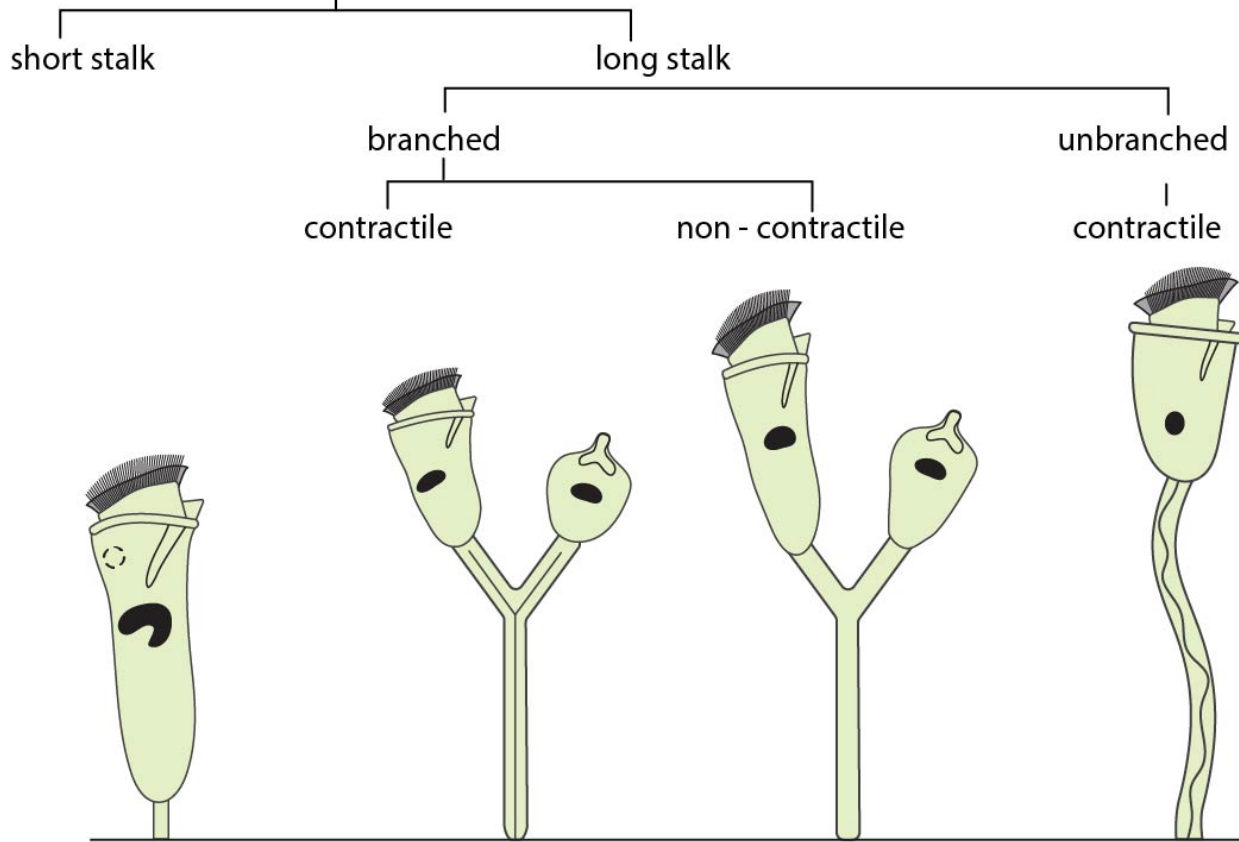


transmission via free-swimming swimmers in water column
attaching to substrates (incl. host surfaces)

stalkless peritrichs



stalked peritrichs



Apiosoma
Foissnerella
Orborhabdostyla
Rhabdostyla
Nuchterleinella
Ballodora
Orbopyxidiella
Propygidium
Triadopercularia

Carchesium
Entziella
Epicarchesium
Intrastylum
Pseudocarchesium
Rithiella
Craspedomyoschiston
Mesothamnum
Myoschiston
Zoothamniodes
Zoothamnum
Zoothamnopsis

Campanella
Epistylis
Heteropolaria
Pseudepistylis
Bezedniella
Opercularia
Operculariella
Orbopercularia
Systylis

Apocarchesium
Baikalonis
Baikalaster
Cotensita
Parazoothamnum
Pelagovorticella
Piesika
Planeticovorticella
Pseudovorticella
Spinivorticella
Tucolesca
Vorticella
Vorticellides
Haplocaulus
Pseudohaplocaulus

loricate peritrichs

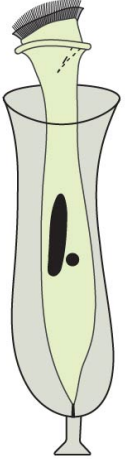
erect

lateral

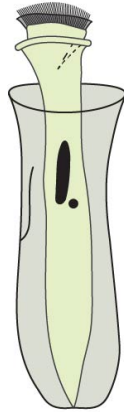
discoidal

stalk

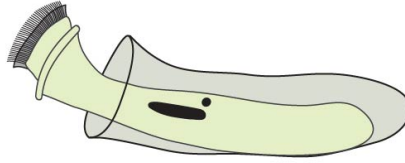
stalkless



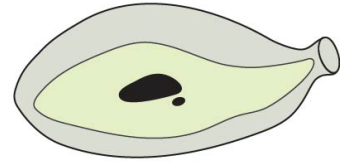
Cothurina
Cothurniopsis
Pyxicola
Triacola
Rovinjella
Cyclodonta
Grainis



Thuricola
Vaginicola



Platycola



Australana
Chilenophrys
Clistalagenophrys
Lagenophrys
Operculigera
Paralagenophrys
Setonophrys
Usconophrys



Epistylis zooids attached to yabby carapace



Vorticella zooids attached to yabby carapace



Lagenophrys loricae attached to yabby gill



Lagenophrys loricae attached to yabby gill (SEM)



Vaginicola loricae attached to yabby carapace



Vaginicola loricae attached to yabby carapace