

Dactylogyrus

(platyhelminth: monogenea)

Overview

Platyhelminths have triploblastic acoelomate soft bodies which are markedly flattened in profile (hence their common name as flatworms). They undergo protostomial embryonic development but do not moult during growth. On the basis of molecular evidence, they are classified within the Lophotrochozoa despite the absence of lophophore mouthparts and trochophore larvae. Three classes are composed entirely of parasitic flatworms (Cestoda, Trematoda and Monogenea), which have prominent attachment organs (suckers or bothria), syncytial teguments, shell glands and vitellaria involved in ectolecithal egg development, and life-cycles involving a variety of larval stages. Monogeneans are elongate to oval flatworms that are ectoparasitic on the skin and gills of fish, although a few are found in the urinary tracts of turtles, frogs and fishes. They have an anterior adhesive organ (prohaptor) and a conspicuous posterior adhesive organ (opisthaptor) armed with hooks or spines, often highly modified for attachment to specific sites. They are hermaphroditic and have direct life-cycles mostly where eggs hatch releasing a free-swimming larva (oncomiracidium) which actively seeks a new host. Monopisthocotyleans have an opisthaptor that forms a single symmetrical attachment unit lacking haptoral clamps. Dactylogyrids are small short worms and the opisthaptor has two pairs of large ventral anchors and 14 small marginal hooks. Several *Dactylogyrus* spp. are serious pathogens of hatchery fish and heavy infestations of the gills may cause mortalities through blood loss and mucoid congestion.

Classification:

Domain: Eukaryota (membrane-bound nucleus)
Supergroup: Amorphea (unikonts with single flagellum, or nonflagellated amoebae)
Kingdom: Metazoa (multicellular eukaryotes, heterotrophs, notably animals)
Group: Protostomia (triploblastic, spiral cleavage)
Subgroup: Lophotrochozoa (lophophore feeding structure or trochophore larva or neither)
Phylum: Platyhelminthes (flatworms, acoelomate, most hermaphroditic, prominent attachment organs)
Clade: Neodermata (syncytial tegument = neodermis)
Class: Monogenea (monoxenous ectoparasites, sac-like gut, direct cycles, oncomiracidium with 3 ciliary bands)
Subclass: Monopisthocotylea (posterior haptor comprising a single symmetrical attachment unit, no haptoral clamps)
Order: Dactylogyridea (sperm with single axoneme, 12-14 haptoral hooks, 2 pairs anchors, 1 transverse bar)
Family: Dactylogyridae (posterior haptor, armed with hooks, oviparous)
Genus: *Dactylogyrus* (parasitic in gills of fish)
Species: various species cause respiratory signs in fish

Parasite biodiversity and host range: Most Metazoa are multicellular triploblastic animals with differentiated tissues, many being bilaterally symmetrical with a body cavity. Most invertebrate animals are protostomes as their embryonic development involves spiral determinate cleavage. Those that do not moult during their life-cycles are grouped together in the enigmatic clade Lophotrochozoa, including the platyhelminths, rotifers, lophophorates, annelids and molluscs. Platyhelminths (flatworms) have soft acoelomate flat bodies with three-dimensional arrays of muscles that generate a typical writhing motion (cf. longitudinal muscles in nematodes producing a thrashing motion). Flatworms do not have a single unifying characteristic (synapomorphy) but comprise diverse free-living (most Turbellaria) and parasitic (Neodermata) assemblages. Neodermata have non-ciliated syncytial (multinucleate) teguments and 3 classes are recognized, all with prominent attachment organs, namely, Cestoda with anterior bothridia/bothria (true/false suckers), Trematoda with oral and ventral suckers (previously called acetabula), and Monogenea with posterior haptors (opisthaptors). All have shell glands surrounding the ootype, and most exhibit ectolecithal egg development (yolk not present in egg but secreted by accessory glands called vitellaria or yolk glands). Most have indirect life-cycles involving the development of adult worms in vertebrates and larval stages in intermediate hosts (usually invertebrates).

Monogeneans and trematodes (flukes) have blind sac-like guts (lacking an anus) while cestodes (tapeworms) lack digestive tracts. Some 3,500 monogenean species have been described: most being ectoparasitic on the skin and gills of fish, although a few are found in the urinary tracts of turtles, frogs, fish and the eye of the hippopotamus. They have an anterior adhesive organ (prohaptor) and a conspicuous posterior adhesive organ (opisthaptor) armed with hooks, hooklets, hamuli (anchors) or clamps, often highly modified for attachment to specific sites. They are monoecious (hermaphroditic) and have direct monoxenous life-cycles mostly where eggs release free-swimming larvae (oncomiracidia with 3 ciliary bands) that actively seek new hosts (gyrodactylids are the exception as they are viviparous and produce live young). While the higher taxonomy of the Monogenea is often disputed with respect to rank, some 67 families have been resolved on the basis of morphological, biological and molecular studies. Three main groups are recognized: 28 families of Monopisthocotylea (opisthaptor with hooks, ectoparasitic on fish skin and gills, feed on epithelia); 37 families of Polyopisthocotylea (opisthaptor with clamps, ectoparasitic on fish gills, feed on blood); and 2 families of Polystomatoinea (opisthaptor with suckers, endoparasitic in tetrapods).

Order	No. families	No. spp.	DH	Characters
Class: Monogenea (= Monogenoidea) (monogenetic life-cycles, ectoparasitic mainly on fish) ~ 3,500 spp.				
Subclass: Monopisthocotylea (= Polyonchoinea) (opisthaptor with hooks, feed on fish epithelia) ~2,500 spp.				
Capsalidea	2	200	mostly marine teleosts, some elasmobranchs	2 anterior suckers, 2 pairs anchors, 14 marginal haptor hooks, some loculi
Dactylogyridea (= Monoaxonematidea)	17	1,000	freshwater and marine teleosts, coelacanth, squala	sperm with single axoneme, 12-14 haptor hooks, 2 pairs anchors, 1 transverse bar
Gyrodactylidea	5	1,500	freshwater and marine teleosts, squid, copepods	16 marginal 'hinged' haptor hooks, 1 pair anchors, dorsal and ventral bars, most viviparous (some nested polyembryony)
Monocotylidea	3	90	marine elasmobranchs	14 marginal haptor hooks, some loculi
Montchadskyellidea	1	10	marine teleosts	14 marginal haptor hooks, gut diverticulate, some endoparasitic in gut
Subclass: Polyopisthocotylea (= Heteronchoinea) (opisthaptor with clamps, most feed on blood of fish) ~1,000 spp.				
Chimaericolidea	1	5	marine holocephalans (chimaeras)	clamps, 1 pair anchors, haptor with 14 marginal hooks (each with domus)
Diclybothriidea	2	70	marine elasmobranchs, holocephalans, freshwater acipenseriform teleosts	clamps open and act as suckers, lateral sclerites absent
Mazocraeidea	34	920	numerous freshwater and marine teleost families	clamps with various structures incl. additional sclerites, hooks, spines; oral sucker a buccal organ, eggs with 2 polar filaments
Subclass: Polystomatoinea (parasitize aquatic tetrapods and lungfish)				
Polystomatidea	2	100	tetrapods (turtles, amphibians, hippopotamus), lungfish	haptor with 3 pairs suckers, egg filaments absent, some endoparasitic in tubular organs

Monopisthocotyleans have an opisthaptor that forms a single symmetrical attachment unit lacking haptor clamps. Five orders are recognized on the basis of differences in parasite morphology, development and host occurrence; including the order Dactylogyridea (= Monoaxonematidea) characterized mainly by worms producing sperm with a single axoneme. Over 1,000 species belonging to 17 dactylogyridean families (Amphibdellatidae, Ancylo-discoididae, Ancyrocephalidae (syn. Engraulitrematidae), Calceostomatidae, Dactylogyridae, Diplectanidae, Fridericianellidae, Iagotrematidae, Neocalceostomatidae, Neodactylo-discidae, Neotetraonchidae, Protogyrodactylidae, Pseudodactylogyridae, Pseudomurraytrematidae, Sundanonchidae, Tetraonchidae and Urogyridae) have been described from freshwater and marine teleosts (esp. cyprinids), coelacanth and some cartilaginous squalan sharks.

Members of the family Dactylogyridae are represented by small worms with a posterior haptor containing 2 pairs large ventral anchors and 14 small marginal hooks. They are oviparous and produce eggs which hatch to release a free-swimming ciliated larva (oncomiracidium) that actively seeks hosts. Almost 170 dactylogyrid genera have been described but there is little consensus as to collective groupings into subfamilies. Some studies recognized up to 10 dactylogyrid subfamilies on the basis of morphological, biological and preliminary single-locus molecular analyses, but subsequent multi-locus molecular studies found considerable variation between genera suggesting their para- or poly-phyletic origins. Recent parsimony analyses using multiple characters have identified 2 macroclades, one tentatively represented by the subfamily Dactylogyrinae (including the genus *Dactylogyrus* (syn. *Aplodiscus*, *Falciunguis*, *Gussevianus*, *Microncotrema*, *Microncotrematoides*, *Neodactylogyrus*, *Paradactylogyrus*, *Skrjabinonchus*)) but also containing another 20 genera previously assigned to other subfamilies. Clearly, further studies are required to determine phylogenetic relationships between members of this diverse family. The genus *Dactylogyrus* is speciose with over 900 species recorded mostly from the gills of freshwater fishes, particularly cyprinids.

<i>Dactylogyrus species</i>	Habitat	Hosts	Distribution
<i>D. absidatus</i>	freshwater	Cypriniformes: cyprinid (chub, bigeye chub)	North America
<i>D. acanthobramae</i>	freshwater	Cypriniformes: cyprinid (bleak)	Middle-East
<i>D. acanthobramis</i>	freshwater	Cypriniformes: cyprinid (bleak)	Middle-East
<i>D. acanthorhodei</i>	freshwater	Cypriniformes: cyprinid (bitterling)	Europe
<i>D. achmerowi</i>	freshwater	Cypriniformes: cyprinid (carp)	Eurasia
<i>D. achmerowianus</i>	freshwater	Cypriniformes: cyprinid (yellowcheek)	Asia
<i>D. acicularis</i>	freshwater	Cypriniformes: catostomid (redhorse)	North America
<i>D. aciculus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Asia
<i>D. acinacus</i>	freshwater	Cypriniformes: cyprinid (red garra)	Asia
<i>D. acrossocheili</i>	freshwater	Cypriniformes: cyprinid (minnow)	Asia
<i>D. acus</i>	freshwater	Cypriniformes: cyprinid (stoneroller, eastern shiner)	North America
<i>D. acutanchoratus</i>	freshwater	Cypriniformes: cyprinid (?)	China
<i>D. aegyptiacus</i>	marine	Atheriniformes: atherinid (silverside)	Africa
<i>D. aequipinnati</i>	freshwater	Cypriniformes: cyprinid (danio)	Asia
<i>D. afer</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. aferoides</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. affinis</i>	freshwater	Cypriniformes: cyprinid (barbel, bleak, white bream)	Eurasia, Africa
<i>D. afrobarbae</i>	freshwater	Cypriniformes: cyprinid (barbel), centrpomid (perch)	Africa
<i>D. afrochelatus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. afrofluviatilis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. afrolongicornis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. afropsilovaginus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. afroruahae</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. afrosclerovaginus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. afrotoxopous</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. agolumaccessorius</i>	freshwater	Cypriniformes: cyprinid (bigmouth shiner)	North America
<i>D. agopovae</i>	freshwater	Cypriniformes: cyprinid (riffle minnows)	Asia
<i>D. akaraicus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. alabamensis</i>	freshwater	Cypriniformes: cyprinid (bigeye chub)	North America
<i>D. alaeonchus</i>	freshwater	Cypriniformes: cyprinid (yellowfin)	Eurasia
<i>D. alatocirrus</i>	freshwater	Cypriniformes: cyprinid (redknife)	China
<i>D. alatoideus</i>	freshwater	Cypriniformes: cyprinid (yellowfin, sharpbelly)	Eurasia
<i>D. alatus</i>	freshwater	Cypriniformes: cyprinid (riffle minnows, bleak, sun bleak, asp, white bream, ide, chub, roach)	Eurasia
<i>D. albanicus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. albertensis</i>	freshwater	Cypriniformes: cyprinid (bigeye chub, flathead chub)	North America
<i>D. albori</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. allolongionchus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. amblops</i>	freshwater	Cypriniformes: cyprinid (bigeye chub)	North America
<i>D. amelliformis</i>	freshwater	Cypriniformes: cyprinid (bitterling)	China
<i>D. amieti</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. amphibothrium</i>	freshwater	Cypriniformes: cyprinid (tench, ide, chub); Perciformes: percid (ruffe)	Eurasia
<i>D. amplexicirrus</i>	freshwater	Cypriniformes: cyprinid (blackfish)	Asia
<i>D. amurensis</i>	freshwater	Cypriniformes: cyprinid (minnow)	Europe
<i>D. ancherythroculteri</i>	freshwater	Cypriniformes: cyprinid (minnow)	Asia
<i>D. anchoracanthus</i>	freshwater	Cypriniformes: cyprinid (chela, carp)	Indo-China
<i>D. anchoratus</i>	freshwater, marine	Cypriniformes: cyprinid (bream, minnow, riffle minnow, tench, scraper, barbel, carp, grass carp, Crucian carp, silver carp, gudgeon, sharpbelly, sun bleak, ide, chub, roach); Salmoniformes: salmonid (whitefish); Esociformes: esocid (pike); Gasterosteiformes: gasterosteid (sticklebacks)	Eurasia, North America
<i>D. anchoricirrus</i>	freshwater	Cypriniformes: cyprinid (?)	China
<i>D. ancistroides</i>	freshwater	Cypriniformes: cyprinid (smallscale yellowfin)	Asia

<i>D. ancyleus</i>	freshwater	Cypriniformes: cyprinid (lizard gudgeon)	Asia
<i>D. ancylostylus</i>	freshwater	Cypriniformes: cyprinid (river chub)	North America
<i>D. andalousiensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. angularis</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. annelus</i>	freshwater	Cypriniformes: cyprinid (bonelip)	Indo-China
<i>D. anylocirrus</i>	freshwater	Cypriniformes: cyprinid (Guichenot gidgeon)	Asia
<i>D. apogonis</i>	marine	Kurtiformes: apogonid (cardinalfish)	Japan
<i>D. apos</i>	freshwater	Cypriniformes: catostomid (hogsucker)	North America
<i>D. araxicus</i>	freshwater	Cypriniformes: cyprinid (scraper)	Eurasia
<i>D. archaeopenis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. arciformis</i>	freshwater	Cypriniformes: cyprinid (minnow)	Asia
<i>D. arcuatus</i>	freshwater	Cypriniformes: cyprinid (carp, crucian carp)	Eurasia
<i>D. arcus</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. argenteus</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. aristichthys</i>	freshwater	Cypriniformes: cyprinid (bighead carp, silver carp)	Asia
<i>D. asper</i>	freshwater	Cypriniformes: cyprinid (river chub)	North America
<i>D. aspili</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. assimovi</i>	freshwater	Cypriniformes: cobitid (stone loach)	Asia
<i>D. atlasensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. atratuli</i>	freshwater	Cypriniformes: cyprinid (riffle dace)	North America
<i>D. atripinnei</i>	freshwater	Cypriniformes: catostomid (redhorse)	North America
<i>D. atromaculatus</i>	freshwater	Cypriniformes: cyprinid (creek chub)	North America
<i>D. attenuatus</i>	freshwater	Cypriniformes: cyprinid (creek chub)	North America
<i>D. aureus</i>	freshwater	Cypriniformes: cyprinid (golden shiner); Percopsiformes: aphredoderid (pirate perch); Perciformes: centrarchid (warmouth bass)	North America
<i>D. auriculatus</i>	freshwater	Cypriniformes: cyprinid (carp, bream, white bream, tench, minnow, roach); Perciformes: percid (perch)	Eurasia, North America
<i>D. auriformis</i>	freshwater	Cypriniformes: cyprinid (smallscale yellowfin)	Asia
<i>D. austrosinensis</i>	freshwater	Cypriniformes: cyprinid (mahseer)	Asia
<i>D. aviformis</i>	freshwater	Cypriniformes: cyprinid (grey mullet)	Asia
<i>D. aviunguis</i>	freshwater	Cypriniformes: cyprinid (river chub)	North America
<i>D. babensis</i>	freshwater	Cypriniformes: cyprinid (carp, silver carp)	Asia
<i>D. bacailai</i>	freshwater	Cypriniformes: cyprinid (oxygaster)	Indo-China
<i>D. bakanensis</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. balistae</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. balkanicus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. banghami</i>	freshwater	Cypriniformes: cyprinid (lake chub, creek chub, silvery minnow, highscale shiner, redbreasted shiner, eastern shiner, riffle dace)	North America
<i>D. barbatuli</i>	freshwater	Cypriniformes: cobitid (stone loach)	Asia
<i>D. barbi</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. barbioides</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. barbui</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. barbuis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. barbus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. barbuisi</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. barisicirrus</i>	freshwater	Cypriniformes: cyprinid (minnow)	China
<i>D. barnae</i>	freshwater	Cypriniformes: cyprinid (barna baril)	India
<i>D. batae</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. batesii</i>	freshwater	Cyprinodontiformes: cyprinodontid (rivulines)	Africa
<i>D. bati</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. baueri</i>	freshwater	Cypriniformes: cyprinid (Crucian carp)	Europe
<i>D. beckeri</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. bellicae</i>	freshwater	Cypriniformes: cyprinid (bigeye chub, river chub)	North America
<i>D. belligobio</i>	freshwater	Cypriniformes: cyprinid (gudgeon)	China
<i>D. benhoussai</i>	freshwater	Cypriniformes: cyprinid (Algerian barbel)	Africa
<i>D. bialatus</i>	freshwater	Gobiiformes: gobiid (goby)	Asia
<i>D. bicornis</i>	freshwater	Cypriniformes: cyprinid (bitterling)	Eurasia
<i>D. bicurvitubus</i>	freshwater	Cypriniformes: cyprinid (labeo)	China
<i>D. bifidus</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. bifurcatus</i>	freshwater	Cypriniformes: cyprinid (bluntnose minnow)	North America

<i>D. binotati</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. biporosus</i>	freshwater	Cypriniformes: cyprinid (Amur bream)	Asia
<i>D. birgii</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. bispiralis</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. biwaensis</i>	freshwater	Cypriniformes: cyprinid (carp)	Eurasia
<i>D. boaiensis</i>	freshwater	Cypriniformes: cyprinid (ink carp)	China
<i>D. bocageii</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. boli</i>	freshwater	Cypriniformes: cyprinid (trout barb)	Africa, Asia
<i>D. boopsi</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. bopeleti</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. borealis</i>	freshwater	Cypriniformes: cyprinid (minnow)	Europe
<i>D. borjensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. bovicornutus</i>	freshwater	Cypriniformes: cyprinid (redwing fish)	Asia
<i>D. brachius</i>	freshwater	Cypriniformes: cyprinid (sharpbelly)	Asia
<i>D. brachydiscus</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. branchialis</i>	freshwater	Cypriniformes: cyprinid (redknife)	China
<i>D. brevicardus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. brevicirrus</i>	freshwater	Cypriniformes: cyprinid (barbel, minnow, black 'shark')	Eurasia, Africa
<i>D. brevicornis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. brevifurcatus</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. brevitignus</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. brevitubus</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. bucephalophoroides</i>	freshwater	Cypriniformes: cyprinid (minnow)	Asia
<i>D. bucinus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. buddi</i>	freshwater	Scorpaeniformes: cottid (sculpin)	North America
<i>D. bulbus</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. bullosus</i>	freshwater	Cypriniformes: cyprinid (highscale shiner, eastern shiner)	North America
<i>D. bului</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. bychowskyii</i>	freshwater	Cypriniformes: cyprinid (riffle minnows, bluntnose minnow)	North America, Asia
<i>D. caballeroi</i>	freshwater	Cypriniformes: cyprinid (roach)	Eurasia
<i>D. caecus</i>	freshwater	Cypriniformes: cyprinid (ide, chub)	Eurasia
<i>D. calbasi</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. californiensis</i>	freshwater	Cypriniformes: cyprinid (pikeminnow)	North America
<i>D. calyciformis</i>	freshwater	Cypriniformes: cyprinid (thicklip gudgeon)	Asia
<i>D. capoetae</i>	freshwater	Cypriniformes: cyprinid (scraper)	Asia
<i>D. capoetobramae</i>	freshwater	Cypriniformes: cyprinid (sharpray)	Asia
<i>D. carassioides</i>	freshwater	Cypriniformes: cyprinid (blackfish)	Asia
<i>D. carassobarbi</i>	freshwater	Cypriniformes: cyprinid (himris)	Asia
<i>D. carmeli</i>	freshwater	Cypriniformes: cyprinid (bleak)	Middle-East
<i>D. carolinensis</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. carpathicus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. catlaius</i>	freshwater	Cypriniformes: cyprinid (Indian carp, black 'shark')	Asia
<i>D. caucasicus</i>	freshwater	Cypriniformes: cyprinid (riffle minnows)	Asia
<i>D. caudoluminis</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. cauveryi</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. centrarchidi</i>	freshwater	Perciformes: centrarchid (warmouth bass)	North America
<i>D. ceratoides</i>	freshwater	Cypriniformes: cyprinid (barbel)	Asia
<i>D. cernyi</i>	freshwater	Cypriniformes: cyprinid (river chub)	North America
<i>D. chagunionis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. chalcalburni</i>	freshwater	Cypriniformes: cyprinid (riffle minnows, bleak, barbel chub, mullet)	Asia
<i>D. changjiangensis</i>	freshwater	Cypriniformes: cyprinid (danio)	China
<i>D. charbinensis</i>	freshwater	Cypriniformes: cyprinid (barbel chub)	Asia
<i>D. chauhani</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. chelicirrus</i>	freshwater	Cypriniformes: cyprinid (grey mullet)	Asia
<i>D. cheligenitalis</i>	freshwater	Cypriniformes: cyprinid (bonelip)	Indo-China
<i>D. cheloideus</i>	freshwater	Cypriniformes: cyprinid (riffle dace)	North America
<i>D. chenchihleui</i>	freshwater	Cypriniformes: cyprinid (barbel chub, redknife)	Asia

<i>D. cheni</i>	freshwater, marine	Gobiiformes: gobiid (goby)	Asia
<i>D. chenjiagengi</i>	freshwater	Cypriniformes: cyprinid (jaw beard)	China
<i>D. chenminjungae</i>	freshwater	Cypriniformes: cyprinid (topmouth culter, redknife, sharpbelly)	Asia
<i>D. chenshuchena</i>	freshwater	Cypriniformes: cyprinid (silver carp)	Asia
<i>D. chenyezhinae</i>	freshwater	Cypriniformes: cyprinid (barbel chub)	Asia
<i>D. chernyshevae</i>	freshwater	Cypriniformes: cyprinid (yellowfin)	Eurasia
<i>D. chinensis</i>	freshwater	Cypriniformes: cyprinid (barbel chub)	Asia
<i>D. chini</i>	freshwater	Cypriniformes: cyprinid (sharpbelly)	Asia
<i>D. chinyejiangensis</i>	freshwater	Cypriniformes: cyprinid (barb)	China
<i>D. chishuiensis</i>	freshwater	Cypriniformes: cyprinid (?)	China
<i>D. chitravanshii</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. chondrostomi</i>	freshwater	Cypriniformes: cyprinid (white bream, nase)	cosmopolitan
<i>D. chongqingensis</i>	freshwater	Cypriniformes: cyprinid (rosy bitterling)	Japan
<i>D. chramulii</i>	freshwater	Cypriniformes: cyprinid (scraper)	Eurasia
<i>D. chraniłowi</i>	freshwater	Cypriniformes: cyprinid (bream, white bream, bleak, crucian carp)	cosmopolitan
<i>D. chrosomi</i>	freshwater	Cypriniformes: cyprinid (minnow)	Europe
<i>D. ciliensis</i>	freshwater	Cypriniformes: cyprinid (cultrine)	Asia
<i>D. cincinatus</i>	freshwater	Cypriniformes: cyprinid (scraper)	Asia
<i>D. circumflexus</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. circumphallus</i>	freshwater	Cypriniformes: cyprinid (chela)	India
<i>D. cirrhini</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. clani</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. clasterocirrus</i>	freshwater	Cypriniformes: cyprinid (ink carp)	China
<i>D. clavaeformis</i>	freshwater	Cypriniformes: cyprinid (sharpbelly)	Asia
<i>D. clavatovaginus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. claviformis</i>	freshwater	Cypriniformes: cyprinid (creek chub)	North America
<i>D. clypeatus</i>	freshwater	Cypriniformes: cyprinid (jaw beard)	China
<i>D. coarctatus</i>	freshwater	Cypriniformes: cyprinid (tricolor sharkminnow)	Asia
<i>D. colonus</i>	freshwater	Scorpaeniformes: cottocomephorid (deepwater sculpins)	Europe
<i>D. colpodes</i>	freshwater	Cypriniformes: cyprinid (jaw beard)	China
<i>D. columbiensis</i>	freshwater	Cypriniformes: cyprinid (pikeminnow)	North America
<i>D. comizae</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. concavusiformis</i>	freshwater	Cypriniformes: cyprinid (mahseer)	Asia
<i>D. condylus</i>	freshwater	Cypriniformes: cyprinid (percocypris carp)	Asia
<i>D. confusus</i>	freshwater	Cypriniformes: cyprinid (dace, eastern shiner)	North America
<i>D. contortus</i>	freshwater	Cypriniformes: cyprinid (redknife)	China
<i>D. contrarmatus</i>	freshwater	Cypriniformes: cyprinid (bonelip)	Indo-China
<i>D. convolvugentalis</i>	freshwater	Cypriniformes: cyprinid (bonelip)	Indo-China
<i>D. cordus</i>	freshwater	Cypriniformes: cyprinid (bleak, ide, chub)	Eurasia, North America
<i>D. coreiusi</i>	freshwater	Cypriniformes: cyprinid (gudgeon)	China
<i>D. cornoides</i>	freshwater	Cypriniformes: cyprinid (vimba bream, white bream)	Europe
<i>D. cornu</i>	freshwater, marine	Cypriniformes: cyprinid (bream, white bream, bleak, mahseer, vimba bream, barbel, nase, kingfish, ide, chub, roach, rudd), silurid (catfish), mugilid (mullet)	Eurasia, Middle-East
<i>D. cornucirrus</i>	freshwater	Cypriniformes: cyprinid (carp)	Eurasia
<i>D. cornutus</i>	freshwater	Cypriniformes: cyprinid (silverjaw minnow, eastern shiner)	North America
<i>D. corporalis</i>	freshwater	Cypriniformes: cyprinid (creek chub)	North America
<i>D. cotius</i>	freshwater	Cypriniformes: cyprinid (rohtee)	India
<i>D. cranoglanis</i>	freshwater	Siluriformes: bagrid (armorhead catfish)	China
<i>D. crassus</i>	freshwater	Cypriniformes: cyprinid (carp, crucian carp)	Eurasia
<i>D. crescenticleithrium</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. cristatocleithrium</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. cristatus</i>	freshwater	Cypriniformes: cyprinid (gudgeon)	Europe
<i>D. crivellius</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa

<i>D. crossocheili</i>	freshwater	Cypriniformes: cyprinid (mudcarp)	Asia
<i>D. crucifer</i>	freshwater	Cypriniformes: cyprinid (carp, bream, white bream, bleak, vimba bream, ide, chub, roach, rudd), esocid (pike)	Eurasia
<i>D. crucis</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. crucitrabus</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. cryptomeres</i>	freshwater	Cypriniformes: cyprinid (barbel, gudgeon)	Eurasia, Africa
<i>D. ctenopharyngodonis</i>	freshwater	Cypriniformes: cyprinid (grass carp)	Eurasia, North America
<i>D. curiosus</i>	freshwater	Cypriniformes: cyprinid (rasbora)	Asia
<i>D. curriculi</i>	freshwater	Cypriniformes: cyprinid (barbel chub)	Asia
<i>D. cursitans</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. curvicirrus</i>	freshwater	Cypriniformes: cyprinid (topmouth culter, redknife)	Asia
<i>D. cyathus</i>	freshwater	Cypriniformes: cyprinid (rectoris)	Asia
<i>D. cyclocirrus</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. cymbidioides</i>	freshwater	Cypriniformes: cyprinid (minnow)	Asia
<i>D. cymtiformis</i>	freshwater	Cypriniformes: cyprinid (redwing fish)	China
<i>D. cyprini</i>	freshwater	Cypriniformes: cyprinid (carp, koi carp)	Eurasia
<i>D. cyprinioni</i>	freshwater	Cypriniformes: cyprinid (kingfish)	Asia
<i>D. cystovagina</i>	freshwater	Cypriniformes: cyprinid (ink carp)	China
<i>D. czerskii</i>	freshwater	Cypriniformes: cyprinid (minnow)	Europe
<i>D. dachuanensis</i>	freshwater	Cypriniformes: cyprinid (tchangi)	China
<i>D. daliensis</i>	freshwater	Cypriniformes: cyprinid (snowtrout)	China
<i>D. daniconii</i>	freshwater	Cypriniformes: cyprinid (rasbora)	Asia
<i>D. daojiensis</i>	freshwater	Cypriniformes: cyprinid (flying fox)	Asia
<i>D. decaspirus</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. delicatus</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. dembae</i>	freshwater	Cypriniformes: cyprinid (African carp)	Africa
<i>D. denticulati</i>	freshwater	Cypriniformes: cyprinid (barbel, spiny barbel)	Asia
<i>D. deziensioides</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. deziensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. difformis</i>	freshwater	Cypriniformes: cyprinid (carp, bream, white bream, ide, chub, roach, rudd)	Eurasia
<i>D. difformoides</i>	freshwater	Cypriniformes: cyprinid (rudd)	Eurasia
<i>D. digitalis</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. digitiformis</i>	freshwater	Cypriniformes: cyprinid (Chinese lizard gudgeon)	Asia
<i>D. dimitrovae</i>	freshwater	Cypriniformes: cyprinid (riffle minnows, bleak)	Asia
<i>D. dirigerus</i>	freshwater	Cypriniformes: cyprinid (nase)	Europe
<i>D. dissimili</i>	freshwater	Cypriniformes: cyprinid (bigeye chub)	North America
<i>D. distinctus</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. distinguendus</i>	freshwater	Cypriniformes: cyprinid (bream, vimba bream, white bream, ide, chub, rudd)	Eurasia
<i>D. distoechodoni</i>	freshwater	Cypriniformes: cyprinid (redwing fish)	Asia
<i>D. doadrioi</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. dogieli</i>	freshwater	Cypriniformes: cyprinid (Crucian carp)	Europe
<i>D. dolus</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. dominici</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. dorsalis</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. draaensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. drjagini</i>	freshwater	Cypriniformes: cyprinid (osman, snowtrout)	Asia
<i>D. dubii</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. dubius</i>	freshwater	Cypriniformes: cyprinid (eastern shiner, creek chub)	North America
<i>D. dujardinianus</i>	freshwater	Cypriniformes: cyprinid (bream, bleak, carp, crucian carp, ide, chub, roach)	Eurasia
<i>D. dulkeiti</i>	freshwater	Cypriniformes: cyprinid (Crucian carp)	Europe
<i>D. duplus</i>	freshwater	Cypriniformes: cyprinid (barbel chub)	Asia
<i>D. duquesni</i>	freshwater	Cypriniformes: catostomid (redhorse)	North America
<i>D. dyki</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. editus</i>	freshwater	Cypriniformes: cyprinid (false osman)	China
<i>D. effusus</i>	freshwater	Cypriniformes: cyprinid (river chub)	North America

<i>D. egregius</i>	freshwater	Cypriniformes: cyprinid (redside shiner)	North America
<i>D. ehrenbergii</i>	freshwater	Cypriniformes: cyprinid (?)	China
<i>D. eigenmanni</i>	freshwater	Cypriniformes: cyprinid (sharpbelly)	Asia
<i>D. elegantis</i>	freshwater	Cypriniformes: cyprinid (nase)	Europe
<i>D. elongatus</i>	freshwater	Cypriniformes: cyprinid (carp, ide, chub)	Eurasia
<i>D. emeiheensis</i>	freshwater	Cypriniformes: cyprinid (yellowfin)	Eurasia
<i>D. enidae</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. eos</i>	freshwater	Cypriniformes: cyprinid (dace, minnow)	North America, Europe
<i>D. epalzeorhynchus</i>	freshwater	Cypriniformes: cyprinid (flying fox)	Asia
<i>D. ergensi</i>	freshwater	Cypriniformes: cyprinid (nase)	Europe
<i>D. erhaiensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Asia
<i>D. erhardovae</i>	freshwater	Cypriniformes: cyprinid (roach)	Eurasia
<i>D. ericymbae</i>	freshwater	Cypriniformes: cyprinid (silverjaw minnow)	North America
<i>D. ersinensis</i>	freshwater	Cypriniformes: cyprinid (osman, minnow)	Eurasia
<i>D. erythroculteris</i>	freshwater	Cypriniformes: cyprinid (redknife)	China
<i>D. erythropteris</i>	freshwater	Cypriniformes: cyprinid (topmouth culter, redknife)	Asia
<i>D. erythropteroides</i>	freshwater	Cypriniformes: cyprinid (kanglang)	China
<i>D. eslamii</i>	freshwater	Cypriniformes: cyprinid (Gangetic latia)	India
<i>D. eucalius</i>	freshwater	Gasterosteiformes: gasterosteid (sticklebacks)	North America
<i>D. euryanceps</i>	freshwater	Cypriniformes: cyprinid (scaly fish)	China
<i>D. exiguus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Asia
<i>D. extensus</i>	freshwater	Cypriniformes: cyprinid (carp, bighead carp, crucian carp, koi carp, barbel, ide, chub), cobitid (weather loach); Perciformes: centrarchid (black bass)	North America, Asia
<i>D. facetus</i>	freshwater	Cypriniformes: cyprinid (pseudogoby, lizard gudgeon)	Asia
<i>D. falcatus</i>	freshwater	Cypriniformes: cyprinid (carp, bream, white bream, sharpray, roach, lizard gudgeon)	Eurasia
<i>D. falciformis</i>	freshwater	Cypriniformes: cyprinid (carp)	Eurasia
<i>D. falcilocus</i>	freshwater	Cypriniformes: cyprinid (scraper, barbel, black 'shark')	Eurasia
<i>D. falciunguis</i>	freshwater	Cypriniformes: cyprinid (white bream)	Asia
<i>D. fallax</i>	freshwater	Cypriniformes: cyprinid (carp, sabre carp, bream, white bream, bleak, tench, ide, chub, roach, rudd); Gobiiformes: gobiid (tubenose goby)	Eurasia
<i>D. falsiphallus</i>	freshwater	Cypriniformes: cyprinid (Maghreb barbel)	Africa
<i>D. faridpaki</i>	freshwater	Cypriniformes: cyprinid (Gangetic latia)	India
<i>D. fasciati</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. fasciculi</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. fasciola</i>	freshwater	Cypriniformes: cyprinid (Lagowski's minnow)	Asia
<i>D. fenghuaensis</i>	freshwater	Cypriniformes: cyprinid (minnow)	Asia
<i>D. fernandoi</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. fileicirrus</i>	freshwater	Cypriniformes: cyprinid (ink carp)	China
<i>D. fimbriphallus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. finitimus</i>	freshwater	Cypriniformes: cyprinid (bleak, gudgeon)	Palaearctic
<i>D. fistuliformis</i>	freshwater	Cypriniformes: cyprinid (lizard gudgeon)	Asia
<i>D. flagellatus</i>	freshwater	Cypriniformes: cyprinid (redknife, sharpbelly, bonelip)	Asia
<i>D. flagellicirrus</i>	freshwater	Cypriniformes: cyprinid (minnow, topmouth culter, redknife, sharpbelly)	Asia
<i>D. flagristylus</i>	freshwater	Cypriniformes: cyprinid (river chub)	North America
<i>D. flammulatus</i>	freshwater	Cypriniformes: cyprinid (silverfish)	Asia
<i>D. flexianchoratus</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. flexibilis</i>	freshwater	Cypriniformes: cyprinid (river chub)	North America
<i>D. flexiformis</i>	freshwater	Cypriniformes: cyprinid (striped minnow)	Asia
<i>D. floracirrus</i>	freshwater	Cypriniformes: cyprinid (redknife)	China
<i>D. fluvialis</i>	freshwater	Cypriniformes: cyprinid (pseudogoby)	Asia
<i>D. foliacirrus</i>	freshwater	Cypriniformes: cyprinid (redknife, sharpbelly)	Asia
<i>D. folkmanovae</i>	freshwater	Cypriniformes: cyprinid (ide, chub, roach)	Eurasia

<i>D. forcipatus</i>	freshwater	Cypriniformes: cyprinid (bitterling)	Europe
<i>D. formosus</i>	freshwater	Cypriniformes: cyprinid (crucian carp, carp)	Eurasia
<i>D. fotedari</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. fragilis</i>	freshwater	Cypriniformes: cyprinid (redknife)	China
<i>D. fraternus</i>	freshwater	Cypriniformes: cyprinid (bleak, sun bleak, ide, chub, roach, rudd)	Eurasia, North America
<i>D. frisii</i>	freshwater	Cypriniformes: cyprinid (ide, chub, roach)	Eurasia
<i>D. fulcrum</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. fungulus</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. furcatus</i>	freshwater	Cypriniformes: cyprinid (bonelip)	Indo-China
<i>D. furcellatus</i>	freshwater	Cypriniformes: cyprinid (minnow)	Asia
<i>D. fustis</i>	freshwater	Cypriniformes: cyprinid (bonelip)	Indo-China
<i>D. gabonensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. galilensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. garrae</i>	freshwater	Cypriniformes: cyprinid (mudcarp, red garra)	Asia
<i>D. geei</i>	freshwater	Cypriniformes: cyprinid (Crucian carp)	Europe
<i>D. gemellus</i>	freshwater	Cypriniformes: cyprinid (bream, ide, chub, roach)	Eurasia
<i>D. gemmicirrus</i>	freshwater	Cypriniformes: cyprinid (?)	China
<i>D. georgiensis</i>	freshwater	Cypriniformes: cyprinid (stoneroller)	North America
<i>D. gigihamatus</i>	freshwater	Cypriniformes: cyprinid (percocypris carp)	Asia
<i>D. glossogobii</i>	freshwater, marine	Gobiiformes: gobiid (goby)	Africa, Australia
<i>D. gnathopogonis</i>	freshwater	Cypriniformes: cyprinid (jaw beard, longnose gudgeon)	China
<i>D. gobii</i>	freshwater	Cypriniformes: cyprinid (gudgeon)	Europe
<i>D. gobiocypris</i>	freshwater	Cypriniformes: cyprinid (rare minnow)	China
<i>D. gobioninum</i>	freshwater	Cypriniformes: cyprinid (gudgeon, pseudogoby, lizard gudgeon), alestid (tigerfish)	Africa, Asia
<i>D. goktschaicus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. gotoi</i>	marine	Perciformes: percichthyid (seabass)	Asia
<i>D. gracilis</i>	freshwater	Characiformes: alestid (tigerfish)	Africa
<i>D. graciliuncinatus</i>	freshwater	Cypriniformes: cyprinid (bream)	Eurasia
<i>D. grandicirrus</i>	freshwater	Cypriniformes: cyprinid (doty barbel)	Korea
<i>D. greenei</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. grislaginis</i>	freshwater	Cypriniformes: cyprinid (ide, chub)	Eurasia
<i>D. guadianensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. guangxiensis</i>	freshwater	Cypriniformes: cyprinid (lizard gudgeon)	Asia
<i>D. gudaoensis</i>	freshwater, marine	Gobiiformes: gobiid (goby)	Asia
<i>D. guirensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. guizhouensis</i>	freshwater	Cypriniformes: cyprinid (blackfish, lizard gudgeon)	Asia
<i>D. gussevi</i>	freshwater	Cypriniformes: cyprinid (yellowcheek, redknife)	Asia
<i>D. gvosdevi</i>	freshwater	Cypriniformes: cyprinid (minnow)	Europe
<i>D. gyrocirrus</i>	freshwater	Cypriniformes: cyprinid (ink carp)	China
<i>D. hainanensis</i>	freshwater	Cypriniformes: cyprinid (false halfknife)	Asia
<i>D. hamatus</i>	freshwater	Cypriniformes: catostomid (hogsucker, redhorse)	North America
<i>D. hankinsoni</i>	freshwater	Cypriniformes: cyprinid (silvery minnow)	North America
<i>D. haplogonoides</i>	freshwater	Cypriniformes: cyprinid (vimba bream, ide, chub)	Eurasia
<i>D. haplogonus</i>	freshwater	Cypriniformes: cyprinid (vimba bream, mullet, ide, chub, roach)	Eurasia
<i>D. harmandi</i>	freshwater	Cypriniformes: cyprinid (silver carp)	Asia
<i>D. hauyingensis</i>	freshwater	Cypriniformes: cyprinid (yellowfin)	Eurasia
<i>D. hejiangensis</i>	freshwater	Cypriniformes: cyprinid (?)	China
<i>D. helicoides</i>	freshwater	Cypriniformes: cyprinid (pseudogyrinocheilid)	China
<i>D. helicoidus</i>	freshwater	Cypriniformes: cyprinid (cherry barb)	Asia
<i>D. helicophallus</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. helictocirrus</i>	freshwater	Cypriniformes: cyprinid (topmouth culter)	Asia
<i>D. hemiamphibothrium</i>	freshwater	Perciformes: percid (ruffe, perch)	Eurasia
<i>D. hemibarbi</i>	freshwater	Cypriniformes: cyprinid (doty barbel)	Korea
<i>D. hemiculteris</i>	freshwater	Cypriniformes: cyprinid (sharpbelly)	Asia
<i>D. hemipetaloides</i>	freshwater	Cypriniformes: cyprinid (false halfknife)	Asia
<i>D. hemiphysodes</i>	freshwater	Cypriniformes: cyprinid (thornside)	China
<i>D. hemitermedioides</i>	freshwater	Cypriniformes: cyprinid (blackfish)	Asia

<i>D. hemitremiae</i>	freshwater	Cypriniformes: cyprinid (chub)	North America
<i>D. hemivolutus</i>	freshwater	Cypriniformes: cyprinid (yellowfin)	Eurasia
<i>D. heterolepis</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. heteromorphus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. hirundinis</i>	freshwater	Cypriniformes: cyprinid (minnow)	Asia
<i>D. hirundinoides</i>	freshwater	Cypriniformes: cyprinid (scraper)	Eurasia
<i>D. holciki</i>	freshwater	Cypriniformes: cyprinid (mullet)	Asia
<i>D. hovorkai</i>	freshwater	Cypriniformes: cyprinid (carp)	Eurasia
<i>D. huhangensis</i>	freshwater	Cypriniformes: cyprinid (thicklip gudgeon)	Asia
<i>D. hui</i>	freshwater	Cypriniformes: cyprinid (yellowfin)	Eurasia
<i>D. hybognathus</i>	freshwater	Cypriniformes: cyprinid (silvery minnow)	North America
<i>D. hyderabadensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. hydrophloxi</i>	freshwater	Cypriniformes: cyprinid (rough shiner)	North America
<i>D. hypophthalmichthys</i>	freshwater	Cypriniformes: cyprinid (bighead carp, silver carp)	Asia
<i>D. idus</i>	freshwater	Cypriniformes: cyprinid (ide)	Europe
<i>D. imberbis</i>	freshwater	Cypriniformes: cyprinid (jaw beard)	China
<i>D. indicus</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. inexpectatus</i>	freshwater	Cypriniformes: cyprinid (Crucian carp, grass carp)	Europe
<i>D. insolitus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. intermedioides</i>	freshwater	Cypriniformes: cyprinid (Crucian carp)	Europe
<i>D. intermedius</i>	freshwater	Cypriniformes: cyprinid (carp, crucian carp); Esociformes: esocid (pike)	Eurasia
<i>D. intestinalis</i>	freshwater	Cypriniformes: cyprinid (sharpray)	Asia
<i>D. inutilis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. inversus</i>	marine	Scombriformes: scombrid (mackerel); Perciformes: percichthyid (seabass)	Eurasia
<i>D. iridescens</i>	freshwater	Cypriniformes: cyprinid (minnow)	Asia
<i>D. irinae</i>	freshwater	Cypriniformes: cyprinid (false osman)	China
<i>D. iskanderensis</i>	freshwater	Cypriniformes: cyprinid (barbel, roach, cherry barb)	Eurasia, Africa
<i>D. ivanovici</i>	freshwater	Cypriniformes: cyprinid (Albanian roach)	Europe
<i>D. iwani</i>	freshwater	Cypriniformes: cyprinid (moggel, Orange River mudfish)	Africa
<i>D. izjumovae</i>	freshwater	Cypriniformes: cyprinid (ide, chub, rudd)	Eurasia
<i>D. jaculus</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. jaei</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. jaini</i>	freshwater	Cypriniformes: cyprinid (silverjaw minnow)	North America
<i>D. jainisachali</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. jamansajensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. jiangjingensis</i>	freshwater	Cypriniformes: cyprinid (Guichenot's gudgeon)	China
<i>D. jiayuensis</i>	freshwater	Cypriniformes: cyprinid (bleak, yellowfin)	Middle-East, Eurasia
<i>D. jubbstrema</i>	freshwater, marine	Gobiiformes: gobiid (goby)	Africa, Australia
<i>D. joriensis</i>	freshwater	Cypriniformes: cyprinid (riffle minnows)	Asia
<i>D. jucundus</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. jukhimenkoi</i>	freshwater	Cypriniformes: cyprinid (white bream)	Asia
<i>D. julieae</i>	freshwater	Cypriniformes: cyprinid (silverjaw minnow)	North America
<i>D. jullieni</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. junchisi</i>	freshwater	Cypriniformes: cyprinid (yellowfin)	Eurasia
<i>D. juveniformis</i>	freshwater	Cypriniformes: cyprinid (yellowfin)	Eurasia
<i>D. kalyanensis</i>	freshwater	Cypriniformes: cyprinid (Indian carp)	Asia
<i>D. kamang</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. kanchanaburiensis</i>	freshwater	Cypriniformes: cyprinid (cherry barb)	Asia
<i>D. katherineae</i>	freshwater	Cypriniformes: cyprinid (stoneroller)	North America
<i>D. kendalanicus</i>	freshwater	Cypriniformes: cyprinid (scraper)	Eurasia
<i>D. kersini</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. kii</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. kikuchii</i>	marine	Perciformes: percichthyid (seabass)	Asia
<i>D. knobihamatus</i>	freshwater	Cypriniformes: cyprinid (barbel chub)	Asia
<i>D. kontii</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. kritskyi</i>	freshwater	Cypriniformes: cyprinid (hitch)	North America

<i>D. ksibii</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. ksibioides</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. kulindrii</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. kulwieci</i>	freshwater	Cypriniformes: cyprinid (barbel, ide, chub)	Eurasia, Africa
<i>D. kunminensis</i>	freshwater	Cypriniformes: cyprinid (kanglang)	China
<i>D. kurematsui</i>	freshwater	Cypriniformes: cyprinid (minnow)	Asia
<i>D. kurenkowi</i>	freshwater	Cypriniformes: cyprinid (minnow, three-lips)	Asia
<i>D. kwainensis</i>	freshwater	Cypriniformes: cyprinid (cherry barb)	Asia
<i>D. labei</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. labeous</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. labiatus</i>	freshwater	Siluriformes: bagrid (armorhead catfish)	China
<i>D. lachneri</i>	freshwater	Cypriniformes: cyprinid (river chub)	North America
<i>D. lali</i>	freshwater, marine	Gobiiformes: gobiid (goby)	Africa, Australia
<i>D. lamellatus</i>	freshwater	Cypriniformes: cyprinid (mahseer, barbel, carp, grass carp, black carp)	Asia
<i>D. lampam</i>	freshwater	Cypriniformes: cyprinid (cherry barb)	Asia
<i>D. lanka</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. laokajensis</i>	freshwater	Cypriniformes: cyprinid (scraper)	Eurasia
<i>D. larindae</i>	freshwater	Cypriniformes: cyprinid (moggel, Orange River mudfish)	Africa
<i>D. larrymilleri</i>	freshwater	Cypriniformes: cyprinid (greenhead shiner, yellowfin shiner)	North America
<i>D. lateolabracis</i>	marine	Perciformes: percichthyid (seabass)	Asia
<i>D. latihamatus</i>	freshwater	Cypriniformes: cyprinid (Guichenot's gudgeon)	China
<i>D. latirictus</i>	freshwater	Cypriniformes: cyprinid (river chub)	North America
<i>D. latituba</i>	freshwater	Cypriniformes: cyprinid (kingfish, sharpbelly)	Asia
<i>D. laymani</i>	freshwater	Cypriniformes: cyprinid (Crucian carp)	Europe
<i>D. laymanianus</i>	freshwater	Cypriniformes: cyprinid (thicklip gudgeon)	Asia
<i>D. lebedevi</i>	freshwater	Cypriniformes: cyprinid (lizard gudgeon)	Asia
<i>D. leewanweii</i>	freshwater	Cypriniformes: cyprinid (three-lips)	China
<i>D. legionensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. lenkorani</i>	freshwater	Cypriniformes: cyprinid (scraper)	Eurasia
<i>D. lenkoranoides</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. leonis</i>	freshwater	Cypriniformes: cyprinid (African carp)	Africa
<i>D. lepidus</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. leptobarbus</i>	freshwater	Cypriniformes: cyprinid (mad barb)	Asia
<i>D. leptosiphonius</i>	freshwater	Cypriniformes: cyprinid (redwing fish)	Asia
<i>D. leptostylus</i>	freshwater	Cypriniformes: cyprinid (river chub)	North America
<i>D. leshanensis</i>	freshwater	Cypriniformes: cyprinid (pseudogyroncheilid)	China
<i>D. leucisci</i>	freshwater	Cypriniformes: cyprinid (ide, chub)	Eurasia
<i>D. leucisculus</i>	freshwater	Cypriniformes: cyprinid (sharpbelly)	Asia
<i>D. liangshiyani</i>	freshwater	Cypriniformes: cyprinid (sharpbelly)	Asia
<i>D. lianshanensis</i>	freshwater	Cypriniformes: cyprinid (garra)	Asia
<i>D. liaohoensis</i>	freshwater	Cypriniformes: cyprinid (bitterling)	Europe
<i>D. limaciformis</i>	freshwater	Cypriniformes: cyprinid (rectoris)	Asia
<i>D. limae</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. limleehongae</i>	freshwater	Cypriniformes: cyprinid (yellowfin, nase)	Eurasia
<i>D. limulus</i>	freshwater	Cypriniformes: cyprinid (bigeye chub, river chub)	North America
<i>D. lindbergi</i>	freshwater	Cypriniformes: gyroncheilid (sucking loach)	Asia
<i>D. lineatus</i>	freshwater	Cypriniformes: cyprinid (creek chub)	North America
<i>D. lingualis</i>	freshwater	Cypriniformes: cyprinid (red garra)	Asia
<i>D. linstowi</i>	freshwater	Cypriniformes: cyprinid (barbel, snowtrout)	Eurasia, Africa
<i>D. linstowoides</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. lishuiensis</i>	freshwater	Cypriniformes: cyprinid (redwing fish)	Asia
<i>D. lohanii</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. longiacus</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. longicirrus</i>	freshwater	Cypriniformes: cyprinid (mahseer, barbel, cherry barb, topmouth culter, carp, snowtrout)	Asia
<i>D. longicopula</i>	freshwater	Cypriniformes: cyprinid (barbel, snowtrout)	Eurasia, Africa
<i>D. longilamenatus</i>	freshwater	Cypriniformes: cyprinid (spikyhead carp)	Asia
<i>D. longionchus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa

<i>D. longiphalloides</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. longiphallus</i>	freshwater	Cypriniformes: cyprinid (barbel, black 'shark')	Eurasia, Africa
<i>D. longissimus</i>	freshwater	Cypriniformes: cyprinid (redknife)	China
<i>D. longituba</i>	freshwater	Cypriniformes: cyprinid (barb)	Asia
<i>D. longivagina</i>	freshwater	Cypriniformes: cyprinid (topmouth culter)	Asia
<i>D. longquanensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Asia
<i>D. longsoi</i>	freshwater	Cypriniformes: cyprinid (barbel chub)	Asia
<i>D. lophogonus</i>	freshwater	Cypriniformes: cyprinid (bitterling)	Eurasia
<i>D. lopuchinae</i>	freshwater	Cypriniformes: cyprinid (carp)	Eurasia
<i>D. loricirrus</i>	freshwater	Cypriniformes: cyprinid (yellowfin)	Eurasia
<i>D. luciosomis</i>	freshwater	Cypriniformes: cyprinid (shark minnow)	Asia
<i>D. lumpycirrus</i>	freshwater	Cypriniformes: cyprinid (Tarim schizothoracin)	China
<i>D. luxili</i>	freshwater	Cypriniformes: cyprinid (golden shiner, eastern shiner)	North America
<i>D. mabianensis</i>	freshwater	Cypriniformes: cyprinid (minnow)	Asia
<i>D. macracanthus</i>	freshwater	Cypriniformes: cyprinid (tench); Perciformes: percoid (ruffe)	Eurasia
<i>D. macrocleithrum</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. macrocolpius</i>	freshwater	Cypriniformes: cyprinid (tricolor sharkminnow)	Asia
<i>D. macroformis</i>	freshwater	Cypriniformes: cyprinid (barb)	China
<i>D. macrogaster</i>	freshwater	Siluriformes: clariid (catfish)	India
<i>D. macrostomi</i>	freshwater	Cypriniformes: cyprinid (kingfish)	Asia
<i>D. maculatus</i>	freshwater	Cypriniformes: cyprinid (riffle dace)	North America
<i>D. magnibulbus</i>	freshwater	Cypriniformes: cyprinid (longnose shiner, orangefin shiner)	North America
<i>D. magnicirrus</i>	freshwater	Cypriniformes: cyprinid (barbel chub)	Asia
<i>D. magnicordus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. magnicystocirrus</i>	freshwater	Cypriniformes: cyprinid (cherry barb)	Asia
<i>D. magnihamatus</i>	freshwater	Cypriniformes: cyprinid (bighead carp, crucian carp, grass carp, silver carp, black carp, topmouth culter, redknife, sharpbelly, Amur bream, white bream, danio, three-lips)	Asia
<i>D. magnolium</i>	freshwater	Cypriniformes: cyprinid (grey mullet)	Asia
<i>D. magnus</i>	freshwater	Cypriniformes: cyprinid (bigeye chub)	North America
<i>D. maillardi</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. malayanus</i>	freshwater	Cypriniformes: cyprinid (bonelip)	Indo-China
<i>D. malewitskajae</i>	freshwater	Cypriniformes: cyprinid (minnow)	Europe
<i>D. malleolus</i>	freshwater	Cypriniformes: cyprinid (river chub)	North America
<i>D. malleus</i>	freshwater	Cypriniformes: cyprinid (asp, barbel, ide, chub)	Eurasia
<i>D. manairensis</i>	freshwater	Synbranchiformes: mastacembelid (spiny eel)	Asia
<i>D. manicatus</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. mantschuricus</i>	freshwater	Cypriniformes: cyprinid (barbel chub)	Asia
<i>D. markewitschi</i>	freshwater	Cypriniformes: cyprinid (gudgeon, lizard gudgeon, pseudogoby)	Asia
<i>D. marocanus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. martinovici</i>	freshwater	Cypriniformes: cyprinid (roach)	Europe
<i>D. mascomai</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. mawli</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. maximus</i>	freshwater	Cypriniformes: cyprinid (thicklip gudgeon)	Asia
<i>D. megastoma</i>	freshwater	Cypriniformes: cyprinid (carp, white bream, bitterling)	Eurasia, Americas
<i>D. megastylus</i>	freshwater	Cypriniformes: cyprinid (river chub)	North America
<i>D. megatuba</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. melanopteri</i>	freshwater	Cypriniformes: cyprinid (tricolour sharkminnow)	Asia
<i>D. mendehei</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. meridionalis</i>	freshwater	Cypriniformes: cyprinid (bleak, roach), cobitid (stone loach)	Asia
<i>D. merus</i>	freshwater	Cypriniformes: cyprinid (minnow)	Europe
<i>D. micracanthus</i>	freshwater	Cypriniformes: cyprinid (bleak, ide, chub, roach, rudd)	Eurasia, North America
<i>D. microcirrus</i>	freshwater	Cypriniformes: cyprinid (scraper)	Asia

<i>D. microdontoides</i>	freshwater	Cypriniformes: cyprinid (lizard gudgeon)	Asia
<i>D. microlepidotus</i>	freshwater	Cypriniformes: cyprinid (hitch, blackfish)	North America
<i>D. microphallus</i>	freshwater	Cypriniformes: cyprinid (creek chub)	North America
<i>D. micropogoni</i>	freshwater	Cypriniformes: cyprinid (river chub)	North America
<i>D. microtheloides</i>	freshwater	Cypriniformes: cyprinid (doty barbel)	Korea
<i>D. mikailovi</i>	freshwater	Cypriniformes: cyprinid (scraper, barbel, ide, chub)	Eurasia
<i>D. millieae</i>	freshwater	Cypriniformes: cyprinid (river chub)	North America
<i>D. minjiangensis</i>	freshwater	Cypriniformes: cyprinid (pseudogyrinocheilid)	China
<i>D. minor</i>	freshwater	Cypriniformes: cyprinid (bleak, sun bleak, white bream, mullet, carp)	Eurasia, North America
<i>D. minutus</i>	freshwater	Cypriniformes: cyprinid (bream, white bream, bleak, asp, carp, koi carp)	Eurasia
<i>D. mississippiensis</i>	freshwater	Cypriniformes: cyprinid (river chub)	North America
<i>D. mizellei</i>	freshwater	Cyprinodontiformes: poeciliid (swordtail)	North America
<i>D. mobedii</i>	freshwater	Cypriniformes: cyprinid (morari)	Middle-East
<i>D. modestus</i>	freshwater	Cypriniformes: cyprinid (bleak, tench, carp, snowtrout)	Eurasia, North America
<i>D. molitorelli</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. mollis</i>	freshwater	Cypriniformes: cyprinid (bleak, tench, carp)	Eurasia, North America
<i>D. molnari</i>	freshwater	Cypriniformes: cyprinid (carp)	Eurasia
<i>D. mongolicus</i>	freshwater	Cypriniformes: cyprinid (redknife)	China
<i>D. monocornis</i>	freshwater	Cypriniformes: cyprinid (tench)	Eurasia
<i>D. montschadskyi</i>	freshwater	Cypriniformes: cyprinid (topmouth culter, redknife, sharpbelly)	Asia
<i>D. moorei</i>	freshwater	Cypriniformes: cyprinid (bigeye chub, eastern shiner)	North America
<i>D. moorthyi</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. moximui</i>	freshwater	Cypriniformes: cyprinid (dusky barbel)	China
<i>D. mrazeki</i>	freshwater	Cypriniformes: cyprinid (carp)	Eurasia
<i>D. mrigali</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. mursae</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. muscariformis</i>	freshwater	Cypriniformes: cyprinid (biglip gudgeon)	China
<i>D. myersi</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. mylocheilus</i>	freshwater	Cypriniformes: cyprinid (lake chub, peamouth chub)	North America
<i>D. nanocirrus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. nanoides</i>	freshwater	Cypriniformes: cyprinid (ide, chub)	Eurasia
<i>D. nanus</i>	freshwater	Cypriniformes: cyprinid (bream, white bream, bleak, scraper, ide, chub, roach, thicklip gudgeon)	Eurasia
<i>D. nasalis</i>	freshwater	Cypriniformes: cyprinid (white bream, roach, rudd)	Eurasia
<i>D. narimani</i>	freshwater	Cypriniformes: cyprinid (riffle minnows)	Asia
<i>D. narzikulovi</i>	freshwater	Cypriniformes: cyprinid (scraper)	Eurasia
<i>D. nasali</i>	freshwater	Cypriniformes: cyprinid (black carp)	Asia
<i>D. nathaliae</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. navarroensis</i>	freshwater	Cypriniformes: cyprinid (roach)	North America
<i>D. navicularis</i>	freshwater	Cypriniformes: cyprinid (thicklip gudgeon)	Asia
<i>D. naviculoides</i>	freshwater	Cypriniformes: cyprinid (ide, chub)	Eurasia
<i>D. neoparvus</i>	freshwater	Cypriniformes: cyprinid (riffle minnows)	Asia
<i>D. newensis</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. nicolletae</i>	freshwater	Cypriniformes: cyprinid (moggel, Orange River mudfish)	Africa
<i>D. niedashui</i>	freshwater	Cypriniformes: cyprinid (minnow)	Asia
<i>D. niger</i>	freshwater	Cypriniformes: catostomid (redhorse)	North America
<i>D. nikolskyi</i>	freshwater	Cypriniformes: cyprinid (minnow, sharpbelly)	Asia
<i>D. nobilis</i>	freshwater	Cypriniformes: cyprinid (bighead carp, grass carp, silver carp)	Asia
<i>D. nuchalis</i>	freshwater	Cypriniformes: cyprinid (silvery minnow)	North America
<i>D. nuntuis</i>	freshwater	Cypriniformes: cyprinid (bigeye chub, eastern shiner)	North America
<i>D. nybelini</i>	freshwater	Cypriniformes: cyprinid (nase, roach)	Europe

<i>D. nyongensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. oblongus</i>	freshwater	Cypriniformes: cyprinid (bitterling)	Eurasia
<i>D. obscurus</i>	freshwater	Cypriniformes: cyprinid (topmouth gudgeon)	Asia
<i>D. occidentalis</i>	freshwater	Cypriniformes: cyprinid (roach)	North America
<i>D. olfactorius</i>	freshwater	Cypriniformes: cyprinid (fathead minnow)	North America
<i>D. oligospirophallus</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. omega</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. omeiensis</i>	freshwater	Cypriniformes: cyprinid (bitterling)	China
<i>D. omenti</i>	freshwater	Cypriniformes: cyprinid (Balkan barbelgudgeon)	Europe
<i>D. onychoaccessorius</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. onychocirrus</i>	freshwater	Cypriniformes: cyprinid (red garra)	Asia
<i>D. onychorhini</i>	freshwater	Cypriniformes: cyprinid (scraper)	Eurasia
<i>D. oodeus</i>	freshwater	Cypriniformes: cyprinid (doty barbel)	Korea
<i>D. opsopoeodi</i>	freshwater	Cypriniformes: cyprinid (pugnose minnow)	North America
<i>D. orbus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. orchis</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. oreoleucisci</i>	freshwater	Cypriniformes: cyprinid (osman)	Asia
<i>D. orientalis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. ornatus</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. ornithopodus</i>	freshwater	Cypriniformes: cyprinid (yellowfin, smallscale yellowfin, sharpbelly)	Eurasia
<i>D. ornithorrhynchus</i>	freshwater	Cypriniformes: cyprinid (yellowfin, smallscale yellowfin, topmouth culter, redknife)	Eurasia
<i>D. orphoidi</i>	freshwater	Cypriniformes: cyprinid (cherry barb)	Asia
<i>D. orthodon</i>	freshwater	Cypriniformes: cyprinid (blackfish)	North America
<i>D. oryziasi</i>	freshwater	Beloniformes: adrianichthyid (medaka)	Asia
<i>D. osculus</i>	freshwater	Cypriniformes: cyprinid (riffle dace)	North America
<i>D. osmanovi</i>	freshwater	Cypriniformes: cyprinid (bream, carp, grass carp, ide, chub)	Eurasia
<i>D. osteochili</i>	freshwater	Cypriniformes: cyprinid (bonelip)	Indo-China
<i>D. ostraviensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. oumiensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. pahangensis</i>	freshwater	Cypriniformes: cyprinid (cherry barb)	Asia
<i>D. pakistanensis</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. pallens</i>	freshwater	Cypriniformes: cyprinid (snowtrout)	China
<i>D. palliatus</i>	freshwater	Cypriniformes: cyprinid (Amur bream, white bream)	Asia
<i>D. pallicirrus</i>	freshwater	Cypriniformes: cyprinid (kingfish)	Asia
<i>D. pamirensis</i>	freshwater	Cypriniformes: cyprinid (false osman)	China
<i>D. panchinpeii</i>	freshwater	Cypriniformes: cyprinid (barbel chub)	Asia
<i>D. pandus</i>	freshwater	Cypriniformes: cyprinid (jaw beard)	China
<i>D. pani</i>	freshwater	Cypriniformes: cyprinid (kanglang)	China
<i>D. pannosus</i>	freshwater	Cypriniformes: cyprinid (sharpbelly)	Asia
<i>D. papernai</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. papillus</i>	freshwater	Cypriniformes: cyprinid (bitterling)	Eurasia
<i>D. parabramis</i>	freshwater	Cypriniformes: cyprinid (Amur bream, white bream)	Asia
<i>D. paracanthrobrama</i>	freshwater	Cypriniformes: cyprinid (thornside)	China
<i>D. paracurvituboides</i>	freshwater	Cypriniformes: cyprinid (sharpbelly)	Asia
<i>D. paracymbidioides</i>	freshwater	Cypriniformes: cyprinid (yellowfin)	Eurasia
<i>D. paradinosaurinus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Asia
<i>D. paradoxus</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. parahastatus</i>	freshwater	Cypriniformes: cyprinid (redknife)	China
<i>D. parahirundinus</i>	freshwater	Cypriniformes: cyprinid (scraper)	Eurasia
<i>D. parapeleci</i>	freshwater	Cypriniformes: cyprinid (minnow)	Asia
<i>D. parapterocleidus</i>	freshwater	Cypriniformes: cyprinid (topmouth culter)	Asia
<i>D. parawaldronii</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. partipentazonae</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. parvaccessorius</i>	freshwater	Cypriniformes: cyprinid (bigeye chub)	North America
<i>D. parvianchoris</i>	freshwater	Cypriniformes: cyprinid (chela)	India
<i>D. parvibulbus</i>	freshwater	Cypriniformes: cyprinid (highscale shiner, weed)	North America

		shiner)	
<i>D. parvicirrus</i>	freshwater	Cypriniformes: cyprinid (golden shiner, roach)	North America, Eurasia
<i>D. parviphallus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. parvisarcocheilichthysi</i>	freshwater	Cypriniformes: cyprinid (thicklip gudgeon)	Asia
<i>D. parvus</i>	freshwater	Cypriniformes: cyprinid (riffle minnow, bleak, ide, chub)	Eurasia
<i>D. pavlovskiyi</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. pectenatus</i>	freshwater	Cypriniformes: cyprinid (bluntnose minnow)	North America
<i>D. pectinate</i>	freshwater	Cypriniformes: cyprinid (mahseer)	Asia
<i>D. peculiaris</i>	freshwater	Cypriniformes: cyprinid (sharpbelly)	Asia
<i>D. pekinensis</i>	freshwater	Cypriniformes: cyprinid (Amur bream, white bream)	Asia
<i>D. pedunculatus</i>	freshwater	Cypriniformes: cyprinid (rasbora)	Asia
<i>D. pellucidus</i>	freshwater	Cypriniformes: cyprinid (redknife)	China
<i>D. peltatus</i>	freshwater	Cypriniformes: cyprinid (topmouth culter, redknife)	Asia
<i>D. pentabrachiatus</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. pentabrachicleithrium</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. perakensis</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. percobromus</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. percocypris</i>	freshwater	Cypriniformes: cyprinid (percocypris carp)	Asia
<i>D. perlus</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. persis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. petaloideus</i>	freshwater	Cypriniformes: cyprinid (smallscale yellowfin)	Asia
<i>D. petenyi</i>	freshwater	Cypriniformes: cyprinid (Danubian barbel, Romanian barbel)	Europe
<i>D. petitjeanii</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. petkovici</i>	freshwater	Cypriniformes: cyprinid (barbel, roach)	Eurasia, Africa
<i>D. petruschewskyi</i>	freshwater	Cypriniformes: cyprinid (Amur bream, white bream, silverfish)	Asia
<i>D. petticoatus</i>	freshwater	Cypriniformes: cyprinid (bitterling)	Europe
<i>D. pharyngocephalus</i>	freshwater, marine	Gobiiformes: gobiid (goby)	Africa, Australia
<i>D. photogenis</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. phoxini</i>	freshwater	Cypriniformes: cyprinid (carp, osman, minnow)	Eurasia
<i>D. phymatachilus</i>	freshwater	Cypriniformes: cyprinid (danio)	China
<i>D. pienaar</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. pinleensis</i>	freshwater	Cypriniformes: cyprinid (discogoby)	Asia
<i>D. placentiformis</i>	freshwater	Cypriniformes: cyprinid (scraper)	Eurasia
<i>D. plegadus</i>	freshwater	Cypriniformes: cyprinid (bigeye chub)	North America
<i>D. pleioschizopetalus</i>	freshwater	Cypriniformes: cyprinid (redknife)	China
<i>D. plumbeus</i>	freshwater	Cypriniformes: catostomid (redhorse)	North America
<i>D. pokoase</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. pollens</i>	freshwater	Cypriniformes: cyprinid (snowtrout)	China
<i>D. pollex</i>	freshwater	Cypriniformes: cyprinid (highscale shiner, eastern shiner)	North America
<i>D. polycheiroadactylus</i>	freshwater	Cypriniformes: cyprinid (yellowfin)	Eurasia
<i>D. polylepidis</i>	freshwater	Cypriniformes: cyprinid (nase, ide, chub)	Eurasia
<i>D. prespensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. primarius</i>	freshwater	Cypriniformes: cyprinid (minnow, three-lips)	Asia
<i>D. procypr</i>	freshwater	Cypriniformes: cyprinid (ink carp)	China
<i>D. pronatus</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. propinquus</i>	freshwater	Cypriniformes: cyprinid (bream, vimba bream)	Eurasia
<i>D. proprius</i>	freshwater	Cypriniformes: cyprinid (sharpbelly)	Asia
<i>D. prostae</i>	freshwater	Cypriniformes: cyprinid (ide, chub)	Eurasia
<i>D. protozysron</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. pseudanchoratus</i>	freshwater	Cypriniformes: cyprinid (scraper, barbel, black 'shark')	Eurasia
<i>D. pseudasp</i>	freshwater	Cypriniformes: cyprinid (ide, chub, redfin)	Eurasia
<i>D. pseudoflagillicirrus</i>	freshwater	Cypriniformes: cyprinid (topmouth culter, redknife)	Asia
<i>D. pseudogobii</i>	freshwater	Cypriniformes: cyprinid (gudgeon, lizard gudgeon,	Asia

		pseudogoby)	
<i>D. pseudoheemiculteri</i>	freshwater	Cypriniformes: cyprinid (minnow)	China
<i>D. pseudominor</i>	freshwater	Cypriniformes: cyprinid (riffle minnows)	Asia
<i>D. pseudosphyrna</i>	freshwater	Cypriniformes: cyprinid (beardless barb, cherry barb)	Asia
<i>D. pterocleidus</i>	freshwater	Cypriniformes: cyprinid (redknife)	China
<i>D. pterygialis</i>	freshwater	Cypriniformes: cyprinid (topmouth culter, redknife)	Asia
<i>D. ptychidionis</i>	freshwater	Cypriniformes: cyprinid (ratmouth barbel)	China
<i>D. tychocheilus</i>	freshwater	Cypriniformes: cyprinid (pikeminnow)	North America
<i>D. pulcher</i>	freshwater	Cypriniformes: cyprinid (asp, scraper, barbel)	Eurasia
<i>D. puntii</i>	freshwater	Cypriniformes: cyprinid (cherry barb)	Asia
<i>D. puntioplites</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. pusillus</i>	freshwater	Cypriniformes: cyprinid (sharpbelly)	Asia
<i>D. pyriformis</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. qingshuihaiensis</i>	freshwater	Cypriniformes: cyprinid (kanglang)	China
<i>D. quadricurvitubus</i>	freshwater	Cypriniformes: cyprinid (dusky barbel)	China
<i>D. quangfami</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. qujiangensis</i>	freshwater	Cypriniformes: cyprinid (ink carp)	China
<i>D. quxianensis</i>	freshwater	Cypriniformes: cyprinid (?)	China
<i>D. ramosus</i>	freshwater	Cypriniformes: cyprinid (scraper)	Asia
<i>D. ramulosus</i>	freshwater	Cypriniformes: cyprinid (ide, chub, roach)	Eurasia
<i>D. rarissimus</i>	freshwater	Cypriniformes: cyprinid (roach)	Eurasia
<i>D. rarus</i>	freshwater	Cypriniformes: cyprinid (doty barbel)	Korea
<i>D. rastellus</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. reciprocus</i>	freshwater	Cypriniformes: cyprinid (bigeye chub, river chub)	North America
<i>D. rectotrabus</i>	freshwater	Cypriniformes: cyprinid (red garra)	Asia
<i>D. reinii</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. remicirrus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Asia
<i>D. retiformis</i>	freshwater	Cypriniformes: cyprinid (minnow)	Asia
<i>D. retroversus</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. rhadicirrus</i>	freshwater	Cypriniformes: cyprinid (minnow)	China
<i>D. rhinichthius</i>	freshwater	Cypriniformes: cyprinid (riffle dace)	North America
<i>D. rhinogobii</i>	freshwater	Gobiiformes: gobiid (goby)	Asia
<i>D. rhodeusi</i>	freshwater	Cypriniformes: cyprinid (bitterling)	Eurasia
<i>D. rhombocarpus</i>	freshwater	Cypriniformes: cyprinid (minnow)	Asia
<i>D. rhynchoideus</i>	freshwater	Cypriniformes: cyprinid (minnow)	Asia
<i>D. richardsonius</i>	freshwater	Cypriniformes: cyprinid (redside shiner)	North America
<i>D. rimskykorsakowi</i>	freshwater	Cypriniformes: cyprinid (bleak, yellowfin, smallscale yellowfin)	Middle-East, Eurasia
<i>D. ritius</i>	freshwater	Siluriformes: bagrid (catfish)	Asia
<i>D. rizvii</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. robisoni</i>	freshwater	Cypriniformes: cyprinid (bluehead shiner)	North America
<i>D. robustus</i>	freshwater	Esociformes: esocid (pike, asp, ide, chub)	Eurasia
<i>D. rohdeianus</i>	freshwater	Cypriniformes: cyprinid (scraper)	Asia
<i>D. rongjianensis</i>	freshwater	Cypriniformes: cyprinid (barb)	China
<i>D. rosickyi</i>	freshwater	Cypriniformes: cyprinid (roach)	Europe
<i>D. rostellum</i>	freshwater	Cypriniformes: cyprinid (bonelip)	Indo-China
<i>D. rostricirrus</i>	freshwater	Cypriniformes: cyprinid (sharpbelly)	Asia
<i>D. rostrum</i>	freshwater	Cypriniformes: cyprinid (doty barbel)	Korea
<i>D. ruahae</i>	freshwater	Cypriniformes: cyprinid (scraper, barbel)	Eurasia
<i>D. rubellus</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. rufiji</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. rutilus (rutili)</i>	freshwater	Cypriniformes: cyprinid (roach)	Eurasia
<i>D. rysavyi</i>	freshwater	Cypriniformes: cyprinid (riffle minnow, asp)	Asia
<i>D. sacrati</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. sagittavaginalis</i>	freshwater	Cypriniformes: cyprinid (bonelip)	Indo-China
<i>D. sagmaformis</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. sahelensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. sahuensis</i>	freshwater	Cypriniformes: cyprinid (carp)	Eurasia
<i>D. salutaris</i>	freshwater	Cypriniformes: cyprinid (jaw beard)	China
<i>D. sanhuiensis</i>	freshwater	Cypriniformes: cyprinid (ink carp)	China

<i>D. sanjiangensis</i>	freshwater	Cypriniformes: cyprinid (biglip gudgeon)	China
<i>D. sarani</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. sarcocheilichthydis</i>	freshwater	Cypriniformes: cyprinid (thicklip gudgeon)	Asia
<i>D. saurogobii</i>	freshwater	Cypriniformes: cyprinid (lizard gudgeon)	Asia
<i>D. scalpelliformis</i>	freshwater	Cypriniformes: cyprinid (redknife)	China
<i>D. sceptici</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. schizocypris</i>	freshwater	Cypriniformes: cyprinid (snow trout)	Asia
<i>D. schizopygopsis</i>	freshwater	Cypriniformes: cyprinid (false osman)	China
<i>D. sclerovaginalis</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. scorpius</i>	freshwater	Cypriniformes: cyprinid (Rifian barbel)	Africa
<i>D. scroticirrus</i>	freshwater	Cypriniformes: cyprinid (yellowfin)	Eurasia
<i>D. scutatus</i>	freshwater	Cypriniformes: cyprinid (cutlip minnow)	North America
<i>D. seamsteri</i>	freshwater	Cypriniformes: cyprinid (suckermouth minnow)	North America
<i>D. securiformis</i>	freshwater	Cypriniformes: cyprinid (doty barbel)	Korea
<i>D. seenghali</i>	freshwater	Siluriformes: bagrid (catfish)	Asia
<i>D. sekerai</i>	freshwater	Cypriniformes: cyprinid (cherry barb)	Asia
<i>D. sekulovici</i>	freshwater	Cypriniformes: cyprinid (roach)	Europe
<i>D. selliformis</i>	freshwater	Cypriniformes: cyprinid (?)	China
<i>D. sematus</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. semifasciolatae</i>	freshwater	Cypriniformes: cyprinid (scraper)	Asia
<i>D. semilabeo</i>	freshwater	Cypriniformes: cyprinid (pseudogyrinocheilid)	China
<i>D. semotilus</i>	freshwater	Cypriniformes: cyprinid (stoneroller, bluntnose minnow, creek chub)	North America
<i>D. senegalensis</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. shantungensis</i>	freshwater	Cypriniformes: cyprinid (yellowcheek)	Asia
<i>D. shengxianensis</i>	freshwater	Cypriniformes: cyprinid (silverfish)	Asia
<i>D. siamensis</i>	freshwater	Cypriniformes: cyprinid (cherry barb)	Asia
<i>D. sichuanensis</i>	freshwater	Cypriniformes: cyprinid (ya-fish)	China
<i>D. simiae</i>	freshwater	Cypriniformes: cyprinid (barb)	Europe
<i>D. similis</i>	freshwater	Cypriniformes: cyprinid (bream, vimba bream, white bream, bleak, asp, tench, nase, osman, bluntnose minnow, ide, chub, sabre carp, roach, rudd)	Eurasia
<i>D. simplex</i>	freshwater	Cypriniformes: cyprinid (osman)	Asia
<i>D. simplexus</i>	freshwater	Cypriniformes: cyprinid (bluntnose minnow)	North America
<i>D. simplicimalleata</i>	freshwater	Cypriniformes: cyprinid (bream, white bream, sabre carp, roach)	Eurasia
<i>D. singularis</i>	freshwater	Cypriniformes: cyprinid (thicklip gudgeon)	Asia
<i>D. sinibramis</i>	freshwater	Cypriniformes: cyprinid (silverfish)	Asia
<i>D. sinilabe</i>	freshwater	Cypriniformes: cyprinid (biglip gudgeon)	China
<i>D. sinogastromyzoni</i>	freshwater	Cypriniformes: homalopterid (loach)	Eurasia
<i>D. skrjabinensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. skrjabini</i>	freshwater	Cypriniformes: cyprinid (silver carp)	Asia
<i>D. slastnikowi</i>	freshwater	Cypriniformes: cyprinid (smallscale yellowfin)	Asia
<i>D. soikhaonensis</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. solidus</i>	freshwater	Cypriniformes: cyprinid (carp)	Eurasia
<i>D. soni</i>	freshwater, marine	Gobiiformes: gobiid (goby)	Africa, Australia
<i>D. souffi</i>	freshwater	Cypriniformes: cyprinid (ide, chub)	Eurasia
<i>D. sparsus</i>	freshwater	Cypriniformes: cyprinid (gudgeon)	China
<i>D. spatulus</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. speciosus</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. sphyrna</i>	freshwater	Cypriniformes: cyprinid (bream, vimba bream, white bream, bleak, mullet, gudgeon, ide, chub, sabre carp, bitterling, roach, rudd)	Eurasia, Middle-East
<i>D. sphyrnoides</i>	freshwater	Cypriniformes: cyprinid (barbel, tor barb)	Eurasia, Africa
<i>D. spinibarbichthi</i>	freshwater	Cypriniformes: cyprinid (barbel, spiny barbel)	Asia
<i>D. spinicirrus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. spinitubus</i>	freshwater	Cypriniformes: cyprinid (Indian carp)	Asia
<i>D. spiralis</i>	freshwater	Cypriniformes: cyprinid (Crucian carp)	Europe
<i>D. spirocirrus</i>	freshwater	Cypriniformes: cyprinid (doty barbel)	Korea
<i>D. spirotubivagina</i>	freshwater	Cypriniformes: cyprinid (red garra)	Asia

<i>D. spirovagina</i>	freshwater	Cypriniformes: cyprinid (bonelip)	Indo-China
<i>D. spiruli</i>	freshwater	Cypriniformes: cyprinid (bonelip)	Indo-China
<i>D. sprostonae</i>	freshwater	Cypriniformes: cyprinid (barbel chub, ide, chub)	Eurasia
<i>D. squaliobarbi</i>	freshwater	Cypriniformes: cyprinid (barbel chub)	Asia
<i>D. squameus</i>	freshwater	Cypriniformes: cyprinid (gudgeon, topmouth gudgeon)	Asia
<i>D. stankovici</i>	freshwater	Cypriniformes: cobitid (stone loach)	Asia
<i>D. strelkowi</i>	freshwater	Cypriniformes: cyprinid (Amur bream, white bream)	Asia
<i>D. strombus</i>	freshwater	Cypriniformes: cyprinid (rectoris)	Asia
<i>D. subtilis</i>	freshwater	Cypriniformes: cyprinid (barbel, cherry barb)	Eurasia, Africa
<i>D. suchengtaii</i>	freshwater	Cypriniformes: cyprinid (bighead carp, silver carp)	Asia
<i>D. suecicus</i>	freshwater	Cypriniformes: cyprinid (roach)	Eurasia
<i>D. sukkurensis</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. sungariensis</i>	freshwater	Cypriniformes: cyprinid (barbel chub)	Asia
<i>D. symavesi</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. tabellaeformis</i>	freshwater	Cypriniformes: cyprinid (rock carp)	China
<i>D. taihuensis</i>	freshwater	Cypriniformes: cyprinid (bighead carp)	Asia
<i>D. takahashii</i>	freshwater	Cypriniformes: cyprinid (carp)	Eurasia
<i>D. talimuensis</i>	freshwater	Cypriniformes: cyprinid (Tarim schizothoracin)	China
<i>D. tapienensis</i>	freshwater	Cypriniformes: cyprinid (cherry barb)	Asia
<i>D. tauricus</i>	freshwater	Cypriniformes: cyprinid (riffle minnows)	Asia
<i>D. tchangi</i>	freshwater	Cypriniformes: cyprinid (barbel chub)	Asia
<i>D. tenax</i>	freshwater	Cypriniformes: cyprinid (creek chub)	North America
<i>D. tendiculus</i>	freshwater	Cypriniformes: cyprinid (bleak, yellowfin, smallscale yellowfin)	Middle-East, Eurasia
<i>D. tenuis</i>	freshwater	Perciformes: percoid (perch)	cosmopolitan
<i>D. teresae</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. tetraradiatus</i>	marine	Clupeiformes: clupeid (herring)	India
<i>D. texomensis</i>	freshwater	Cypriniformes: cyprinid (bigeye chub)	North America
<i>D. thailandensis</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. thapari</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. tihsiukangi</i>	freshwater	Cypriniformes: cyprinid (bleak, yellowfin, smallscale yellowfin)	Middle-East, Eurasia
<i>D. tincae</i>	freshwater	Cypriniformes: cyprinid (tench)	Eurasia
<i>D. tissensis</i>	freshwater	Cypriniformes: cyprinid (riffle minnow, bleak)	Asia
<i>D. titus</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. tongrenensis</i>	freshwater	Cypriniformes: cyprinid ()	
<i>D. tongtinensis</i>	freshwater	Cypriniformes: cyprinid (redknife)	China
<i>D. tonguthaii</i>	freshwater	Cypriniformes: cyprinid (cherry barb)	Asia
<i>D. tonii</i>	freshwater	Cypriniformes: cobitid (stone loach)	Asia
<i>D. tonkinensis</i>	freshwater	Cypriniformes: cyprinid (scraper)	Eurasia
<i>D. tori</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. torquegenitalis</i>	freshwater	Cypriniformes: cyprinid (bonelip)	Indo-China
<i>D. toxostomi</i>	freshwater	Cypriniformes: cyprinid (nase)	Europe
<i>D. triappendixis</i>	freshwater	Cypriniformes: cyprinid (?)	?
<i>D. tridactylus</i>	freshwater	Cypriniformes: cyprinid (pikeminnow)	North America
<i>D. tridens</i>	freshwater	Cypriniformes: cyprinid (yellowfin)	Eurasia
<i>D. tridigitatus</i>	freshwater	Cypriniformes: cyprinid (sharpbelly)	Asia
<i>D. trifucellatoides</i>	freshwater	Cypriniformes: cyprinid (blackfish)	Asia
<i>D. trioxonis</i>	freshwater	Cypriniformes: cyprinid (bitterling)	Europe
<i>D. tripathii</i>	freshwater	Cypriniformes: cyprinid (cherry barb)	Asia
<i>D. trullaeformis</i>	freshwater	Cypriniformes: cyprinid (jaw beard)	China
<i>D. tuba</i>	freshwater	Cypriniformes: cyprinid (riffle minnow, asp, pike asp, tench, vimba bream, barbel, crucian carp, ide, chub, roach, rudd); Perciformes: percoid (perch); Esociformes: esocid (pike),	Eurasia, North America
<i>D. tubarius</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. tubatus</i>	freshwater	Cypriniformes: cyprinid (barbel chub)	Asia
<i>D. tubulus</i>	freshwater	Cypriniformes: cyprinid (false halfknife)	Asia
<i>D. tunisiensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa

<i>D. turaliensis</i>	freshwater	Cypriniformes: cyprinid (roach)	Eurasia
<i>D. turkestanikus</i>	freshwater	Cypriniformes: cyprinid (sharpray)	Asia
<i>D. tylognathi</i>	freshwater	Cypriniformes: cyprinid (mudcarp, red garra)	Asia
<i>D. umbelliformis</i>	freshwater	Cypriniformes: cyprinid (mahseer)	Asia
<i>D. unguiformis</i>	freshwater, marine	Salmoniformes: salmonid (whitefish); Scorpaeniformes: cottid (sculpin)	cosmopolitan
<i>D. ungulatus</i>	freshwater	Cypriniformes: cyprinid (yellowfin)	Eurasia
<i>D. urus</i>	freshwater	Cypriniformes: catostomid (redhorse)	North America
<i>D. uyei</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. vaginulatus</i>	freshwater	Cypriniformes: cyprinid (bighead carp, grass carp, silver carp)	Asia
<i>D. valeti</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. validus</i>	freshwater	Cypriniformes: cyprinid (scraper)	Eurasia
<i>D. vancleavei</i>	freshwater	Cypriniformes: cyprinid (chiselmouth, pikeminnow)	North America
<i>D. vannus</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. varicorhini</i>	freshwater	Cypriniformes: cyprinid (scraper)	Eurasia
<i>D. varicorhinoides</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. varius</i>	freshwater	Cypriniformes: cyprinid (Maghreb barbel)	Africa
<i>D. vastator</i>	freshwater	Cypriniformes: cyprinid (scraper, vimba bream, barbel, carp, crucian carp, grass carp), cobitid (weather loach), Esociformes: esocid (pike)	Eurasia
<i>D. venusti</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. vicinus</i>	freshwater	Cypriniformes: cyprinid (black 'shark')	Eurasia
<i>D. vistulae</i>	freshwater	Cypriniformes: cyprinid (nase, ide, chub, roach)	Eurasia
<i>D. viticulus</i>	freshwater	Cypriniformes: cyprinid (cherry barb)	Asia
<i>D. volfi</i>	freshwater	Cypriniformes: cyprinid (cherry barb)	Asia
<i>D. volgensis</i>	freshwater	Cypriniformes: cyprinid (white bream)	cosmopolitan
<i>D. volutus</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa
<i>D. vranoviensis</i>	freshwater	Cypriniformes: cyprinid (ide, chub)	Eurasia
<i>D. wegeneri</i>	freshwater	Cypriniformes: cyprinid (carp, crucian carp)	Eurasia
<i>D. weishanensis</i>	freshwater	Cypriniformes: cyprinid (bitterling)	Europe
<i>D. welakae</i>	freshwater	Cypriniformes: cyprinid (eastern shiner)	North America
<i>D. wuae</i>	freshwater	Cypriniformes: cyprinid (topmouth culter)	Asia
<i>D. wuhanensis</i>	freshwater	Cypriniformes: cyprinid (smallscale yellowfin)	Asia
<i>D. wuhuensis</i>	freshwater	Cypriniformes: cyprinid (silver carp)	Asia
<i>D. wunderi</i>	freshwater	Cypriniformes: cyprinid (bream, white bream, sharpray, mullet, roach)	Eurasia
<i>D. wurtzii</i>	freshwater	Cypriniformes: cyprinid (scraper)	Eurasia
<i>D. xenocypris</i>	freshwater	Cypriniformes: cyprinid (yellowfin, smallscale yellowfin)	Eurasia
<i>D. xichangensis</i>	freshwater	Cypriniformes: cyprinid (minnow)	China
<i>D. xihuensis</i>	freshwater	Cypriniformes: cyprinid (sharpbelly)	Asia
<i>D. xinjiangensis</i>	freshwater	Cypriniformes: cyprinid (ide)	Asia
<i>D. xiondareni</i>	freshwater	Cypriniformes: cyprinid (?)	China
<i>D. xiyangjiangensis</i>	freshwater	Cypriniformes: cyprinid (false halfknife)	Asia
<i>D. yassensis</i>	freshwater	Cypriniformes: cyprinid (African carp)	Africa
<i>D. yinjiangensis</i>	freshwater	Cypriniformes: cyprinid (pseudogyrinocheilid)	China
<i>D. yinwenyingae</i>	freshwater	Cypriniformes: cyprinid (bream, white bream, asp, nase, carp, grass carp, silver carp, ide, chub, minnow, roach, rudd, biglip gudgeon)	Eurasia
<i>D. yogendrai</i>	freshwater	Cypriniformes: cyprinid (carp, black 'shark')	Asia
<i>D. youjiangensis</i>	freshwater	Cypriniformes: cyprinid (false halfknife)	Asia
<i>D. yousefpouri</i>	freshwater	Cypriniformes: cyprinid (morari)	Middle-East
<i>D. yuyaoensis</i>	freshwater	Cypriniformes: cyprinid (redwing fish)	Asia
<i>D. zaccoi</i>	freshwater	Cypriniformes: cyprinid (minnow)	Asia
<i>D. zachvatkini</i>	freshwater	Cypriniformes: cyprinid (jaw beard)	China
<i>D. zaleskyi</i>	freshwater	Cypriniformes: cyprinid (bream, white bream, yellowfin, smallscale yellowfin)	Eurasia
<i>D. zandti</i>	freshwater	Cypriniformes: cyprinid (bream, white bream)	Eurasia
<i>D. zatensis</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa

<i>D. zoanyngi</i>	freshwater	Cypriniformes: cyprinid (carp)	Asia
<i>D. zulfikari</i>	freshwater	Cypriniformes: cyprinid (barbel)	Eurasia, Africa

Parasite morphology: Dactylogyrid monogenean parasites have 3 distinct developmental stages: eggs, larvae (oncomiracidia) and adults. The eggs are oval in shape and quite variable in size depending on the species: dimensions ranging from 32-120 μm in length by 28-60 μm in width. The eggs have large tanned egg capsules, sometimes with a short polar filament at the posterior end. Eggs hatch to release a free-swimming ciliated larva (called an oncomiracidium) which is elongate measuring 95-130 x 35-50 μm . The larvae are covered with tufts of ciliated locomotory cells, usually have 2 pairs of large pigmented eye and already have a distinct posterior haptor (opisthaptor) with developed marginal hooks and primordial anchors. The worms progress through immature juvenile stages (sometimes called post-oncomiracidia) to form hermaphroditic adults which are protandrous (male reproductive organs develops before female organs, so immature stages often possess no or little pigmented vitellaria). Adult worms are small measuring 0.3-2.0 mm in length by 0.15-0.30 mm in width and have shed their oncomiracidial ciliated cells. Members of the genus *Dactylogyrus* are readily recognized by the possession of a 4-lobed head usually with 2 pairs of pigmented eyes (some species with only 1 pair) and a posterior haptor (opisthaptor) with 1 conspicuous pair of large ventral anchors (sometimes called hooks), 1-2 connective dorsal bars and up to 14 small marginal hooks (sometimes called hooklets). Adults have a sclerotized copulatory apparatus composed of a copulatory tube and an accessory piece, and the internal female reproductive organs comprise a germarium (producing oocytes) and extensive pigmented vitellaria (vitelline cells provide nourishment for developing embryo and contribute to eggshell formation). Adult worms are oviparous (egg-laying) and extrude mature eggs.

Site of infection: Dactylogyrids are commonly known as gill flukes and are found predominantly on the gills of their fish hosts (mainly cyprinids), although in heavy infections, worms may be found attached to the skin, fins and inside the buccal cavity. Oncomiracidia are free-swimming within their aquatic environments.

Pathogenesis: Adult worms attach to gill tissues and feed on epithelial cells and mucus, thus causing traumatic damage which becomes the focal point for haemorrhage, inflammation, necrosis, gill metaplasia and/or hyperplasia, excessive mucus production and often secondary bacterial and fungal infections. Infected fish may exhibit significant morbidity and mortality, with clinical signs including anorexia, lethargy and respiratory distress with aberrant behaviours (elevated respiration, opercular flapping or flaring, swimming near the surface, gasping, scratching gills on rocks, and leaping out of water). The severity of disease is often dependent on the intensity of infection, with many worms causing more severe signs, although some fish species appear to be more resistant to clinical infections and can tolerate larger worm populations with less ill effect. Some hosts have also demonstrated spontaneous declines in infection rates, apparently associated either with the development of protective immune responses or the rate of gill growth and repair (faster in fingerling stages).

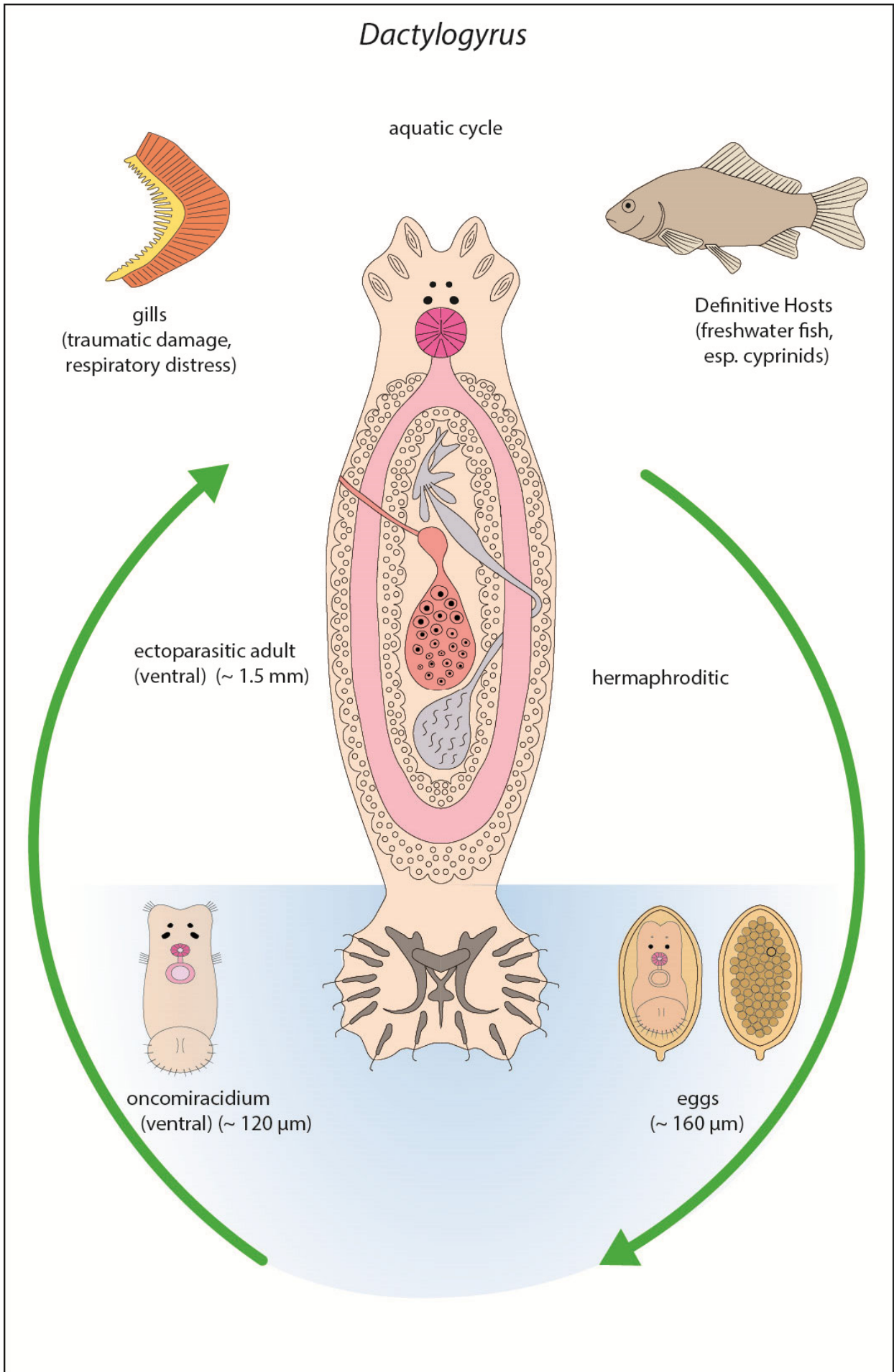
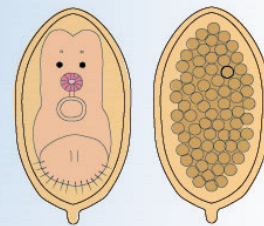
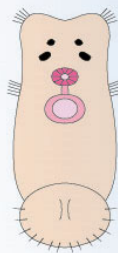
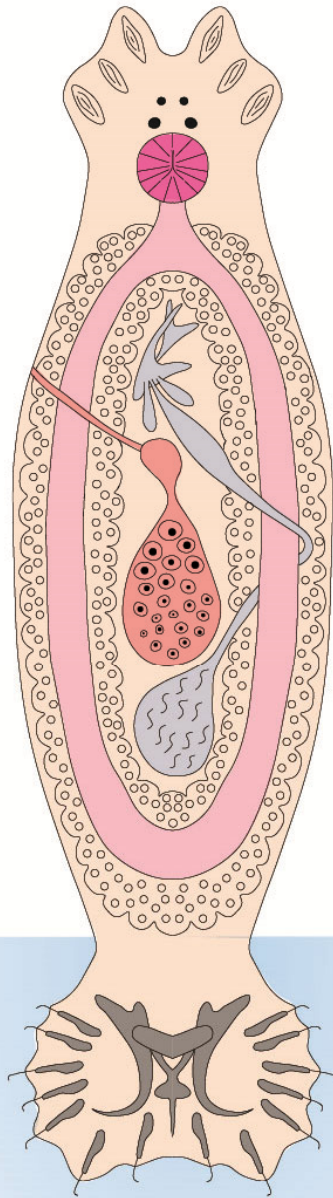
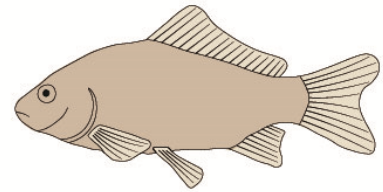
Developmental cycle and mode of transmission: *Dactylogyrus* spp. undergo direct transmission between fish hosts involving free-swimming larval stages (oncomiracidia) which seek new hosts. Mature worms lay from 4-60 (usually 4-10) eggs per day which are released into the aquatic environment and sediment to the benthos (although some species produce eggs with short polar filaments which aid in their suspension or entanglement with substrates). Depending on temperature, the eggs hatch within several days to release ciliated oncomiracidium which actively swim about seeking new hosts. Although the larvae may live for 1-2 days, they apparently lose their infectivity after 4-8 hours. Larvae infect new hosts either by attaching directly to the gills when washed through with inhaled water, or by attaching to the skin and then migrating to the gills. Once the oncomiracidia attach, they shed their ciliated cells and develop into hermaphroditic adults over 4-5 days. Adult worms usually live for 5-40 days and spend their entire lives on the same host. While the whole life-cycle may be completed in several days in water temperatures around 20°C, it may take substantially longer (weeks to months) when water temperatures are lower. A few species have exhibited prolonged lifespans (over a year) with reproduction limited to warmer seasons and peak infections occurring in late autumn or early winter. Heavier infections have also been detected in fish during their spawning seasons.

Differential diagnosis: Infections are best diagnosed by the direct microscopic detection of parasites in wet mounts of fresh gill biopsies (smears, scrapes or snips). Specimens should be recovered without excessive blood or mucus and then fixed in 1-2% formalin. Sclerotized organs are best viewed in samples embedded under pressure in glycerin mounts. Members of the genus *Dactylogyrus* can be readily identified by their characteristic morphological features (notably their 4-lobed heads, 4 eyespots, and opisthaptor with anchors and hooks), although it can be difficult to resolve individual species due to their morphotypic heterogeneity.

Treatment and control: Prompt diagnosis and treatment is paramount for controlling gyrodactylid outbreaks as their short generation times can lead to rapid increases in parasite populations in susceptible fish. Infections can spread rapidly through aquaria and culture systems, especially where stocking densities are high. Effective methods for controlling infections involve bathing fish in various chemical solutions, including anthelmintics (praziquantel, levamisole, fenbendazole, albendazole), organophosphates (metrifonate, dichlorvos, trichlorfon, bromex), salts (sodium chloride, copper sulphate), oxidising agents (hydrogen peroxide, peracetic acid, sodium percarbonate, potassium permanganate) and reducing agents (formaldehyde, formalin). However, gyrodactylid eggs are very resistant to chemical treatment so multiple treatments are required to control infections. Consideration should be given to ambient environmental conditions (water quality, temperature, salinity, organic content) as well as drug retention times and with-holding periods.

Dactylogyrus

aquatic cycle





Dactylogyrus adult worm



Dactylogyrus adult worm