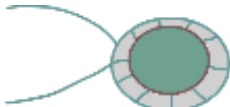

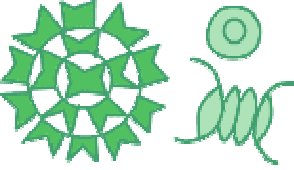

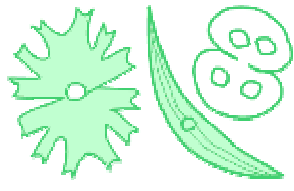
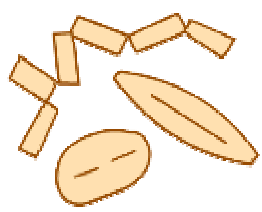
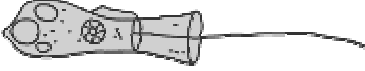

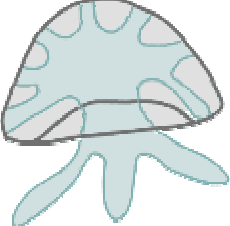
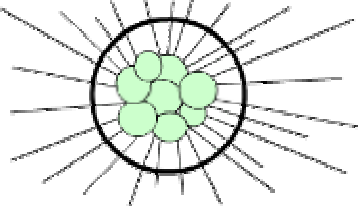
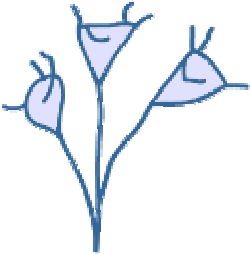
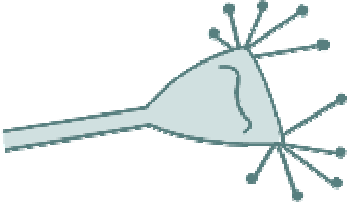


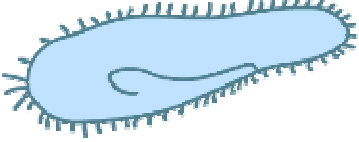

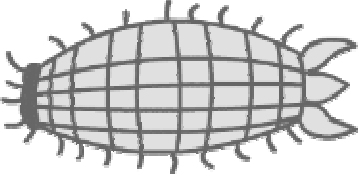
Guide to Identification of Fresh Water Microorganisms

Microscopic autotrophic organisms (i.e. algae)


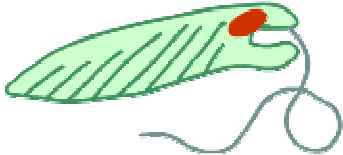
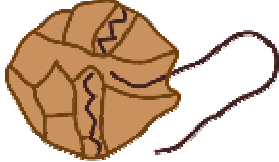


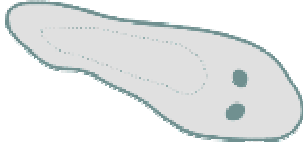
Name	Picture	Characteristic	Taxonomy
Green algae (with flagella, small) <.05 mm		<ol style="list-style-type: none"> 1. flagella 2. small 3. solitary 4. rapid movement 	Phylum Chlorophyceae i.e. <i>Chlamydomonas</i> sp.
Green algae (with flagella) .5-2mm		<ol style="list-style-type: none"> 1. spherical 2. colonial 3. with two flagella 	Phylum Chlorophyceae i.e. <i>Volvox</i> sp.
Green algae (no flagella) <.5 mm		<ol style="list-style-type: none"> 1. spherical to conical 2. not attached to surface 3. no movement 	Phylum Chlorophyceae i.e. <i>Pediastrum</i> sp.
Filamentous green algae <.1 mm – cms		<ol style="list-style-type: none"> 1. non branching chains of cells with chloroplast 3. no flagella 	Phylum Gamophyceae i.e. <i>Zygnema</i> sp. <i>Spirogyra</i> sp.
Desmids <.5 mm		<ol style="list-style-type: none"> 1. green 2. no flagella 3. mainly solitary, some colonial 4. various shapes 5. two semi-cell, mirror image 	Phylum Gamophyceae i.e. <i>Desmidium</i> sp. <i>Closterium</i> sp.
Diatoms <.5 mm		<ol style="list-style-type: none"> 1. one cell 2. slow gliding motion 3. solitary or colonial 4. cell wall (frustules) made of silica 	Phylum Bacillariophyceae i.e. Pennales, Centric

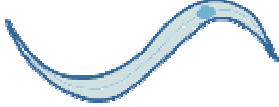


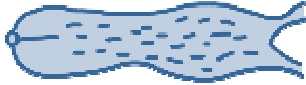
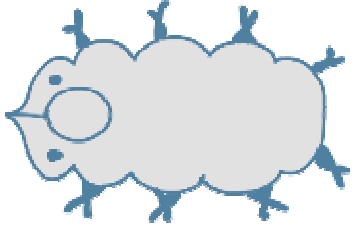
Protozoa – heterotrophic only

Name	Picture	Characteristic	Taxonomy
Flagellates <.5mm		<ol style="list-style-type: none"> 1. one or more flagella 2. colonial or free living 3. with or without lorica 	Zoomastigophora i.e choanoflagellates
Amoeba .02 –5 mm		<ol style="list-style-type: none"> 1. pseudopodia 2. slow movement 3. engulfs food 	Sacrodina Order Amoebina i.e. <i>Amoeba proteus</i>
Shelled Amoeba .1-.4 mm		<ol style="list-style-type: none"> 1. amoeba with a shell, usually sand grains 2. pseudopodia 3. slow movement 	Sacrodina Order Testacea i.e <i>Arcella</i> sp.
Heliozoans .01-1 mm		<ol style="list-style-type: none"> 1. spherical 2. radiating hair like pseudopods 3. no movement 	Sacrodina Order Heliozoa
Ciliates – Peritrich < .25 mm		<ol style="list-style-type: none"> 1. cylindrical or bell shaped bodies 2. undulating cilia 3. some stalked 4. often colonial 5. attached to different substrate 	Ciliophora Order Peritrichida i.e. <i>Vorticella</i> sp.
Ciliates – Suctoria <.7 mm		<ol style="list-style-type: none"> 1. no cilia, sticky tentacles <p>some attached to other organisms (i.e. <i>Suctoria</i>)</p>	Ciliophora Order Eridogenida i.e. <i>Tokophyra</i> sp.


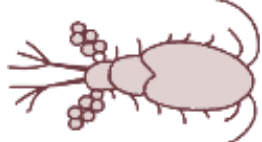
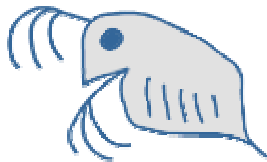

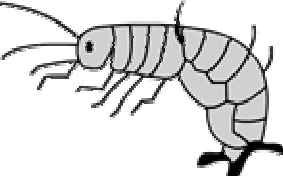

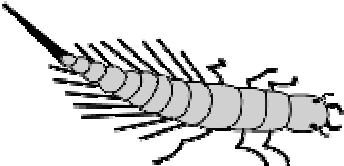

<p>Ciliates Paramecium .01 – 4mm</p>		<ol style="list-style-type: none"> 1. mostly free living forms 2. cell of fixed shape 3. movement by contraction and use of cilia 4. fixed mouth and anal pore 	<p>Ciliophora Order Oligohymenophorea i.e. <i>Paramecium</i> sp</p>
<p>Ciliates Stentor .01 – 4 mm</p>		<ol style="list-style-type: none"> 1. large body 2. contractile 3. cilia on mouth end 	<p>Ciliophora Order Heterotrichea i.e. <i>Stentor</i> sp.</p>
<p>Ciliates Coleps .01-4mm</p>		<ol style="list-style-type: none"> 1. barrel-shaped 2. spinous projection at posterior end 3. cytosome apical 	<p>Ciliophora Order Prostomatea i.e. <i>Coleps</i> sp.</p>

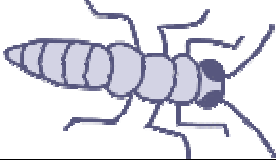

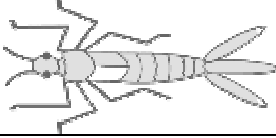
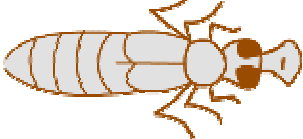
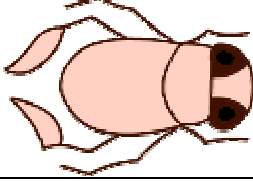
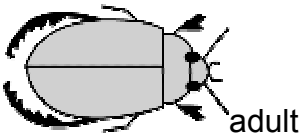


Other fresh water plankton (Animalia, Monera, etc)

Name	Picture	Characteristic	Taxonomy
Blue-green algae (cyanobacteria)		<ol style="list-style-type: none"> 1. blue green color 2. gliding movement 3. prokaryote 	Kingdom Monera i.e. <i>Annabella</i> sp.
Euglenoids <.4mm		<ol style="list-style-type: none"> 1. sometimes green 2. flagellate 3. red eye spot 	Phylum Euglenida i.e. <i>Euglena</i> sp.
Dinoflagellates <.4mm		<ol style="list-style-type: none"> 1. free swimming 2. tough armor 3. flagellate 4. autotrophic, heterotrophic 	Phylum Dinoflagellate
Rotifers .4mm - 2 cm		<ol style="list-style-type: none"> 1. corona with cilia 2. hairy appendages 3. transparent with lorica 4. free swimming or attached 5. organs, compressed body 	Phylum Rotifer Class Bdelloided Class Monogononta
Hydra 2 cm		<ol style="list-style-type: none"> 1. green brown or colorless 2. body and tentacles contract and stretch 3. primitive organs 	Phylum Cnidaria i.e. <i>Hydra</i> sp.
Flatworms 1-15+ mm		<ol style="list-style-type: none"> 1. flattened 2. eye spots 3. move in gliding motion 	Phylum Platyhelminthes Class Turbellaria i.e. <i>Planaria</i> sp.

<p>Roundworms .2-10 mm</p>		<ol style="list-style-type: none"> 1. moves in rapid "s" form 2. round body 3. bilateral 4. anterior, posterior openings 	<p>Phylum Nematodes</p>
<p>Oligochaetes 1.5 mm - >2 cm</p>		<ol style="list-style-type: none"> 1. segmented 2. worm motion 3. hair bundles (setae) 	<p>Phylum Annelida Class Oligochaeta</p>
<p>Leeches > 1 cm</p>		<ol style="list-style-type: none"> 1. predatory or parasitic 2. terminal suckers 3. hermaphroditic 	<p>Phylum Annelida Class Hirudinea</p>
<p>Gastrotricha .1-1.5mm</p>		<ol style="list-style-type: none"> 1. mainly benthic 2. head bristles 3. eat algae, bacteria, protozoa 	<p>Phylum Gastrotricha Order Chaetonotida</p>
<p>Tardigrades Little water bears < 1 mm</p>		<ol style="list-style-type: none"> 1. head and 4 trunk segments 2. 4 pair legs 3. eyes 4. herbivores 	<p>Phylum Tardigrada</p>

Arthropods - segmented, exoskeletons

Name	Picture	Characteristic	Taxonomy
Ostracods <2mm		<ol style="list-style-type: none"> 1. bean-like shell 2. filter feeders 3. bivalve carapace 	Class Crustacea Order Ostracoda i.e. <i>Cypris</i> sp.
Copepods .5-3mm		<ol style="list-style-type: none"> 1. long antennae 2. tiny eyespot 3. holoplankton 	Class Crustacea Order Copepoda
Water fleas .3-10mm		<ol style="list-style-type: none"> 1. antennae 2. large compound eye 3. holoplankton 	Class Crustacea Order Cladocera i.e. <i>Daphnia</i> sp
Isopods 5-20mm		<ol style="list-style-type: none"> 1. flattened 2. 7 pairs legs 3. scavengers 	Class Crustacea Order Isopoda
Amphipods 5-25mm		<ol style="list-style-type: none"> 1. curved 2. compressed body 3. humped back 4. scavengers 	Class Crustacea Order Amphipoda
Water mites .5-5mm		<ol style="list-style-type: none"> 1. 8 legs 2. round body 3. larvae (parasitic) 4. nymph looks like adult 	Class Arachnida Order Acarina
Alderfly nymph 5-25mm		<ol style="list-style-type: none"> 1. one tail 2. long filaments along the abdomen 3. meroplankton 	Class Insecta Order Megaloptera Family Sialidae
Caddisfly larva 3-40mm		<ol style="list-style-type: none"> 1. cylindrical case for protection 2. distinct case but different materials 	Class Insecta Order Trichoptera

Stonefly nymph <15 mm		<ol style="list-style-type: none"> 1. two jointed tails (cerci) 2. carnivorous 3. indicates clean water 	Class Insecta Order Plecoptera
Mayfly nymph <15mm		<ol style="list-style-type: none"> 1. three jointed tails 2. leaf-like gills on sides 	Class Insecta Order Ephemeroptera
Damselfly Nymph <15mm		<ol style="list-style-type: none"> 1. three leaf like tail appendages (gills) 2. extendable jaws 	Class Insecta Order Odonata Zygoptera
Dragonfly nymph <15mm		<ol style="list-style-type: none"> 1. robust 2. no tail appendages 3. extendable jaws 	Class Insecta Order Odonata Anisoptera
Water boatman nymph and adult 10-15mm		<ol style="list-style-type: none"> 1. no jaws 2. tube-like beak 3. nymphs don't have wings 	Class Insecta Order Hemiptera Family Corixidae
Water beetle <45mm	 adult	<ol style="list-style-type: none"> 1. strong jaws 2. tough shield 3. fierce predator 	Class Insecta Order Coleoptera Family Elmidae
	 nymph	<ol style="list-style-type: none"> 1. strong jaws 2. long segmented body 3. short legs 	
Mosquito larva 1-20 mm		<ol style="list-style-type: none"> 1. long slender body 2. moves in undulating s curves 	Class Insecta Order Diptera

Drawings redrawn from <http://www.microscopy-uk.org.uk/pond/index.html>