

Hymenolepis

(platyhelminth: cestode)

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. Cestodes (tapeworms) have elongate ribbon-like bodies ranging from a few millimetres to several metres in length. Cyclophyllidean tapeworms are usually intestinal parasites of terrestrial vertebrates and have an anterior scolex (hold-fast organ with suckers and sometimes hooks) and a posterior tape (strobila) made up of segments (proglottids). Adult worms lack a gut (they absorb nutrients) and they are hermaphroditic (segments containing both male and female reproductive organs). Eucestodes have indirect life-cycles involving oncospheres (hexacanth embryos) released from ingested eggs to form encysted larval stages (metacestodes) in the tissues of intermediate hosts and their transmission to definitive hosts by predation. Adult hymenolepids have an armed or unarmed rostellum, slender strobila and are parasitic in birds, rodents and humans, infections often being asymptomatic but sometimes causing enteritis. The encysted larval stages (cysticercoids) of *Hymenolepis* spp. occur in a range of terrestrial insects or aquatic copepods which are consumed during foraging.

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: Cestoda (tapeworms, gut absent, anterior scolex, proglottid segments, heteroxenous, predator-prey cycles)
Subclass: Eucestoda (larvae hexacanth (with six hooks))
Order: Cyclophyllidea (terrestrial species, scolex with four suckers, often bearing hooks, eggs release oncospheres)
Family: Hymenolepididae (tapeworms of birds/rodents/humans, slender strobilia, 1-4 testes, cysticercoid larva)
Genus: *Hymenolepis* (parasitic in small intestines of mammals/birds)
Species: various species cause enteritis in humans

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 (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).

The cestodes (or tapeworms) lack digestive tracts and have elongate ribbon-like bodies (strobila); most being polyzoic (segmented) divided internally and/or externally into proglottids, although some are monozoic (unsegmented). Serial proglottids may be craspedote (overlapping) or acraspedote. Proglottids are generally hermaphroditic, possessing both male and female reproductive organs (those in which the male system matures first are protandrous, those in which the female system matures first are progynous). Terminal proglottids may detach from the strobila when they are immature (hyperapolytic), mature (euapolytic) or gravid (apolytic), or remain attached until they degenerate (anapolytic). Cestodes possess remarkable anterior attachment organs on the head (scolex): many divided into 4 membrane-bound muscular acetabula evident as suckers or bothridia (stalked, fused or bearing loculi); others bearing two weakly muscular bothria; some possessing a simple apical funnel (monobothriate); and some

with a complex apical organ or rostellum that may be retractable, armed with hooks or bearing tentacles. Fertile tapeworms produce eggs in which larval stages develop as non-ciliated oncospheres or ciliated coracidia or lycophores. These stages possess 6 or 10 hooks which they use to invade the tissues of intermediate hosts where they form encysted metacestode stages: either alacunate forms (proceroid with tail-like cercomer, plerocercus with retracted scolex, plerocercoid with an everted scolex, or merocercoid with an invaginated scolex) or lacunate forms (cysticercoid with cercomer and a retracted scolex, or cysticercus with an invaginated scolex). Two main cestode subclasses are recognized: Cestodaria with decacanth larvae (with 10 hooks) and Eucestoda with hexacanth larvae (with 6 hooks). The Eucestoda are divided into 17 orders on the basis of many morphological and biological differences, many groups being well supported by contemporary molecular characterization studies. Acetabulate orders (with bothridia) include Lecanicephalidea, Tetrphyllidea, Proteocephalidea, Cyclophyllidea, Tetrabothriidea, Phyllobothriidea and Rhinebothriidea; those bearing bothria include Bothriocephalidea, Caryophyllidea, Diphyllidea, Diphyllbothriidea, Haplobothriidea, Spathebothriidea and Trypanorhyncha; while others with apical pads/suckers include Cathetocephalidea, Litobothriidea and Nippotaeniidea.

Order (+ no. families)	No. spp.	DH ^a	Scolex	IH1 ^b	Stage ^d	IH2 ^c	Stage ^d
Class: Cestoda (tapeworms, without gut, monoecious, endoparasites, heteroxenous, predator-prey cycles)							
monozoic (unsegmented)							
Subclass: Cestodaria (adult lacking scolex, larvae decacanth (with 10 hooks))							
Gyrocotylidea (1)	10	F,S,L	muscular sucker-like organ	-	-	-	-
Amphilinidea (1)	8	F,P	muscular proboscis, or absent	C	pro	-	-
Subclass: Eucestoda ('true' tapeworms, adult with variable scolex; larvae hexacanth (with six hooks))							
Caryophyllidea (4)	122	F	acetabula, loculi, bothria, apical disc or polymorphic	W	pro		
polyzoic (segmented)							
Cathetocephalidea (1)	6	S	apical pad, papillary band				
Diphyllidea (2)	59	S,R	2 bothria; armed rostellum	C,L	ple		
Trypanorhyncha (16)	315	S,R	2 or 4 bothria, 4 tentacles	C	pro	F,C,L	ple, plc
Litobothriidea (1)	9	S	apical sucker, 3-5 segments				
Lecanicephalidea (3)	90	S,R	4 suckers or bothridia, and apical structure or tentacles	C,L,F	pro		
Rhinebothriidea (4)	136	R	4 stalked loculate bothridia	C	pro	F	ple
"Tetrphyllidea" relics (6)	104	S,R,M	4 stalked bothridia	C	pro	F,L,C, M	ple, mer
Spathebothriidea (4)	6	F	undifferentiated or 1-2 bothria	C	ple		
Haplobothriidea (1)	2	F	club-shaped, tentacles, bothria	C	pro	F	ple
Bothriocephalidea (7)	132	F,A	2 bothria	C	pro	F	ple
Nippotaeniidea (1)	6	F	single sucker	C			
Tetrabothriidea (1)	70	B,M	4 muscular bothridia	C,F			
Phyllobothriidea (1)	69	S,R	unarmed bothridia, apical suckers	C,F	ple		
Oncoprotocephalidea (2)	562	F,A,P,S,R	4 loculate bothridia, rostellum	C	pro	F	ple
Diphyllbothriidea (6) (= Pseudophyllidea)	70	M,B,P,A	2 shallow bothria, unarmed	C	pro	F,A,P, M	ple
Cyclophyllidea (16) (incl. Mesocestoididae)	3,034	M,B,P	4 suckers, rostellum, often armed	M,A,B, L,T,I	ccc, ccs	-	-
LEGEND							
^a DH = definitive host; ^b IH1 = first intermediate host; ^c IH2 = second intermediate host;							
[A = amphibian; B = bird; C = crustacean; F = teleost; I = insect; L = mollusc; M = mammal, P = reptile; R = ray; S = shark; T = acarine; W = annelid];							
^d Metacestode: pro = proceroid, plc = plerocercus; ple = plerocercoid, mer = merocercoid; ccc = cysticercoid; ccs = cysticercus, coenurus, strobilocercus or hydatid cyst							

Cyclophyllidean cestodes are polyzoic containing from 2 to > 1,000 proglottids demarcated by external segmentation. They possess an anterior scolex with 4 suckers, many with a rostellum (often armed), and they have compact post-ovarian vitellaria. Adult worms are found in terrestrial vertebrate definitive hosts (mammals, birds, reptiles, amphibians) while larval metacestodes occur in vertebrate (mammal, amphibian, bird) or invertebrate (mollusc, acari, insect) intermediate hosts. Over 3,000 species have been described in 400 genera in 16 families: Acoleidae, Amabiliidae, Anoplocephalidae, Catenotaeniidae, Davaineidae, Dioecocestidae, Dilepididae, Dipylidiidae, Gyrporhynchidae, Hymenolepididae, Mesocestoididae, Metadileptidae, Nematotaeniidae, Paruterinidae, Progynotaeniidae, and Taeniidae (all with lateral genital pores, except the Mesocestoididae).

Members of the family Hymenolepididae are characterized by adult tapeworms having slender proglottids with a small number of testes (1-4), large seminal vesicles and unilateral or irregularly alternating genital pores. Over 900 species have been described in some 130 genera; including *Allohymenolepis*, *Armadolepis*, *Brachylepis*, *Colibrilepis*, *Dollfusilepis*, *Hilmylepis*, *Hsuolepis*, *Hymenolepis* (sometimes included in *Rodentolepis*), *Mathevolepis*, *Pararodentolepis*, *Passerilepis*, *Potorolepis*, *Pseudhymenolepis*, *Rodentolepis*, *Staphylolepis*, *Triodontolepis* and *Vampirolepis*. Most species infect the intestines of their definitive hosts (over 700 species of birds and 250 species of mammals) and they form larval cysticercoid stages in arthropod intermediate hosts. *Hymenolepis* spp. occur throughout the world in temperate to tropical areas. They are found in mainly in rodents and insectivores, including birds, and several species are able to infect humans when they accidentally ingest infected arthropods (usually flour-beetles). The two species found in humans are *H. nana* and *H. diminuta*, the former often being referred to as the “dwarf tapeworm” of mice and humans (some consider it to belong to the genus *Vampirolepis* as it possesses an armed rostellum), and the latter being predominantly a parasite of rodents (it has also been used extensively as a laboratory model). Some authorities recognize two variants or subspecies of *H. nana*: namely *H. n. nana* which infects humans and *H. n. fraterna* which infect rodents, while others consider the latter to be a separate species in the genus *Rodentolepis* (more recently apparently transferred to the genus *Pararodentolepis*). Species commonly found in poultry include *H. cantaniana* and *H. carioca*.

Hymenolepid species	Definitive host [adults in intestines] [some forming cercocysts in tissues]	Intermediate hosts [cysticercoids in tissues]	Distribution
<i>Hymenolepis</i> spp. (globular scolex, 4 suckers, short retractable rostellum, sometimes armed with hooks)			
<i>H. aciculasinuata</i>	Anseriformes: anatid (mallard)		Europe
<i>H. acirrosa</i>	Bucerotiformes: upupid (African hoopoe)		Africa
<i>H. acridotheridis</i>	Passeriformes: sturnid (jungle myna)		India
<i>H. alaskensis</i>	Charadriiformes: haematopodid (black oystercatcher)		North America
<i>H. almiquil</i>	Eulipotyphla: solenodontid (Cuban solenodon)		Central America
<i>H. alterna</i>	Rodentia: murid (Philippine forest rat)		Philippines
<i>H. ampla</i>	Rodentia: cricetid (bank vole)		Europe
<i>H. angularostris</i>	Anseriformes: anatid (mallard)		Europe
<i>H. aploparaksioides</i>	Charadriiformes: haematopodid (Eurasian oystercatcher)		Europe
<i>H. apodemi</i>	Rodentia: murid (Korean field mouse, Ural field mouse, striped field mouse)		Russia
<i>H. arenariae</i>	Charadriiformes: scolopacid (ruddy turnstone)		Eurasia
<i>H. arguei</i>	Charadriiformes: larid (European herring gull)		Europe
<i>H. armata</i>	Columbiformes: columbid (naked-eyed pigeon)		Asia
<i>H. asketus</i>	Eulipotyphla: soricid (northern short-tailed shrew)		North America
<i>H. barroisii</i>	Eulipotyphla: talpid (European mole)		Europe
<i>H. baschkiriensis</i>	Charadriiformes: larid (common gull)		Holarctic
<i>H. belopolskaiae</i>	Charadriiformes: scolopacid (sanderling)		Russia
<i>H. bennetti</i>	Rodentia: dipodid (woodland jumping mouse)		North America
<i>H. bicauda</i>	Rodentia: murid (small Luzon forest mouse)		Philippines
<i>H. breviannulata</i>	Pelecaniformes: threskiornithid (plumbeous ibis)		South America
<i>H. brevis</i>	Passeriformes: locustellid (river warbler), muscicapid (Oriental magpie-robin)		Eurasia, Africa
<i>H. brustae</i>	Eulipotyphla: soricid (lesser white-toothed shrew)		Eurasia
<i>H. cameroni</i>	Anseriformes: anatid (Indian spot-billed duck)		India
<i>H. capensis</i>	Afrosoricida: chrysochlorid (Cape golden mole)		Africa
<i>H. cebidarum</i>	Primates: pitheciid (black-fronted titi monkey)		South America
<i>H. cerberensis</i>	Eulipotyphla: soricid (pygmy white-toothed shrew)		Europe
<i>H. cervotestis</i>	Charadriiformes: recurvirostrid (American avocet)		North America
<i>H. chenopsis</i>	Anseriformes: anatid (black swan)		Australia
<i>H. cholodkowskyi</i>	Otidiformes: otidid (great bustard, little bustard)		Eurasia
<i>H. christensoni</i>	Chiroptera: vespertilionid (little brown bat)		North America
<i>H. chrysolampidis</i>	Apodiformes: trochilid (ruby-topaz hummingbird)		South America
<i>H. ciconia</i>	Ciconiiformes: ciconiid (white stork)		Europe
<i>H. citelli</i>	Rodentia: geomyid (Botta's pocket gopher,		North America

	northern pocket gopher, southern pocket gopher)		
<i>H. columbae</i>	Columbiformes: columbid (lemon dove, rock dove, European turtle dove)		Eurasia, Africa
<i>H. contracta</i>	Rodentia: murid (house mouse, brown rat, black rat)		worldwide
<i>H. coraciae</i>	Coraciiformes: coraciid (European roller)		Europe
<i>H. crociduri</i>	Eulipotyphla: soricid (African giant shrew)		Africa
<i>H. cryptacantha</i>	Charadriiformes: glareolid (collared pratincole)		Europe
<i>H. diminuta</i> (syn. <i>H. flavopunctata</i> , <i>varesina</i>) (rat tapeworm, flavopunctate tapeworm)	Rodentia: murid (brown rat, black rat, roof rat, Mozambique thicket rat, tree rat, creek groove-toothed swamp rat, house mouse, wood mouse, African pygmy mouse, Barbary striped grass mouse, plain mouse, Gray's white-footed mouse, Jackson's soft-furred mouse, red-nosed mouse, southern multimammate mouse, Natal multimammate mouse, Shaw's jird, great gerbil), nesomyid (fat mouse), cricetid (bank vole, field vole, Savi's pine vole, hispid cotton rat), sciurid (squirrel), geomyid (northern pocket gopher, plains pocket gopher, Mazama pocket gopher, yellow-faced pocket gopher): Primates: cercopithecid (red-tailed monkey), hominid (human)	Siphonaptera: ceratophyllid (<i>Nosopsyllus</i> fleas), pulicid (<i>Xenopsylla</i> fleas), Lepidoptera: pyralid (<i>Asopia farinalis</i> meal moth, larvae and adults); Dermaptera: anisolabidid (<i>Anisolabis annulipes</i> earwigs, larvae and adults); Coleoptera: tenebrionid (<i>Scaurus striatus</i> darkling beetle, adults)	worldwide
<i>H. dymecodontis</i>	Eulipotyphla: talpid (True's shrew mole)		Japan
<i>H. ellisi</i>	Pelecaniformes: pelecanid (Australian pelican)		Australia
<i>H. exigua</i>	Galliformes: phasianid (chicken)	Amphipoda: talitrid (<i>Orchestia</i>)	Europe
<i>H. exilis</i>	Galliformes: phasianid (chicken)		Europe
<i>H. fallax</i>	Anseriformes: anatid (garganey, common goldeneye, Eurasian wigeon, common pochard, tufted duck, greater scaup, common eider)		Holarctic
<i>H. fanatica</i>	Phoenicoptiformes: phoenicopterid (greater flamingo)		Africa
<i>H. fasciculata</i> (syn. <i>Taenia fasciata</i>)	Anseriformes: anatid (greater white-fronted goose, greylag goose, Eurasian wigeon, common pochard)	Copepoda: cyclopid (<i>Cyclops</i>), diaptomid (<i>Diaptomus</i>)	Eurasia
<i>H. fernandensis</i>	Passeriformes: turdid (common thrush)		Europe
<i>H. filta</i>	Pelecaniformes: ardeid (cattle egret)		Eurasia, Africa
<i>H. fimula</i>	Anseriformes: anatid (common pochard)		Eurasia
<i>H. finta sp. inq.</i>	Strigiformes: strigid (brown fish owl)		Asia
<i>H. flaminata</i>	Otidiformes: otidid (houbara bustard)		Africa
<i>H. floreata</i>	Anseriformes: anatid (northern shoveler)		Holarctic
<i>H. fodientis</i>	Eulipotyphla: soricid (Eurasian water shrew)		Eurasia
<i>H. fola</i>	Charadriiformes: rostratulid (greater painted snipe)		India
<i>H. folkertsi</i>	Rodentia: cricetid (Oldfield mouse)		North America
<i>H. fona</i>	Anseriformes: anatid (mute swan)		Eurasia
<i>H. foveata</i>	Anseriformes: anatid (Indian spot-billed duck)		Asia
<i>H. fructifera</i>	Anseriformes: anatid (northern shoveler)		Egypt
<i>H. fructicosa</i>	Anseriformes: anatid (northern shoveler)		Egypt
<i>H. fungosa</i>	Otidiformes: otidid (Houbara bustard)		India
<i>H. furcouterina</i>	Suliformes: anhingid (Oriental darter)		Asia
<i>H. futilis</i>	Pelecaniformes: threskiornithid (Eurasian spoonbill)		Eurasia
<i>H. gallinae</i>	Galliformes: phasianid (chicken)		Europe
<i>H. geomydis</i>	Rodentia: geomyid (plains pocket gopher)		North America
<i>H. glandularis</i>	Charadriiformes: recurvirostrid (black-winged stilt)		Eurasia, Africa
<i>H. graeca</i>	Galliformes: phasianid (rock partridge)		India
<i>H. guadeloupensis</i>	Anseriformes: anatid (mallard)		Central America
<i>H. guschanakoi</i>	Charadriiformes: scolopacid (little stint)		Russia

<i>H. haukisalmii</i>	Rodentia: murid (large Luzon forest rat, Philippine forest rat)		Philippines
<i>H. hibernia</i>	Rodentia: murid (wood mouse)		Europe
<i>H. hipposideri</i>	Chiroptera: hipposiderid (roundleaf bat)		Eurasia
<i>H. ibidis</i>	Pelecaniformes: threskiornithid (yellow-billed spoonbill)		New Zealand
<i>H. importata</i>	Passeriformes: estrildid (Cinderella waxbill)		Africa
<i>H. intermedia</i>	Cuculiformes: cuculid (common cuckoo, Himalayan cuckoo)		Eurasia, Africa
<i>H. intricatus</i>	Eulipotyphla: soricid (vagrant shrew)		North America
<i>H. introversa</i>	Anseriformes: anatid (Eurasian teal, mallard, Indian spot-billed duck, American black duck)		Holarctic
<i>H. iriei</i>	Chiroptera: rhinolophid (greater horseshoe bat)		Eurasia
<i>H. isodontis</i>	Peramelemorphia: peramelid (southern brown bandicoot)		Australia
<i>H. jasuta</i>	Galliformes: phasianid (common quail)		India
<i>H. jerratta</i>	Charadriiformes: scolopacid (little stint)		India
<i>H. kempii</i>	Suliformes: phalacrocoracid (pygmy cormorant)		Eurasia
<i>H. kenki</i>	Eulipotyphla: soricid (vagrant shrew)		North America
<i>H. kerivoulae</i>	Chiroptera: vespertilionid (painted bat)		Asia
<i>H. lali</i>	Charadriiformes: larid (river tern)		Asia
<i>H. lasionycteridis</i>	Chiroptera: vespertilionid (silver haired bat)		North America
<i>H. limnodromi</i>	Charadriiformes: scolopacid (short-billed dowitcher)		North America
<i>H. lincola</i>	Eulipotyphla: soricid (smoky shrew)		North America
<i>H. linea</i>	Anseriformes: anatid (goose); Galliformes: phasianid (Barbary partridge, rock partridge, common quail, chicken, red grouse, grey partridge); Passeriformes: alaudid (Eurasian skylark)		Europe, Africa
<i>H. lintonella</i>	Podicipediformes: podicipedid (red-necked grebe)		Eurasia
<i>H. liphallus</i>	Anseriformes: anatid (black swan)		Australia
<i>H. lobata</i>	Anseriformes: anatid (white-cheeked pintail)		South America
<i>H. lomeensis</i>	Eulipotyphla: soricid (greater red musk shrew)		Africa
<i>H. longi</i>	Eulipotyphla: soricid (smoky shrew)		North America
<i>H. longiovata</i>	Charadriiformes: scolopacid (little stint)		Europe
<i>H. longocylindrocirrus</i>	Charadriiformes: charadriid (common ringed plover)		Eurasia
<i>H. macrocephala</i>	Anseriformes: anatid (mallard)		Eurasia
<i>H. macrorchida</i>	Psittaciformes: psittaculid (Salvadori's fig parrot)		Indonesia
<i>H. macyi</i>	Eulipotyphla: soricid (vagrant shrew)		North America
<i>H. magna</i>	Chiroptera: rhinolophid (intermediate horseshoe bat)		Asia
<i>H. mahonae</i>	Passeriformes: aegithinid (common iora)		Asia
<i>H. malaccensis</i>	Anseriformes: anatid (lesser whistling duck)		Asia
<i>H. mandabbi</i>	Anseriformes: anatid (tufted duck)		North America
<i>H. mathevossianae</i>	Rodentia: cricetid (Turkish hamster)		Russia
<i>H. megaloon</i>	Rodentia: sciurid (ground squirrel)		Palaearctic
<i>H. megalops</i>	Anseriformes: anatid (northern pintail, Brazilian teal, Eurasian teal, mallard, muscovy, Coscoroboa swan, whooper swan, tufted duck, greater scaup, white-headed duck, northern shoveler, Pacific black duck, magpie goose, Australian teal)		Holarctic, Australasia
<i>H. megalorhyncha</i>	Charadriiformes: scolopacid (purple sandpiper)		Holarctic
<i>H. meggitteella</i>	Otidiformes: otidid (Houbara bustard)		Africa
<i>H. meleagris</i>	Galliformes: phasianid (turkey)		Europe
<i>H. micrancistrota</i>	Anseriformes: anatid (black swan, whooper swan, black scoter)		America, Australia
<i>H. microacantha</i>	Rodentia: murid (highveld gerbil)		Africa
<i>H. microcephala</i>	Pelecaniformes: ardeid (grey heron, purple heron,		Africa, Eurasia

	black-crowned night heron), threskiornithid (ibis, glossy ibis); Ciconiiformes: ciconiid (white stork, Marabou stork, Abdim's stork); Charadriiformes: charadriid (Eurasian dotterel)		
<i>H. microsoma</i>	Anseriformes: anatid (Eurasian teal, long-tailed duck, Eurasian wigeon, velvet scoter, greater scaup, black scoter, common eider, king eider); Charadriiformes: larid (glaucous gull)		Holarctic
<i>H. minimedius</i>	Chiroptera: pteropodid (Indian flying fox)		India
<i>H. minor</i>	Charadriiformes: scolopacid (red-necked phalarope, red phalarope)		Holarctic
<i>H. modiglianii</i>	Passeriformes: corvid (slender-billed crow)		Indonesia
<i>H. mogerae</i>	Eulipotyphla: talpid (Kobe mole)		Japan
<i>H. moghensis</i>	Charadriiformes: chionid (stone-curlew)		tropics
<i>H. moniezi</i>	Chiroptera: pteropodid (Indian flying fox)		Asia
<i>H. mujibi</i>	Eulipotyphla: soricid (Asian house shrew)		Asia
<i>H. multistriata</i>	Anseriformes: anatid (common merganser); Podicipediformes: podicipedid (black-necked grebe, red-necked grebe, little grebe)		Eurasia
<i>H. nana</i> (syn. <i>Rodentolepis</i> , <i>Vampirolepis</i> , <i>Taenia</i>) (dwarf tapeworm)	Rodentia: murid (brown rat, black rat, dwarf field mouse, house mouse, garden dormouse); Primates: hominid (human)	Coleoptera: tenebrionid (flour beetles), Siphonaptera: ceratophyllid (<i>Nosopsyllus</i> fleas), pulicid (<i>Xenopsylla</i> fleas)	worldwide
<i>H. nasuta</i>	Passeriformes: parid (Eurasian blue tit, European crested tit, great tit, coal tit, marsh tit), aegithalid (long-tailed tit)		Eurasia, Africa
<i>H. neomeggittilis</i>	Anseriformes: anatid (northern shoveler)		Eurasia
<i>H. neosouthwelli</i>	Charadriiformes: larid (Caspian tern, brown-headed gull)		Europe
<i>H. nitida</i>	Charadriiformes: scolopacid (common snipe, dunlin, purple sandpiper, Temminck's stint, little stint, long-toed stint, black-tailed godwit), charadriid (European golden plover)		cosmopolitan
<i>H. octacantha</i>	Anseriformes: anatid (northern pintail, Eurasian teal, mallard, gadwall, northern shoveler)		Eurasia
<i>H. odaensis</i>	Chiroptera: miniopterid (eastern bent-wing bat)		Japan
<i>H. ognewi</i>	Rodentia: murid (great gerbil, Tamarisk jird, Midday jird)		Palaearctic
<i>H. olivieri</i>	Eulipotyphla: soricid (African giant shrew)		Africa
<i>H. palmarum</i>	Rodentia: sciurid (Indian palm squirrel)		India
<i>H. paradoxus</i>	Charadriiformes: scolopacid (black-tailed godwit)		Asia
<i>H. parvirostellata</i>	Coraciiformes: coraciid (broad-billed roller)		Africa
<i>H. parvissima</i>	Eulipotyphla: soricid (marsh shrew)		North America
<i>H. parvus</i>	Chiroptera: rhinolophid (greater horseshoe bat)		Eurasia
<i>H. pauciproglottis</i>	Eulipotyphla: soricid (vagrant shrew)		North America
<i>H. peipingensis</i>	Eulipotyphla: talpid (mole)		Eurasia
<i>H. pennanti</i>	Rodentia: sciurid (northern palm squirrel)		India
<i>H. petrocinclae</i>	Passeriformes: muscicapid (eastern rock thrush)		Philippines
<i>H. pigmentata</i>	Anseriformes: anatid (greater scaup)		Holarctic
<i>H. pitymi</i>	Rodentia: cricetid (pine vole)		North America
<i>H. poculifera</i>	Gruiformes: rallid (Eurasian coot)		Eurasia
<i>H. polygramma</i>	Passeriformes: parid (great tit)		Eurasia
<i>H. potoroii</i>	Diprotodontia: potorooid (long-nosed potoroo)		Australia
<i>H. procera</i>	Rodentia: cricetid (European water vole), murid (Shaw's jird)		Europe, Egypt
<i>H. pribilofensis</i>	Eulipotyphla: soricid Pribilof Island shrew)		Alaska
<i>H. promopsis</i>	Chiroptera: molossid (mastiff bat)		South America
<i>H. prudhoei</i>	Anseriformes: anatid (upland goose)		Falkland Islands
<i>H. pseudodiminuta</i>	Rodentia: murid (Eurasian field mouse)		Japan

<i>H. pseudoinflata</i>	Gruiformes: rallid (Eurasian coot)		Eurasia
<i>H. pseudosetigera</i>	Anseriformes: anatid (duck)		Iceland
<i>H. pulchra</i>	Eulipotyphla: soricid (Trowbridge's shrew)		North America
<i>H. rashomonensis</i>	Chiroptera: rhinolophid (Japanese greater horseshoe bat), vespertilionid (Natterer's bat)		Japan
<i>H. relicta</i>	Rodentia: murid (house mouse, brown rat)		Europe
<i>H. rhinopomae</i>	Chiroptera: rhinopomatid (greater mouse-tailed bat)		Middle East
<i>H. robertsi</i>	Anseriformes: anatid (Sunda teal, magpie goose)		Australasia
<i>H. rosseteri</i>	Anseriformes: anatid (mallard, northern shoveler)		Holarctic
<i>H. rudolphica</i>	Charadriiformes: glareolid (collared pratincole), scolopacid (jack snipe)		Africa, Europe
<i>H. rustica</i>	Galliformes: phasianid (chicken)		Europe
<i>H. rymzhanovi</i>	Rodentia: spalacid (Siberian zokor)		Russia
<i>H. sacciperum</i>	Anseriformes: anatid (greater scaup)		Holarctic
<i>H. scalopi</i>	Eulipotyphla: talpid (eastern mole)		North America
<i>H. sciurina sp. inq.</i>	Rodentia: sciurid (red squirrel)		Russia
<i>H. scotophii</i>	Chiroptera: vespertilionid (lesser Asiatic yellow bat)		Asia
<i>H. septaria</i>	Bucerotiformes: upupid (hoopoe)		Eurasia, Africa
<i>H. serrula</i>	Eulipotyphla: soricid (smoky shrew)		North America
<i>H. shentsengi</i>	Charadriiformes: rostratulid (greater painted-snipe)		Asia, Africa
<i>H. skrjabini</i>	Rodentia: murid (Persian jird)		Russia
<i>H. skrjabinissima</i>	Charadriiformes: scolopacid (long-toed stint)		Russia
<i>H. smythy</i>	Anseriformes: anatid (common pygmy goose)		India
<i>H. solowiowi</i>	Anseriformes: anatid (northern pintail, common pochard)		Eurasia
<i>H. sphaerophora</i>	Charadriiformes: scolopacid (common snipe, Eurasian curlew, slender-billed curlew, Eurasian woodcock)		cosmopolitan
<i>H. sphenomorphus</i>	Eulipotyphla: soricid (vagrant shrew)		North America
<i>H. spinosa</i>	Charadriiformes: rostratulid (greater painted-snipe)		Asia, Africa
<i>H. steatomidis</i>	Rodentia: murid (African marsh rat, white-bellied brush-furred rat)		Africa
<i>H. stylosa</i>	Passeriformes: corvid (western jackdaw, common raven, Eurasian jay, Eurasian magpie, rook), muscicapid (spotted flycatcher), icterid (Baltimore oriole), sylviid (warbler)		Eurasia, North America
<i>H. subrostellata</i>	Chiroptera: rhinolophid (greater horseshoe bat)		Japan
<i>H. sulcata</i>	Rodentia: glirid (edible dormouse)		Europe
<i>H. suslika</i>	Rodentia: sciurid (European ground squirrel)		Russia
<i>H. tanakpuris</i>	Galliformes: phasianid (rock partridge)		Europe
<i>H. tenuicollis</i>	Anseriformes: anatid (mallard)		Europe
<i>H. tenuis</i>	Charadriiformes: scolopacid (dunlin)		Holarctic
<i>H. trichodroma</i>	Passeriformes: trichodromid (wallcreeper)		Eurasia
<i>H. tokoinsis</i>	Eulipotyphla: soricid (greater red musk shrew)		Africa
<i>H. trichosoma</i>	Anseriformes: anatid (common pochard)		Europe
<i>H. tritesticulata</i>	Anseriformes: anatid (mallard, surf scoter, velvet scoter, common merganser, red-breasted merganser, greater scaup); Gruiformes: rallid (American coot)		Holarctic
<i>H. tsuzurasensis</i>	Chiroptera: rhinolophid (greater horseshoe bat)		Japan
<i>H. tualatinensis</i>	Rodentia: geomyid (Camas pocket gopher)		North America
<i>H. uliginosa</i>	Charadriiformes: scolopacid (jack snipe, Eurasian curlew, whimbrel, ruff); Otidiformes: otidid (houbara bustard)		Eurasia, Africa, Australia
<i>H. uncinata</i>	Eulipotyphla: soricid (greater white-toothed shrew, common shrew)		Europe, Africa
<i>H. uralensis</i>	Charadriiformes: scolopacid (common sandpiper, ruddy turnstone, common redshank)		Palaearctic

<i>H. uranomidis</i>	Rodentia: murid (white-bellied brush-furred rat, African grass rat, African marsh rat, typical striped grass mouse, Guinea multimammate mouse)		Africa
<i>H. victoriata</i>	Passeriformes: sturnid (pied myna)		India
<i>H. vilocirrus</i>	Charadriiformes: scolopacid (Hudsonian godwit)		North America
<i>H. vistulae</i>	Anseriformes: anatid (common merganser)		Europe
<i>H. vogeae</i>	Rodentia: murid (common Indian field mouse, Libyan jird)		India, Egypt
<i>H. wardlei</i>	Anseriformes: anatid (Indian spot-billed duck)		India
<i>H. weldensis</i>	Rodentia: geomyid (plains pocket gopher, yellow-faced pocket gopher, Mazama pocket gopher, northern pocket gopher)	Coleoptera: tenebrionid (<i>Tenebrio molitor</i> mealworm beetle)	North America

Hymenolepid species	Definitive host [adults in intestines] [some forming cercocysts in tissues]	Intermediate hosts [cysticercoids in tissues]	Distribution
<i>Rodentolepis</i> spp. (armed rostellum, cricetid-type hooks, three testes aligned in triangle)			
<i>R. asymmetrica</i> (syn. <i>H. arvicolae</i>)	Rodentia: cricetid (common vole, European snow vole, field vole)		Eurasia
<i>R. avetjanea</i>	Rodentia: echimyid (coyupu)		South America
<i>R. bahli</i> (syn. <i>Vampirolepis</i> , <i>Hymenolepis</i>)	Eulipotyphla: soricid (grey musk shrew)		India
<i>R. blarinae</i> (syn. <i>Vampirolepis</i> , <i>Hymenolepis</i>)	Eulipotyphla: soricid (northern short-tailed shrew)		North America
<i>R. cercarteti</i> (syn. <i>Hymenolepis</i>)	Diprotodontia: burramyid (long-tailed pygmy possum)		Australia
<i>R. crassa</i> (syn. <i>Hymenolepis</i> , <i>Vampirolepis</i>)	Rodentia: murid (house mouse, brown rat)		worldwide
<i>R. criceti</i> (syn. <i>Vampirolepis</i> , <i>Hymenolepis</i>)	Rodentia: cricetid (European hamster)		Europe
<i>R. erinacei</i> (syn. <i>Hymenolepis</i> , <i>H. steudeneri</i> , <i>Taenia</i> , <i>Dicranotaenia</i>)	Eulipotyphla: erinaceid (European hedgehog)		Europe
<i>R. evaginata</i> (syn. <i>Hymenolepis</i> , <i>Staphylocystis</i> , <i>Dicranotaenia</i>)	Rodentia: cricetid (muskrat)		Eurasia, North America
<i>R. falculata</i> (syn. <i>Vampirolepis</i> , <i>Hymenolepis</i>)	Eulipotyphla: soricid (shrew)		North America
<i>R. fraterna</i> (syn. <i>Hymenolepis fraterna</i> , <i>H. nana fraterna</i> , <i>Vampirolepis</i>) (possibly transferred to <i>Pararodentolepis</i>)	Rodentia: murid (Abyssinian grass rat, Shaw's jird, striped field mouse, Eurasian harvest mouse, house mouse, wood mouse, spinifex hopping mouse, brown rat, black rat), caviid (montane guinea pig), glirid (garden dormouse), cricetid (field vole)		Africa, Europe, South America, Australia
<i>R. globirostris</i> (syn. <i>Vampirolepis</i> , <i>Hymenolepis suricattae</i>)	Carnivora: herpestid (meerkat)		Africa
<i>R. merionis</i> (now <i>Nomadolepis</i>)	Rodentia: murid (Tamarisk jird)		Russia
<i>R. microstoma</i> syn. <i>Hymenolepis</i> , <i>Vampirolepis</i> , <i>Taenia</i> , <i>T. brachydera</i> , <i>muris-</i>	Rodentia: nesomyid (montane African climbing mouse), murid (pygmy mouse, southern multimammate mouse, house mouse, Jackson's soft-furred mouse, Shaw's jird, brown rat, black	Coleoptera: tenebrionid (flour beetles, <i>Tenebrio molitor</i> mealworm), silvanid (grain beetles)	Africa, Europe

<i>decumani</i> (mouse bile duct tapeworm)	rat), cricetid (field vole)		
<i>R. muris-variegati</i> (syn. <i>Vampirolepis</i> , <i>Sphenocanthus</i>)	Rodentia: murid (African grass rat)		Africa
<i>R. myoxi</i>	Rodentia: glirid (garden dormouse, fat dormouse), murid (black rat), sciurid (Pallas's squirrel, Eurasian red squirrel)		Eurasia
<i>R. octocoronata</i> (syn. <i>Vampirolepis</i>)	Rodentia: echimyid (coyupu)		Americas
<i>R. srivastavi</i> (syn. <i>Vampirolepis</i>)	Rodentia: cricetid (hairy-tailed bolo mouse)		South America
<i>R. straminea</i> (syn. <i>Vampirolepis</i>)	Rodentia: cricetid (European hamster), murid (African grass rat, Guinea multimammate mouse, Temminck's mouse, Peter's mouse, white-bellied brush-furred rat), nesomyid (gray climbing mouse)		Europe

Hymenolepid species	Definitive host [adults in intestines] [some forming cercocysts in tissues]	Intermediate hosts [cysticercoids in tissues]	Distribution
<i>Vampirolepis</i> spp. (armed rostellum, fraternoid-type hooks, testes aligned linearly)			
<i>V. acollaris</i>	Chiroptera: rhinolophid (croslet horseshoe bat)		Thailand
<i>V. acuta</i> (syn. <i>Hymenolepis</i>)	Chiroptera: miniopterid (common bent-wing bat), vespertilionid (Natterer's bat, brown long-eared bat, parti-coloured bat, common noctule, common pipistrelle, serotine bat), emballonurid (Egyptian tomb bat)		Eurasia, Africa
<i>V. aelleni</i>	Chiroptera: pteropodid (Wahlberg's epauletted fruit bat)		Africa
<i>V. akodontis</i>	Rodentia: cricetid (montane grass mouse)		South America
<i>V. alisahnensis</i>	Eulipotyphla: soricid (lesser white-toothed shrew)		China
<i>V. allahabadensis</i>	Eulipotyphla: soricid (mole)		India
<i>V. antechini</i> (syn. <i>Hymenolepis</i>)	Dasyuromorphia: dasyurid (dusky antechinus)		Australia
<i>V. artibeii</i>	Chiroptera: phyllostomid (Jamaican fruit bat, Pallas's long-tongued bat)		Cuba
<i>V. australiensis</i> (syn. <i>Hymenolepis</i>)	Rodentia: murid (bush rat)		Australia
<i>V. baeri</i>	Chiroptera: vespertilionid (common noctule)		Europe
<i>V. balsaci</i> (syn. <i>Hymenolepis</i>)	Chiroptera: vespertilionid (Bechstein's bat, serotine bat)		Eurasia
<i>V. bidentatus</i>	Chiroptera: phyllostomid (Cuban flower bat)		Cuba
<i>V. bihamata</i>	Chiroptera: phyllostomid (white-bellied big-eared bat)		South America
<i>V. brachysoma</i>	Chiroptera: hipposiderid (great roundleaf bat)		Asia
<i>V. brevihamata</i>	Chiroptera: vespertilionid (Ikonnikov's bat)		Japan
<i>V. cercopitheci</i> (syn. <i>Hymenolepis</i>)	Primates: cercopithecoid (greater spot-nosed monkey)		Africa
<i>V. chalinolobi</i> (syn. <i>Hymenolepis</i>)	Chiroptera: vespertilionid (New Zealand long-tailed bat)		New Zealand
<i>V. chiangmaiensis</i>	Chiroptera: rhinolophid (lesser brown horseshoe bat)		Thailand
<i>V. chiropterophila</i>	Chiroptera: molossid (velvety free-tailed bat)		Cuba
<i>V. christensoni</i>	Chiroptera: vespertilionid (little brown bat)		North America
<i>V. coelopsis</i>	Chiroptera: hipposiderid (East Asian tailless leaf-nosed bat)		Asia
<i>V. copihamata</i>	Chiroptera: molossid (wrinkle-lipped free-tailed bat)		Asia

<i>V. crassihamata</i>	Chiroptera: molossid (velvety free-tailed bat)	South America
<i>V. curviamata</i>	Chiroptera: rhinolophid (Marshall's horseshoe bat)	Thailand
<i>V. dasipteri</i> (syn. <i>Hymenolepis</i>)	Chiroptera: vespertilionid (southern yellow bat)	South America
<i>V. decipiens</i> (syn. <i>Hymenolepis</i>)	Chiroptera: mormoopid (dark brown bat, Parnell's mustached bat), molossid (western bonneted bat, Patagonian bonneted bat, Wagner's bonneted bat, cinnamon dog-faced bat, dwarf dog-faced bat, broad-eared bat), vespertilionid (big brown bat, silver-tipped myotis)	South America
<i>V. elongatus</i>	Chiroptera: mormoopid (ghost-faced bat, Davy's naked-backed bat, Wagner's mustached bat), molossid (black mastiff bat), phyllostomid (Pallas's long-tongued bat, dark fruit-eating bat, flat-faced fruit-eating bat, great fruit-eating bat, Ipanema bat, greater spear-nosed bat, Heller's broad-nosed bat)	Americas
<i>V. ezoensis</i>	Chiroptera: vespertilionid (Japanese northern bat)	Japan
<i>V. formosana</i>	Eulipotyphla: soricid (Chinese mole shrew)	Asia
<i>V. fugiensis</i>	Chiroptera: rhinolophid (greater horseshoe bat)	Japan
<i>V. gertschi</i> (syn. <i>Hymenolepis</i>)	Chiroptera: vespertilionid (California myotis)	North America
<i>V. gracilistrobila</i>	Eulipotyphla: soricid (Asian house shrew)	Japan
<i>V. grisea</i> (syn. <i>Hymenolepis</i>)	Chiroptera: rhinolophid (greater horseshoe bat), vespertilionid (parti-coloured bat, serotine bat)	Eurasia
<i>V. guarany</i>	Chiroptera: phyllostomid (great fruit-eating bat), molossid (black mastiff bat, Patagonian bonneted bat)	South America
<i>V. hakusanensis</i>	Eulipotyphla: soricid (Shinto shrew)	Japan
<i>V. hamanni</i>	Eulipotyphla: soricid (Eurasian water shrew)	Eurasia
<i>V. haradai</i>	Chiroptera: miniopterid (western bent-wing bat)	Asia
<i>V. hattorii</i> (syn. <i>Rodentolepis</i>)	Chiroptera: rhinolophid (greater horseshoe bat)	Japan
<i>V. hidaensis</i>	Chiroptera: miniopterid (eastern bent-wing bat)	Japan
<i>V. ikesakii</i>	Chiroptera: rhinolophid (little Japanese horseshoe bat)	Japan
<i>V. insula</i>	Chiroptera: vespertilionid (brown long-eared bat, ambliotus bat)	Russia
<i>V. iraqensis</i>	Chiroptera: emballonurid (naked-rumped tomb bat)	Iraq
<i>V. iriomotensis</i>	Chiroptera: rhinolophid (Imaizumi's horseshoe bat)	Japan
<i>V. isensis</i>	Chiroptera: rhinolophid (little Japanese horseshoe bat, greater horseshoe bat)	Japan
<i>V. iwatensis</i>	Chiroptera: rhinolophid (greater horseshoe bat)	Japan
<i>V. jacobsoni</i> (syn. <i>Hymenolepis</i> , <i>Rodentolepis</i>)	Eulipotyphla: soricid (musk shrew, white-toothed shrew)	Eurasia
<i>V. jakounezumi</i>	Eulipotyphla: soricid (Asian water shrew)	Asia
<i>V. johnsoni</i> (syn. <i>Rodentolepis</i>)	Rodentia: cricetid (meadow vole)	North America
<i>V. kagurakoumori</i> (syn. <i>Hymenolepis</i>)	Chiroptera: hipposiderid (great roundleaf bat)	Japan
<i>V. kaguyae</i>	Chiroptera: miniopterid (lesser long-fingered bat), vespertilionid (fraternal myotis)	Japan
<i>V. kawasakiensis</i>	Chiroptera: vespertilionid (birdlike noctule)	Japan
<i>V. kengtingensis</i>	Chiroptera: rhinolophid (Formosan woolly horseshoe bat)	Asia
<i>V. kerivoulae</i>	Chiroptera: vespertilionid (painted bat)	Asia
<i>V. khalili</i>	Eulipotyphla: soricid (shrew)	Africa
<i>V. kobayashii</i>	Chiroptera: rhinolophid (Creagh's horseshoe bat)	Japan

<i>V. krishna</i>	Rodentia: cricetid (water vole)		Nepal
<i>V. kulkiniae</i>	Chiroptera: vespertilionid (common noctule bat)		Russia
<i>V. lasionycteridis</i>	Chiroptera: vespertilionid (silver-haired bat, California myotis, Yuma myotis, long-eared myotis, long-legged myotis, little brown bat, big brown bat)		North America
<i>V. lineola</i> (syn. <i>Rodentolepis</i>) (now <i>Lineolepis</i>)	Eulipotyphla: soricid (smoky shrew)		North America
<i>V. longicollaris</i>	Chiroptera: rhinolophid (croslet horseshoe bat)		Thailand
<i>V. longisaccata</i>	Chiroptera: molossid (velvety free-tailed bat)		South America
<i>V. maclaudi</i> (syn. <i>Hymenolepis</i>)	Eulipotyphla: soricid (shrew-mouse)		Africa
<i>V. macroscelidarum</i> (syn. <i>Hymenolepis</i>)	Eulipotyphla: macroscelidid (short-snouted elephant shrew)		Africa
<i>V. macrostrobilodes</i> (syn. <i>Hymenolepis</i>)	Anseriformes: anatid (American black duck)		North America
<i>V. macrotesticulatus</i> (syn. <i>Rodentolepis</i>)	Chiroptera: rhinolophid (greater horseshoe bat, little Japanese horseshoe bat)		Japan
<i>V. macroti</i>	Chiroptera: phyllostomid (Waterhouse's leaf-nosed bat)		Central America
<i>V. magnihamata</i>	Eulipotyphla: soricid (Chinese mole shrew)		Asia
<i>V. magnioivifera</i>	Eulipotyphla: soricid (Himalayan shrew)		Asia
<i>V. magnirostellata</i> (syn. <i>Hymenolepis</i>) (now <i>Neomylepis</i>)	Eulipotyphla: soricid (Eurasian water shrew)		Eurasia
<i>V. malayensis</i> (syn. <i>Hymenolepis</i>)	Chiroptera: rhinolophid (horseshoe bat), vespertilionid (woolly bat, bamboo bat)		Malaysia
<i>V. manidis</i> (syn. <i>Rodentolepis</i>)	Pholidota: manid (giant pangolin)		Africa
<i>V. masaldari</i>	Rodentia: murid (black rat)		India
<i>V. mazanensis</i>	Chiroptera: emballonurid (greater sac-winged bat, proboscis bat)		South America
<i>V. mesopotamiana</i>	Chiroptera: hipposiderid (trident bat)		Africa
<i>V. meszarosi</i>	Rodentia: cricetid (Royle's mountain vole)		Asia
<i>V. microscolex</i>	Eulipotyphla: soricid (Asian house shrew)		Asia
<i>V. minatoi</i>	Chiroptera: miniopterid (eastern bent-wing bat)		Japan
<i>V. miniopteri</i>	Chiroptera: miniopterid (little bent-wing bat)		Australia
<i>V. molani</i>	Chiroptera: vespertilionid (Kuhl's pipistrelle)		Iraq
<i>V. molus</i>	Eulipotyphla: soricid (Asian house shrew)		India
<i>V. montana</i>	Eulipotyphla: soricid (Asian house shrew)		Sri Lanka
<i>V. mukooyamai</i>	Chiroptera: vespertilionid (Natterer's bat)		Europe
<i>V. multihamatus</i>	Chiroptera: vespertilionid (Asian particolored bat)		Japan
<i>V. muraiae</i>	Chiroptera: vespertilionid (mouse-eared bat)		China
<i>V. negevi</i> (syn. <i>Rodentolepis</i>)	Rodentia: murid (Cairo spiny mouse)		Middle East
<i>V. neomidis</i> (syn. <i>Hymenolepis</i>)	Eulipotyphla: soricid (Eurasian water shrew)		Eurasia
<i>V. nepalensis</i>	Eulipotyphla: soricid (Himalayan shrew)		Asia
<i>V. novadomensis</i>	Chiroptera: vespertilionid (whiskered bat)		Europe
<i>V. novosibirskiensis</i> (now <i>Staphylocystis furcata</i>)	Eulipotyphla: soricid (common shrew, Eurasian pygmy shrew, Laxmann's shrew)		Russia
<i>V. ogaensis</i>	Chiroptera: rhinolophid (greater horseshoe bat)		Japan
<i>V. okinawaensis</i>	Eulipotyphla: soricid (Asian house shrew)		Japan
<i>V. olsoni</i> (syn. <i>Rodentolepis</i>)	Eulipotyphla: talpid (Townsend's mole)		North America
<i>V. oregonensis</i> (syn. <i>Rodentolepis</i>)	Rodentia: cricetid (muskrat)		Eurasia
<i>V. ozensis</i>	Chiroptera: vespertilionid (brown long-eared bat)		Japan
<i>V. pandoensis</i>	Chiroptera: vespertilionid (Argentine brown bat)		South America

<i>V. parva</i> (syn. <i>Rodentolepis</i>) (now <i>Lineolepis</i>)	Eulipotyphla: soricid (shrew)		Eurasia
<i>V. pearsei</i> (syn. <i>Hymenolepis</i>)	Rodentia: murid (Peter's striped mouse, Temminck's striped mouse, Edward's swamp rat)		Africa
<i>V. petrodromi</i> (syn. <i>Hymenolepis</i>)	Eulipotyphla: macroselidid (four-toed elephant shrew)		Africa
<i>V. phyllostomi</i> (syn. <i>Hymenolepis</i>)	Chiroptera: phyllostomid (greater spear-nosed bat), molossid (dwarf bonneted bat)		South America
<i>V. pipistrelli</i>	Chiroptera: vespertilionid (common pipistrelle)		Europe
<i>V. promopsis</i>	Chiroptera: molossid (big crested mastiff bat)		South America
<i>V. rikuchuiensis</i>	Chiroptera: vespertilionid (Ikonnikov's bat)		Japan
<i>V. roudabushi</i> (syn. <i>Hymenolepis</i>)	Chiroptera: vespertilionid (big brown bat, evening bat, silver-haired bat)		North America
<i>V. rysavyi</i>	Chiroptera: vespertilionid (serotine bat)		Europe
<i>V. sandgroundi</i>	Chiroptera: vespertilionid (banana pipistrelle)		Africa
<i>V. santacruzensis</i>	Chiroptera: molossid (velvety free-tailed bat)		South America
<i>V. schilleri</i> (syn. <i>Hymenolepis</i>)	Eulipotyphla: soricid (cinereus shrew)		North America
<i>V. schmidti</i>	Chiroptera: hipposiderid (rufous trident bat)		Africa, Middle-East
<i>V. sessilihamatus</i>	Eulipotyphla: soricid (Asian house shrew)		Asia
<i>V. shirotanii</i>	Chiroptera: rhinolophid (Japanese greater horseshoe bat)		Japan
<i>V. siamensis</i>	Chiroptera: hipposiderid (great roundleaf bat)		Thailand
<i>V. sichuanensis</i>	Chiroptera: rhinolophid (little Japanese horseshoe bat)		
<i>V. sinensis</i> (syn. <i>Hymenolepis</i>)	Rodentia: cricetid (Chinese hamster)		Asia
<i>V. skrjabinariana</i>	Chiroptera: vespertilionid (serotine bat)		Russia
<i>V. solisoricis</i>	Eulipotyphla: soricid (Pearson's long-clawed shrew)		Sri Lanka
<i>V. somariensis</i>	Passeriformes: leiothrichid (jungle babbler)		India
<i>V. soriculi</i>	Eulipotyphla: soricid (Taiwanese brown-toothed shrew)		Asia
<i>V. spasskii</i>	Chiroptera: vespertilionid (common noctule)		Russia
<i>V. stefanski</i>	Eulipotyphla: soricid (common shrew)		Russia
<i>V. stenocephala</i>	Chiroptera: vespertilionid (birdlike noctule)		Japan
<i>V. sunci</i> (syn. <i>Hymenolepis</i>)	Eulipotyphla: soricid (Asian house shrew)		Asia
<i>V. tadaridae</i>	Chiroptera: molossid (wrinkle-lipped free-tailed bat)		Japan
<i>V. taiwanensis</i>	Chiroptera: miniopterid (eastern bent-wing bat)		Thailand
<i>V. tanegashimensis</i>	Chiroptera: vespertilionid (eastern long-fingered bat)		Japan
<i>V. taruiensis</i> (syn. <i>Rodentolepis</i>)	Chiroptera: rhinolophid (little Japanese horseshoe bat)		Japan
<i>V. temmincki</i>	Chiroptera: molossid (dwarf dog-faced bat)		South America
<i>V. tookokuensis</i>	Chiroptera: vespertilionid (birdlike noctule)		Japan
<i>V. uchimakiensis</i>	Chiroptera: vespertilionid (Ikonnikov's bat)		Japan
<i>V. uncinispinosa</i> (syn. <i>Hymenolepis</i>)	Rodentia: murid (Guinea multimammate mouse, Peter's striped mouse, Temminck's striped mouse, Edward's swamp rat)		Africa
<i>V. urawaensis</i>	Chiroptera: vespertilionid (Japanese house bat)		Japan
<i>V. versihamata</i>	Chiroptera: rhinolophid (intermediate horseshoe bat)		Thailand
<i>V. virilis</i> (syn. <i>Hymenolepis</i>)	Eulipotyphla: soricid (Trowbridge's shrew)		North America
<i>V. wakasensis</i>	Chiroptera: vespertilionid (eastern long-fingered bat)		Japan
<i>V. wislockii</i>	Eulipotyphla: solenodontid (Hispaniolan solenodon)		Central America
<i>V. yakushimaensis</i>	Chiroptera: vespertilionid (Ussuri tube-nosed bat)		Japan

<i>V. yoshiyukiae</i>	Chiroptera: vespertilionid (fraternal myotis)		Japan
-----------------------	---	--	-------

Reassigned hymenolepid species	Definitive host [adults in intestines] [some forming cercocysts in tissues]	Intermediate hosts [cysticercoids in tissues]	Distribution
<i>H. abortiva</i> (now <i>Abortilepis</i>)	Anseriformes: anatid (mallard, red-breasted merganser, tufted duck, northern shoveler)		Holarctic
<i>H. aduncihami</i> (now <i>Staphylocystis</i>)	Eulipotyphla: soricid (Bottego's shrew)		Africa
<i>H. aequabilis</i> (now <i>Wardium</i>)	Anseriformes: anatid (common goldeneye, whooper swan, mute swan, greater scaup)		Holarctic
<i>H. alpestris</i> (now <i>Staphylocystis</i>)	Eulipotyphla: soricid (Eurasian water shrew)		Eurasia
<i>H. ambigua</i> (now <i>Parvitaenia</i>)	Otidiformes: otidid (little bustard)		Eurasia
<i>H. amphitricha</i> (now <i>Limnolepis</i>)	Charadriiformes: scolopacid (common sandpiper, red knot, common snipe, sanderling, dunlin, purple sandpiper, Temminck's stint, Eurasian woodcock, wood sandpiper, common redshank)		cosmopolitan
<i>H. anatina</i> (now <i>Drepanidotaenia</i>)	Anseriformes: anatid (northern pintail, mallard, greylag goose, gadwall, mute swan, tufted duck, northern shoveler); Galliformes: phasianid (grey partridge); Gruiformes: rallid (Eurasian coot)		Holarctic
<i>H. anceps</i> (now <i>Dicranotaenia</i>)	Anseriformes: anatid (red-breasted merganser)		Holarctic
<i>H. annandalei</i> (now <i>Limnolepis</i>)	Charadriiformes: scolopacid (black-tailed godwit)		Eurasia, Africa, Australasia
<i>H. anthocephalus</i> (now <i>Cryptocotylepis</i>)	Eulipotyphla: soricid (northern short-tailed shrew)		North America
<i>H. arcuata</i> (now <i>Microsomacanthus</i>)	Anseriformes: anatid (common pochard, greater scaup)		Holarctic
<i>H. ardeae</i> (now <i>Gryporhynchus</i>)	Pelecaniformes: ardeid (striated heron, green heron)		Americas
<i>H. bacillaris</i> (now <i>Staphylocystis</i>)	Eulipotyphla: soricid (grey musk shrew), talpid (European mole, eastern mole)		Eurasia, North America
<i>H. bauchei</i> (now <i>Dilepidoides</i>)	Galliformes: phasianid (chicken)		Europe
<i>H. beringiensis</i> (now <i>Arostrilepis</i>)	Rodentia: cricetid (Siberian brown lemming)		Eurasia
<i>H. bettongiae</i> (now <i>Potorolepis</i>)	Diprotodontia: potoroid (eastern bettong)		Australia
<i>H. biaculeata</i> (now <i>Amphipetrovia</i>)	Anseriformes: anatid (Egyptian goose)		Africa
<i>H. bilateralis</i> (now <i>Laterorchites</i>)	Anseriformes: anatid (brant goose)		North America
<i>H. bilharzii</i> (now <i>Variolepis</i>)	Passeriformes: dicrurid (black drongo), malaconotid (black-crowned tchagra), muscicapid (rufous-tailed scrub robin)		Eurasia, Africa
<i>H. bisaccata</i> (now <i>Sobolevicanthus</i>)	Anseriformes: anatid (Brazilian teal, muscovy duck)		South America
<i>H. bisacculina</i> (now <i>Parabisaccanthes</i>)	Anseriformes: anatid (black swan)		Australia
<i>H. brachycephala</i> (now <i>Monosaccacanthus</i>)	Charadriiformes: haematopodid (Eurasian oystercatcher), scolopacid (ruff)		Eurasia
<i>H. brasiliensis</i> (now <i>Variolepis</i>)	Caprimulgiformes: caprimulgid (chuck-will's-widow, band-tailed nighthawk)		Americas
<i>H. brevicirrosus</i> (now <i>Microsomacanthus</i>)	Passeriformes: paradisaeid (twelve-wired bird of paradise)		New Guinea
<i>H. cantaniana</i> (now <i>Staphylepis</i>)	Galliformes: phasianid (chicken, turkey, Indian peafowl, ring-necked pheasant), numidid (helmeted guineafowl)	beetles	Europe, Africa, America

<i>H. capellae</i> (now <i>Limnolepis</i>)	Charadriiformes: scolopacid (common snipe)		Eurasia
<i>H. capillaris</i> (now <i>Variolepis</i>)	Gaviiformes: gaviid (black-throated loon, common loon); Podicipediformes: podicipedid (horned grebe, great crested grebe, red-necked grebe, black-necked grebe)		Arctic
<i>H. capillaroides</i> (now <i>Variolepis</i>)	Podicipediformes: podicipedid (least grebe)		Americas
<i>H. caprimulgorum</i> (now <i>Variolepis</i>)	Caprimulgiformes: caprimulgid (jungle nightjar, sand-coloured nighthawk, <i>Nacunda</i> nighthawk)		India, Americas
<i>H. carioca</i> (now <i>Echinolepis</i>)	Galliformes: phasianid (chicken, turkey, grey partridge)	Coleoptera: carabid (<i>Anisotarsus agilis</i>), scarabaeid (<i>Aphodius granaruis</i> , <i>Choeridium histeroides</i>), histerid (<i>Carcinops quatuordecimstriata</i>); Diptera: muscid (<i>Stomoxys calcitrans</i>)	worldwide
<i>H. caroli</i> (now <i>Retinometra</i>)	Phoenicoptiformes: phoenicopterid (greater flamingo)		Africa
<i>H. charadrii</i> (now <i>Nadejdolepis</i>)	Charadriiformes: charadriid (Kentish plover)		Eurasia
<i>H. chionis</i> (now <i>Limnolepis</i>)	Charadriiformes: chionid (snowy sheathbill)		Antarctic
<i>H. chrysochloridis</i> (now <i>Staphylocystis</i>)	Afrosoricida: chrysochlorid (Cape golden mole)		Africa
<i>H. clandestina</i> (now <i>Wardium</i>)	Charadriiformes: haematopodid (Eurasian oystercatcher)		Eurasia
<i>H. clausa</i> (now <i>Aploparaksis brachyphallos</i>)	Anseriformes: anatid (lesser whistling duck); Columbiformes: columbid (rock dove)		Eurasia
<i>H. clerici</i> (now <i>Aploparaksis</i>)	Passeriformes: muscicapid (pied flycatcher), passerid (Eurasian tree sparrow)		Eurasia
<i>H. collaris</i> (now <i>Myxolepis</i>)	Anseriformes: anatid (northern pintail, Eurasian teal, mallard, Indian spot-billed duck, greylag goose, Eurasian wigeon, greater scaup, tufted duck, northern shoveler, Pacific black duck, Australian teal, magpie goose)	Copepoda: cyclopoid (<i>Acanthocyclops bicuspidatus</i> , <i>vernalis</i> , <i>viridis</i> , <i>Cyclops lucidulus</i> , <i>strenuus</i> , <i>Eucyclops agilis</i> , <i>serrulatus</i> , <i>Mesocyclops leuckarti</i> , <i>oithonoides</i> , <i>Diaptomus coeruleus</i>); Amphipoda: gammarid (<i>Gammarus pulex</i>)	Eurasia, Australia
<i>H. columbina</i> (now <i>Variolepis</i>)	Columbiformes: columbid (Namaqua dove)		Africa
<i>H. compressa</i> (now <i>Microsomacanthus</i>)	Anseriformes: anatid (northern pintail, Brazilian teal, mallard, greylag goose, Eurasian wigeon, common pochard, tufted duck, greater scaup, canvas-back duck, black scoter)		Holarctic
<i>H. conscripta</i> (now <i>Microsomacanthus</i>)	Anseriformes: anatid (greylag goose)		Europe
<i>H. coronoidis</i> (now <i>Variolepis</i>)	Passeriformes: corvid (Philippine crow)		Philippines
<i>H. coronula</i> (now <i>Dicranotaenia</i>)	Anseriformes: anatid (mallard, greylag goose, common goldeneye, long-tailed duck, mandarin duck, Eurasian wigeon, surf scoter, greater scaup, white-headed duck, common shelduck)		Holarctic
<i>H. corvi</i> (now <i>Dicranotaenia</i>)	Passeriformes: corvid (American crow)		Americas
<i>H. crenata</i>	Piciformes: picid (black woodpecker)		Eurasia

(now <i>Passerilepis</i>)			
<i>H. creplini</i> (now <i>Wardium</i>)	Anseriformes: anatid (greater white-fronted goose, greylag goose, whooper swan)		Eurasia
<i>H. curiosa</i> (now <i>Anatinella</i>)	Anseriformes: anatid (black swan)		Australia
<i>H. cyrtoides</i> (now <i>Retinometra</i>)	Anseriformes: anatid (ruddy duck)		North America
<i>H. dahurica</i> (now <i>Passerilepis</i>)	Passeriformes: corvid (Eurasian jackdaw)		Eurasia
<i>H. diaphana</i> (now <i>Soricinia</i>)	Eulipotyphla: soricid (common shrew, Eurasian pygmy shrew)		Eurasia
<i>H. diorchis</i> (now <i>Microsomacanthus</i>)	Anseriformes: anatid (common eider)		Holarctic
<i>H. dolosa</i> (now <i>Echinocotyle</i>)	Passeriformes: viduid (village indigobird, pin-tailed whydah), ploceid (orange weaver), estrildid (bronze mannikin)		Africa
<i>H. ductilis</i> (now <i>Microsomacanthus</i>)	Charadriiformes: larid (European herring gull, great black-backed gull)		Holarctic
<i>H. echinocotyle</i> (now <i>Echinocotyle</i>)	Anseriformes: anatid (mallard, ruddy shelduck, northern shoveler)		Holarctic
<i>H. elongata</i> (now <i>Drepanidotaenia</i>)	Pelecaniformes: threskiornithid (plumbeous ibis)		South America
<i>H. falsata</i> (now <i>Hispaniolepis</i>)	Otidiformes: otidid (houbara bustard)		Africa
<i>H. farciminosa</i> (now <i>Variolepis</i>)	Passeriformes: sturnid (common myna, common starling, black-collared starling, spotless starling), corvid (Eurasian jay, Eurasian magpie), icterid (Baltimore oriole), turdid (thrush)		Eurasia, North America
<i>H. fausti</i> (now <i>Dicranotaenia</i>)	Anseriformes: anatid (mallard)		Europe
<i>H. fedtschenkowii</i> (now <i>Hispaniolepis</i>)	Galliformes: phasianid (chicken, Himalayan snowcock)		Eurasia
<i>H. filirostris</i> (now <i>Microsomacanthus</i>)	Pelecaniformes: threskiornithid (Eurasian spoonbill)		Eurasia
<i>H. fista</i> (now <i>Retinometra</i>)	Anseriformes: anatid (cotton pygmy goose)		Asia
<i>H. flagellata</i> (now <i>Sobolevicanthus</i>)	Anseriformes: anatid (white-cheeked pintail)		Americas
<i>H. flamingo</i> (now <i>Flamingolepis</i>)	Phoenicoptiformes: phoenicopterid (greater flamingo)		Africa
<i>H. fola</i> (now <i>Passerilepis</i>)	Charadriiformes: rostratulid (greater painted-snipe)		Asia, Africa
<i>H. francolini</i> (now <i>Microsomacanthus</i>)	Galliformes: phasianid (Chinese francolin)		Asia
<i>H. fryei</i> (now <i>Dicranotaenia</i>)	Charadriiformes: larid (glaucous-winged gull)		North America
<i>H. fulleborni</i> (now <i>Staphylocystis</i>)	Eulipotyphla: soricid (musk shrew)		Africa
<i>H. furcata</i> (now <i>Staphylocystis</i>)	Eulipotyphla: soricid (common shrew, musk shrew, white-toothed shrew, Eurasian pygmy shrew)		Eurasia
<i>H. furcifera</i> (now <i>Variolepis</i>)	Podicipediformes: podicipedid (horned grebe, great crested grebe, red-necked grebe, black-necked grebe, little grebe)		Arctic
<i>H. giranensis</i> (now <i>Retinometra</i>)	Anseriformes: anatid (mallard)		Europe
<i>H. globocephala</i> (now <i>Variolepis</i>)	Passeriformes: zosteropid (silveryeye)		Pacific
<i>H. globosa</i> (now <i>Soricinia</i>)	Eulipotyphla: soricid (Eurasian water shrew)		Eurasia
<i>H. globulosa</i> (now <i>Armadoskrjabinia</i>)	Anseriformes: anatid (black swan)		Australia

<i>H. gracilis</i> (now <i>Sobolevicanthus</i>)	Anseriformes: anatid (common teal, mallard, greylag goose, gadwall, Eurasian wigeon, common merganser, red-breasted merganser, common pochard, greater scaup, northern shoveler, common shelduck); Otidiformes: otidid (houbara bustard)		Holarctic, Africa
<i>H. groenlandica</i> (now <i>Aploparaksis</i>)	Anseriformes: anatid (long-tailed duck)		Holarctic
<i>H. haldemani</i> (now <i>Branchiopodataenia</i>)	Charadriiformes: larid (Sabine's gull)		North America
<i>H. hamulacanthos</i> (now <i>Retinometra</i>)	Anseriformes: anatid (redhead)		North America
<i>H. hassalli</i> (now <i>Variolepis</i>)	Cuculiformes: cuculid (bronze cuckoo)		Europe
<i>H. hemignathi</i> (now <i>Passerilepis</i>)	Passeriformes: fringillid (Kauai 'akialoa)		Hawaii
<i>H. himantopodis</i> (now <i>Wardium</i>)	Charadriiformes: scolopacid (red knot), charadriid (Wilson's plover), recurvirostrid (black-winged stilt, pied avocet)		cosmopolitan
<i>H. horrida</i> (now <i>Aostrilepis</i>)	Rodentia: cricetid (montane water vole, field vole, common vole, European water vole), murid (Shaw's jird, Eurasian harvest mouse, brown rat), geomyid (Botta's pocket gopher, mountain pocket gopher, northern pocket gopher)		Europe, Africa, North America
<i>H. infirma</i> (now <i>Insectivorolepis</i>)	Eulipotyphla: soricid (common shrew, Eurasian pygmy shrew)		Europe
<i>H. inhamata</i> (now <i>Staphylepis</i>)	Apodiformes: trochilid (swallow-tailed hummingbird)		South America
<i>H. innominata</i> (now <i>Polycercus</i>)	Charadriiformes: recurvirostrid (pied avocet)		Eurasia
<i>H. interrupta</i> (now <i>Passerilepis</i>)	Charadriiformes: scolopacid (Eurasian woodcock)		Eurasia
<i>H. jacutensis</i> (now <i>Skrjabinacantha</i>)	Eulipotyphla: soricid (common shrew, Eurasian pygmy shrew)		Europe
<i>H. jaenschi</i>	Pelecaniformes: pelecanid (Australian pelican)		Australia
<i>H. jagerskioldi</i> (now <i>Microsomacanthus</i>)	Anseriformes: anatid (mallard, velvet scoter, common eider)		Eurasia
<i>H. japonica</i> (now <i>Variolepis</i>)	Podicipediformes: podicipedid (little grebe)		Europe
<i>H. khalili</i> (now <i>Staphylocystis</i>)	Eulipotyphla: soricid (common shrew)		Europe
<i>H. kowalewski</i> (now <i>Wardium</i>)	Anseriformes: anatid (tufted duck); Gruiformes: rallid (Eurasian coot)		Eurasia
<i>H. krabbeella</i> (now <i>Sobolevicantha</i>)	Anseriformes: anatid (Eurasian teal, gadwall, common pochard)		Eurasia
<i>H. lamellata</i> (now <i>Staphylepis</i>)	Anseriformes: anatid (Radjah shelduck)		Australasia
<i>H. lanceolata</i> (now <i>Drepanidotaenia</i>)	Anseriformes: anatid (mallard, American black duck, greylag goose, brant, muscovy, whooper swan, red-crested pochard, common pochard, white-headed duck, black swan, African teal); Phoenicopteriformes: phoenicopterid (flamingo); Podicipediformes: podicipedid (grebe); Primates: hominid (human)	freshwater Copepoda: diaptomid (<i>Diaptomus sinosus</i>), cyclopid (<i>Cyclops</i>)	worldwide
<i>H. lateralis</i> (now <i>Laricanthus</i>)	Charadriiformes: larid (glaucous-winged gull)		North America
<i>H. liguloides</i> (now <i>Flamingolepis</i>)	Phoenicopteriformes: phoenicopterid (greater flamingo)		Africa
<i>H. lintoni</i> (now <i>Retinometra</i>)	Anseriformes: anatid (red-breasted merganser)		Holarctic
<i>H. lobulata</i> (now <i>Lobatolepis</i>)	Podicipediformes: podicipedid (pied-billed grebe)		Americas

<i>H. longicirrosa</i> (now <i>Cladogynia</i>)	Anseriformes: anatid (Eurasian teal, taiga bean goose, swan goose)		Eurasia
<i>H. longistylota</i> (now <i>Retinometra</i>)	Anseriformes: anatid (taiga bean goose)		Eurasia
<i>H. longivaginata</i> (now <i>Hymenophenocanthus</i>)	Anseriformes: anatid (barnacle goose)		Holarctic
<i>H. loossi</i> (now <i>Staphylocystis</i>)	Eulipotyphla: soricid (musk shrew)		Africa
<i>H. macracanthos</i> (now <i>Retinometra</i>)	Anseriformes: anatid (common goldeneye, red-breasted merganser)		Holarctic
<i>H. magniovata</i> (now <i>Microsomacantha</i>)	Passeriformes: monarchid (Melanesian flycatcher)		Melanesia
<i>H. magnisaccis</i> (now <i>Najedolepis</i>)	Charadriiformes: scolopacid (little stint)		Eurasia
<i>H. magniuncinata</i> (now <i>Armadoskrjabinia</i>)	Pelecaniformes: pelecanid (great white pelican)		Eurasia
<i>H. mayhewi</i> (now <i>Microsomacantha</i>)	Anseriformes: anatid (common goldeneye)		Holarctic
<i>H. medici</i> (now <i>Echinorhynchotaenia</i>)	Pelecaniformes: pelecanid (great white pelican, pink-backed pelican)		Eurasia, Africa
<i>H. megalorchis</i> (now <i>Cladogynia</i>)	Phoenicopteriformes: phoenicopterid (greater flamingo)		Africa
<i>H. meggitti</i> (now <i>Retinometra</i>)	Anseriformes: anatid (goose)		Europe
<i>H. microcirrosa</i> (now <i>Dicranotaenia</i>)	Passeriformes: turdid (American robin)		North America
<i>H. microps</i> (now <i>Paradicranotaenia</i>)	Galliformes: phasianid (greater sage-grouse, red grouse, black grouse, western capercaillie)		North America, Eurasia
<i>H. microscolecina</i> (now <i>Variolepis</i>)	Passeriformes: cotingid (Guianan cock-of-the-rock)		South America
<i>H. multiglandularis</i> (now <i>Echinocotyle</i>)	Charadriiformes: larid (lesser black-backed gull)		Holarctic, Africa
<i>H. multihamata</i> (now <i>Skrjabinolepis</i>)	Accipitriformes: accipitrid (black kite)		Eurasia
<i>H. muris-sylvatici</i> (now <i>Staphylocystis</i>)	Rodentia: murid (wood mouse)		Europe
<i>H. musculosa</i> (now <i>Dicranotaenia</i>)	Galliformes: phasianid (turkey)		Europe
<i>H. nagaty</i> (now <i>Hilmylepis</i>)	Eulipotyphla: soricid (musk shrew)		Eurasia
<i>H. naja</i> (now <i>Capiuterilepis</i>)	Passeriformes: certhiid (Eurasian treecreeper), sittid (Eurasian nuthatch)		Eurasia
<i>H. neoarctica</i> (now <i>Dicranotaenia</i>)	Charadriiformes: larid (European herring gull, great black-backed gull)		Holarctic
<i>H. nishidai</i> (now <i>Paramilinia</i>)	Chiroptera: rhinolophid (Japanese greater horseshoe bat)		Japan
<i>H. nitidulans</i> (now <i>Najedolepis</i>)	Charadriiformes: scolopacid (dunlin), charadriid (common ringed plover); Passeriformes: turdid (common blackbird); Anseriformes: anatid (greater scaup)		Holarctic
<i>H. nyrocae</i> (now <i>Drepanidotaenia</i>)	Anseriformes: anatid (mallard, greater scaup)		Eurasia
<i>H. obvelata</i> (now <i>Octacanthus</i>)	Pteroclitiformes: pteroclid (pin-tailed sandgrouse)		Eurasia
<i>H. octacanthoides</i> (now <i>Sobolevicanthus</i>)	Charadriiformes: larid (black-headed gull)		Holarctic
<i>H. oena</i> (now <i>Passerilepis</i>)	Columbiformes: columbid (Namaqua dove)		Africa
<i>H. omissa</i> (now <i>Coronacanthus</i>)	Eulipotyphla: soricid (Eurasian water shrew)		Eurasia

<i>H. orientalis</i> (now <i>Aploparaksis</i>)	Passeriformes: muscicapid (northern wheatear)		Europe
<i>H. orthacantha</i> (now <i>Variolepis</i>)	Anseriformes: anatid (Coscoroba swan)		South America
<i>H. oshimai</i> (now <i>Retinometra</i>)	Anseriformes: anatid (mallard)		Asia
<i>H. oweni</i> (now <i>Echinocotyle</i>)	Charadriiformes: scolopacid (ruff)		Eurasia
<i>H. pachycephala</i> (now <i>Microsomacanthus</i>)	Anseriformes: anatid (harlequin duck)		North America
<i>H. papillata</i> (now <i>Sobolevicanthus</i>)	Anseriformes: anatid (muscovy)		North America
<i>H. paramicrosoma</i> (now <i>Microsomacanthus</i>)	Anseriformes: anatid (mallard, tufted duck)		Holarctic
<i>H. parina</i> (now <i>Passerilepis</i>)	Passeriformes: parid (great tit, coal tit)		Eurasia, Africa
<i>H. parviceps</i> (now <i>Dicranotaenia</i>)	Anseriformes: anatid (red-breasted merganser)		Holarctic
<i>H. parviuncinata</i> (possibly <i>Taenia</i>)	Pelecaniformes: pelecanid (great white pelican)		Eurasia
<i>H. parvula</i> (now <i>Microsomacanthus</i>)	Anseriformes: anatid (mallard)		Europe
<i>H. passerina</i> (now <i>Passerilepis</i>)	Passeriformes: turdid (thrush)		Europe
<i>H. passeris</i> (now <i>Passerilepis</i>)	Passeriformes: aegithalid (long-tailed tit), parid (Eurasian blue tit, European crested tit, great tit, coal tit, marsh tit), passerid (house sparrow, Eurasian tree sparrow), fringillid (common chaffinch, brambling, common linnet, Eurasian siskin), panurid (bearded reedling), sylviid (warbler); Accipitriformes: accipitrid (Eurasian sparrowhawk)		Eurasia, Africa
<i>H. pauciannulata</i> (now <i>Microsomacanthus</i>)	Anseriformes: anatid (northern shoveler)		Holarctic
<i>H. pauciovata</i> (now <i>Microsomacanthus</i>)	Tinamiformes: tinamid (red-legged tinamou)		South America
<i>H. pellucida</i> (now <i>Passerilepis</i>)	Passeriformes: icterid (oropendola, crested oropendola)		Central and South America
<i>H. peramelidarum</i> (syn. <i>Vampirolepis</i>) (now <i>Potorolepis</i>)	Peramelemorphia: peramelid (northern brown bandicoot, southern brown bandicoot, long-nosed bandicoot)		Australia
<i>H. peteri</i> (now <i>Lophurolepis</i>)	Rodentia: murid (rusty-bellied brush-furred rat)		Africa
<i>H. phalacrocoracis</i> (now <i>Woodlandia phalacrocorax</i>)	Suliformes: phalacrocoracid (great cormorant)		Eurasia, North America
<i>H. phasianina</i> (now <i>Mayhewia</i>)	Galliformes: phasianid (red-legged partridge, grey partridge, ring-necked pheasant)		Eurasia
<i>H. pingi</i> (now <i>Dicranotaenia</i>)	Anseriformes: anatid (taiga bean goose)		Eurasia
<i>H. pistillum</i> (now <i>Staphylocystis</i>)	Eulipotyphla: soricid (greater white-toothed shrew, common shrew, alpine shrew)		Europe, Africa
<i>H. pittalugai</i> (now <i>Retinometra</i>)	Anseriformes: anatid (common goldeneye)		North America
<i>H. planestici</i> (now <i>Variolepis</i>)	Passeriformes: sturnid (common myna, American robin)		Americas
<i>H. podicipina</i> (now <i>Variolepis</i>)	Podicipediformes: podicipedid (horned grebe, great crested grebe, black-necked grebe)		Arctic
<i>H. polyacantha</i> (now <i>Echinocotyle</i>)	Eulipotyphla: soricid (Eurasian water shrew)		Eurasia
<i>H. porale</i> (now <i>Dicranotaenia</i>)	Charadriiformes: glareolid (collared pratincole)		Africa

<i>H. porzana</i> (now <i>Aploparaksis</i>)	Gruiformes: rallid (spotted crane)		Eurasia
<i>H. przewalskii</i> (now <i>Drepanidotaenia</i>)	Anseriformes: anatid (greylag goose)		Europe
<i>H. pycnonoti</i> (now <i>Variolepis</i>)	Passeriformes: pycnonotid (yellow-vented bulbul)		Indochina
<i>H. querquedula</i> (now <i>Dicranotaenia</i>)	Anseriformes: anatid (Eurasian teal)		Eurasia
<i>H. raillieti</i> (now <i>Hilmylepis</i>)	Eulipotyphla: soricid (greater white-toothed shrew)		Europe
<i>H. rapida</i> (now <i>Drepanidotaenia</i>)	Anseriformes: anatid (black swan)		Australia
<i>H. rara</i> (now <i>Microsomacanthus rarus</i>)	Anseriformes: anatid (red-crested pochard)		Eurasia
<i>H. rectacantha</i> (now <i>Microsomacanthus</i>)	Charadriiformes: charadriid (common ringed plover)		Eurasia
<i>H. recurvirostrae</i> (now <i>Wardium</i>)	Charadriiformes: recurvirostrid (black-winged stilt, pied avocet)		Eurasia, Africa
<i>H. retracta</i> (now <i>Wardium</i>)	Anseriformes: anatid (king eider)		Holarctic
<i>H. rhodesiensis</i> (now <i>Schmelzia</i>)	Piciformes: lybiid (black-collared barbet)		Africa
<i>H. riggenbachi</i> (now <i>Dicranotaenia</i>)	Anseriformes: anatid (red-crested pochard)		Eurasia
<i>H. rosethali</i> (now <i>Octacanthum</i>)	Pteroclitiformes: pteroclid (pin-tailed sandgrouse)		Eurasia
<i>H. rostellata</i> (now <i>Microsomacanthus</i>)	Gaviiformes: gaviid (black-throated loon, common loon, red-throated loon); Podicipediformes: podicipedid (red-necked grebe)		Arctic
<i>H. sagitta</i> (now <i>Drepanidotaenia</i>)	Anseriformes: anatid (mallard)		Europe
<i>H. scalaris</i> (now <i>Staphylocystis</i>)	Eulipotyphla: soricid (greater white-toothed shrew, common shrew)		Europe, Africa
<i>H. schaldybini</i> (now <i>Neoskrjabinolepis</i>)	Eulipotyphla: soricid (common shrew, Eurasian pygmy shrew)	Coleoptera: staphylinid (<i>Anthobium unicolor</i>)	Europe
<i>H. scutigera</i> (now <i>Monopylidium</i>)	Eulipotyphla: soricid (common shrew, Eurasian pygmy shrew)		Europe
<i>H. sengeri</i> (now <i>Lineolepis</i>)	Eulipotyphla: soricid (marsh shrew)		North America
<i>H. serpentulus</i> (now <i>Mayhewia</i>)	Passeriformes: sturnid (crested myna), motacillid (tree pipit), corvid (western jackdaw, common raven, hooded crow, carrion crow, collared crow, Eurasian jay, Eurasian magpie, spotted nutcracker, rook), icterid (Baltimore oriole), alaudid (crested lark), turdid (wood thrush, common thrush, black-throated thrush, American robin, fieldfare, ring ouzel, mistle thrush), laniid (woodchat shrike), muscicapid (spotted flycatcher), sturnid (common starling)		Eurasia, Africa, North America
<i>H. serrata</i> (now <i>Retinometra</i>)	Columbiformes: columbid (speckled pigeon, rock dove, European turtle dove, Oriental turtle dove, red turtle dove, laughing dove, spotted dove)		Eurasia, Africa
<i>H. setigera</i> (now <i>Vigissotaenia</i>)	Anseriformes: anatid (mallard, greater white-fronted goose, greylag goose, taiga bean goose, brant goose, barnacle goose, whooper swan, mute swan, pochard, tufted duck); Gruiformes: rallid (Eurasian coot)		Holarctic
<i>H. sibirica</i> (now <i>Staphylocystis</i>)	Anseriformes: anatid (king eider)		Holarctic
<i>H. simplex</i>	Anseriformes: anatid (northern pintail, Eurasian)		Holarctic

(now <i>Dicranotaenia</i>)	teal, common shelduck)		
<i>H. singularis</i> (now <i>Neoskrjabinolepis</i>)	Eulipotyphla: soricid (common shrew, Eurasian pygmy shrew)		Europe
<i>H. solitaria</i> (now <i>Pseudohymenolepis</i>)	Eulipotyphla: soricid (musk shrew)		Europe
<i>H. soricis</i> (now <i>Soricinia</i>)	Eulipotyphla: soricid (alpine shrew)		Europe
<i>H. southwelli</i> (now <i>Australiolepis</i>)	Anseriformes: anatid (black swan)		Australia
<i>H. spinulosa</i> (now <i>Vigisolepis</i>)	Eulipotyphla: soricid (common shrew, musk shrew)		Europe
<i>H. streptopeliae</i> (now <i>Passerilepis</i>)	Columbiformes: columbid (ring-necked dove, Oriental turtle dove)		Eurasia, Africa
<i>H. styloides</i> (now <i>Microsomacanthus</i>)	Charadriiformes: scolopacid (common snipe), pluvianid (Egyptian plover), rostratulid (greater painted-snipe)		Eurasia, Africa
<i>H. taiwanensis</i> (now <i>Passerilepis</i>)	Pelecaniformes: ardeid (purple heron)		Asia
<i>H. tenerrima</i> (now <i>Retinometra</i>)	Anseriformes: anatid (greater scaup)		Holarctic
<i>H. tenuirostris</i> (now <i>Anatinella</i>)	Anseriformes: anatid (mallard, greylag goose, velvet scoter, smew, common merganser, red-breasted merganser, tufted duck, greater scaup, common eider); Charadriiformes: larid (black-legged kittiwake)		Holarctic
<i>H. teresoides</i> (now <i>Hamatolepis</i>)	Anseriformes: anatid (gadwall)		Holarctic
<i>H. terraereginae</i> (now <i>Sobolevicanthus</i>)	Anseriformes: anatid (magpie goose)		Australia
<i>H. tetracis</i> (now <i>Hispaniolepis</i>)	Otidiformes: otidid (little bustard)		Eurasia
<i>H. tiara</i> (now <i>Staphylocystis</i>)	Eulipotyphla: soricid (greater white-toothed shrew, common shrew)		Europe, Africa
<i>H. tonkinensis</i> (now <i>Staphylepis</i>)	Cuculiformes: cuculid (square-tailed drongocuckoo)		Asia
<i>H. trichorhyncha</i> (now <i>Dicranotaenia</i>)	Anseriformes: anatid (Eurasian teal)		Eurasia
<i>H. trifolium</i> (now <i>Microsomacanthus</i>)	Anseriformes: anatid (mallard)		Europe
<i>H. tubicirrosa</i> (now <i>Armadoskrjabinia</i>)	Cariamiformes: cariamid (red-legged seriema)		South America
<i>H. urceus</i> (now <i>Paradilepis</i> (syn) <i>Meggittiella</i>)	Pelecaniformes: pelecanid (great white pelican), threskiornithid (glossy ibis, Eurasian spoonbill, plumbeous ibis)		Eurasia
<i>H. vaginata</i> (now <i>Avocetolepis</i>)	Charadriiformes: recurvirostrid (pied avocet)		Eurasia
<i>H. vallei</i> (now <i>Nadejdolepis</i>)	Charadriiformes: scolopacid (little stint, long-toed stint)		Holarctic
<i>H. variabilis</i> (now <i>Variolepis</i>)	Passeriformes: corvid (American crow)		Americas
<i>H. varicanthos</i> (now <i>Paradilepis</i>)	Pelecaniformes: threskiornithid (ibis)		Eurasia
<i>H. varsoviensis</i> (now <i>Dicranotaenia</i>)	Charadriiformes: scolopacid (dunlin)		Holarctic
<i>H. venusta</i> (now <i>Retinometra</i>)	Anseriformes: anatid (mallard)		Europe
<i>H. villosa</i> (now <i>Hispaniolepis</i>)	Galliformes: phasianid (chicken, black grouse, western capercaillie, Himalayan snowcock); Otidiformes: otidid (houbara bustard, great bustard, little bustard)		Eurasia, Africa
<i>H. villosoides</i> (now <i>Hispaniolepis</i>)	Anseriformes: anatid (tufted duck, greater scaup)		Eurasia

<i>H. woodsholei</i> (now <i>Variolepis</i>)	Podicipediformes: podicipedid (horned grebe, red-necked grebe)		Arctic
<i>H. zosteropsis</i> (now <i>Passerilepis</i>)	Passeriformes: leiothrichid (white-throated laughingthrush)		Asia
<i>R. gnoskei</i> (now <i>Pararodentolepis</i>)	Eulipotyphla: soricid (lesser dwarf shrew)		Africa
<i>V. heleni</i> (now <i>Neomylepis</i>)	Eulipotyphla: soricid (Eurasian water shrew)		Eurasia

Parasite morphology: Hymenolepid tapeworms form 3 different sequential stages in their developmental cycles: eggs, larvae (cysticeroids) and adults. Eggs have a colourless to yellow transparent shell and are round to oval in shape and quite variable in size ranging from 30-90 μm in length (those of *H. nana* are smaller than *H. diminuta*, 30-50 cf. 60-90 μm). Each egg contains a non-ciliated hexacanth (6-hooked) oncosphere (embryo) enclosed in thin inner membrane and a thicker striated outer membrane. The embryophore of *H. nana* has 2 polar thickenings, each with 4-8 filaments extending into the space between membranes, while that of *H. diminuta* has neither polar thickenings nor filaments. The larval metacestode (cysticeroid) has an elongate lacunate body with a well-developed retracted scolex and a prominent broad spade-shaped tail (cercomer) containing longitudinal fibres without lateral outgrowths (modified cysticeroids with caudal appendages are also formed by some species and have been called cercocysts). Adult tapeworms are elongate with an anterior scolex, a short skinny neck and a posterior ribbon-like body (strobila) with numerous segments (proglottids). The dwarf tapeworm *H. nana* is small in size measuring 1.5-5.0 cm long and 1 mm wide even though up to 200 segments may be present, while the rat tapeworm *H. diminuta* is larger ranging from 20-60 cm long (some up to 90 cm) and containing up to 1,000 segments. Proglottids are much wider than they are long (up to 4 times wider). The scolex is globular (knob-like) and possesses 4 muscular suckers surmounted by a small retractable rostellum (which can be withdrawn into a rostellar sac). The rostellum of different *Hymenolepis* spp. varies in its armature, some species bearing 20-30 small thorn-like hooks (e.g. *H. nana*), while others are unarmed (e.g. *H. diminuta*). The rostellum of *Vampirolepis* and *Rodentolepis* spp. are armed, the former with fraternal-type hooks and the latter with cricetoid-type hooks. Adult tapeworms are hermaphroditic with each segment containing a single set of male and female reproductive organs. Mature proglottids have 3 clearly-defined testes (sometimes 1-4), large seminal vesicles, a single ovary, sacculate uterus and unilateral genital pores. Posterior proglottids become gravid (fill with up to 200 eggs) and then drop off the tapeworm body and break down in the digestive tract releasing the eggs to be passed in faeces.

Site of infection: Adult hymenolepid tapeworms infect the small intestines of their vertebrate definitive hosts, sometimes extending to the bile ducts and gall bladder. In humans, *H. nana* and *H. diminuta* preferentially infect the ileum. Larval metacestodes (cysticeroids) infect the body cavities of their invertebrate intermediate hosts, usually insects (beetles, flies, moths, fleas) although annelids (earthworms) and gastropods (snails) have occasionally been implicated in life-cycles. Most *Hymenolepis* spp. infect birds and small insectivorous mammals (rodents, shrews, primates), *Vampirolepis* spp. infect bats, and *Rodentolepis* spp. infect rodents.

Pathogenesis: Infections are generally asymptomatic but prolonged infections or heavy infections may produce clinical signs consistent with catarrhal enteritis and malabsorption. Adult tapeworms do not feed on host tissues but absorb nutrients from the gut lumen. However, their sites of attachment may cause physical damage to the gut wall and compromise gut function. Several *Hymenolepis* spp. infecting domestic poultry may cause production losses in meat and egg production due to gut inflammation, reduced absorption, nutrient depletion and retarded growth. Infections are often moderate and not pathogenic, although heavier infections cause clinical signs including diarrhoea (sometimes haemorrhagic), weight loss, emaciation, intestinal obstruction, nodular growths, ruffled and dry plumage, and sometimes death. Heavy and chronic infections may also induce stress and predispose birds to other infectious diseases. Infections in humans are predominantly associated with the dwarf tapeworm *H. nana*, and to a lesser extent the rat tapeworm *H. diminuta*, particularly common in children in developing countries with warm-temperate climates. Chronic infections by *H. nana* in children have frequently been associated with crowded environments, unsanitary conditions, institutionalized settings, nutritional disorders and immunocompromising disorders. Light to mild infections are generally asymptomatic, but very heavy infections, particularly those developing due to direct infection or auto-infection, may cause severe clinical disease characterized by enteritis, diarrhoea (sometimes bloody), abdominal pain, anal pruritus, anorexia, restlessness, irritability, weakness, insomnia, headaches, dizziness, convulsions, epileptic seizures, and behavioural disturbances. Initial symptoms are thought to be exacerbated by allergenic responses caused by tapeworm metabolic (excretory and/or secretory) products resulting in toxæmia with localized and systemic eosinophilia. This can lead to an increase in the production of toxic oxygen radicals (superoxides, hydrogen peroxide, oxidant halide) which can cause degeneration of the intestinal mucosa, oedema and villous atrophy. Some species (including *H. nana*) may also cause physical damage to the gut wall when cysticeroid stages penetrate to the submucosa where they develop and when adult worms use their armed rostellum to attach to the mucosa. The resultant trauma and accompanying inflammation impairs intestinal absorption and increases protein loss.

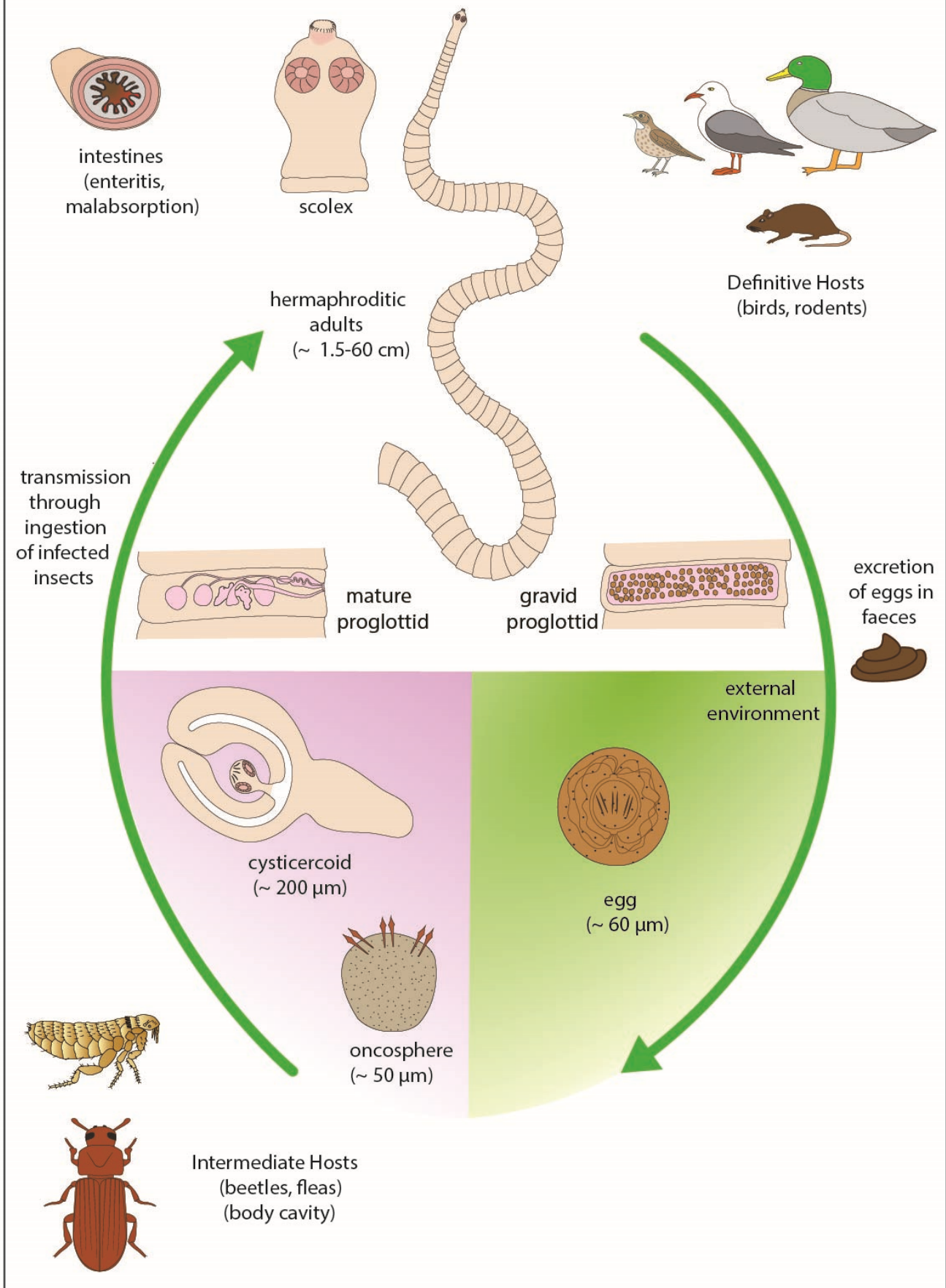
Developmental cycle and mode of transmission: Most *Hymenolepis* spp. have indirect heteroxenous aquatic or terrestrial life-cycles that involve encysted cysticeroid larvae in invertebrate intermediate hosts being transmitted to vertebrate definitive hosts via predation. Hymenolepid tapeworms often exhibit rapid development and have short lifespans, thereby contributing to their wide

distribution and abundance. Many genera and species have been reported in a wide range of definitive hosts (birds, mammals, reptiles and amphibians) and intermediate hosts (arthropods, annelids and molluscs). Gravid proglottids released from adult tapeworms may be passed in host faeces but they often disintegrate in the gut releasing eggs which are then passed in faeces. Eggs are immediately infective but can survive in the external environment for several weeks. When eggs are ingested by an invertebrate intermediate host, they hatch releasing their oncospheres which penetrate the gut wall and form larval cysticercoids in the body cavity. If the infection occurs in the larval stage of the intermediate host (e.g. beetle larvae), the encysted larval cysticercoid persists through moulting and morphogenesis into the adult stage. When infected invertebrates are eaten by definitive hosts, the cysticercoids attach to the gut wall and develop into adult tapeworms. The prepatent period (time from infection to release of first eggs) is quite variable and may range from several weeks to months, and adult tapeworms tend to live only for several months. Infections in humans are usually acquired by the ingestion of foodstuffs (often precooked cereals) contaminated with infected insects (e.g. flour beetles) or by children ingesting invertebrates from the environment. An exceptional example of transmission adaptability is shown by the dwarf tapeworm *H. nana* which may also undergo direct transmission between definitive hosts (without using intermediate hosts) and even auto-infect the same definitive host. Direct transmission occurs when definitive hosts ingest eggs which hatch releasing their oncospheres which penetrate intestinal villi to the submucosa where they develop over several days into modified cysticercoid larvae (known as cercocysts). The cercocysts then rupture the villi to emerge to the lumen where they attach to the mucosa and develop into adult worms. Auto-infection occurs when eggs hatch internally without ever leaving the host. They complete their larval development in the submucosa and emerge to the gut lumen to form adults. Direct transmission and auto-infection cycles facilitate chronic infections and the development of large worm burdens with more severe pathological consequences.

Differential diagnosis: Infections are diagnosed by the microscopic detection of tapeworm eggs in faecal samples following formol-ether concentration or floatation in saturated salt solutions (high specific gravity). Egg production is often sporadic so repeated tests are recommended to improve diagnostic sensitivity. Infections can also be diagnosed at necropsy by dissecting the small intestine in warm water to detect adult tapeworms. Various immunoserological tests (immnodiffusion, complement fixation, fluorescence, haemagglutination and enzyme immunoassays) have also been developed to detect host antibodies against *H. nana*, but they generally had low sensitivity and specificity. More recently, molecular biological techniques have been used to characterize species by polymerase chain reaction (PCR) amplification of specific gene sequences (nuclear small subunit ribosomal DNA (18S) and internal transcribed spacer regions, and mitochondrial cytochrome c oxidase subunit 1).

Treatment and control: Clinical infections have been successfully treated with broad-spectrum anthelmintics, including isoquinolines (praziquantel), benzimidazole-methylcarbamates (albendazole, mebendazole), benzimidazole-thiazolyls (thiabendazole), salicylanilides (niclosamide), and also the aminoglycoside antibiotic (paromomycin). These drugs have been shown to be effective against adult tapeworms of many hymenolepid species, but they appeared to have limited efficacy against *H. nana* cysticercoid stages developing in submucosal sites so repeated doses may be required. It is also important to remember the potential for *H. nana* to undergo direct transmission so care should be taken when handling fomites, foodstuffs and even laboratory animals potentially contaminated by faeces containing tapeworm eggs. Various preventive strategies have been proposed to minimize the transmission of infections to the environment (waste disposal, effluent treatment, rodent control), reduce intermediate host populations (insect-proof food-stores using barriers or chemicals) and limit their uptake by definitive hosts (improve food and personal hygiene). Public health education campaigns have proven successful in raising awareness of infections.

Hymenolepis





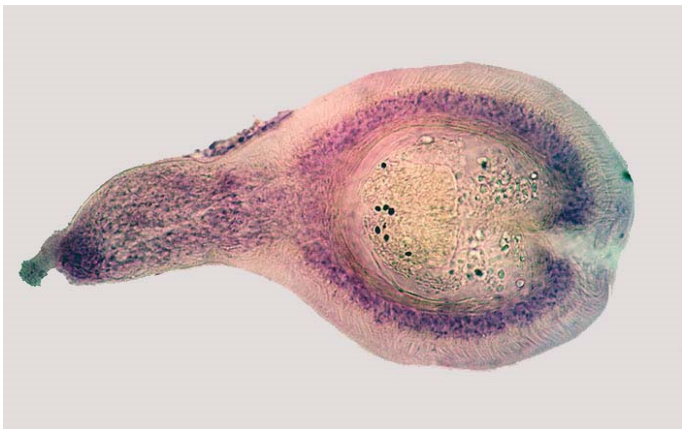
Hymenolepis scolex



Hymenolepis segments



Hymenolepis egg



Hymenolepis cysticercoid