

Index

acanthella 4, 13 hosts 22, 36, 131, 194, 205 host switch 168 acanthocephalan characters see structure metapopulation 174 classification 28-9 niche 145 fossils 12 population changes 140, 141 relationship to other phyla 12 population extinction 162, 163, similarity to other helminth 170, 171, 174, 175 groups 5-6 population over long term 119 proboscis 7 Acanthocephaloides in rays 31 rarity 173 Acanthocephalus acerbus 38 specificity 67, 68, 168 Acanthocephalus aculeatus 38 Acanthocephalus dirus 22, 34, 36 and behaviour of intermediate Acanthocephalus alabamensis 38 Acanthocephalus amuriensis 38 host 91, 97 Acanthocephalus anguillae distribution 38-9 competition 42, 131, 152-5 effects on hosts 83, 85, 96 dispersal 164 seasonal population changes 107 distribution in 42, 197, 198 Acanthocephalus galaxii 36 dominance of community 132 Acanthocephalus geneticus 70 effects on intermediate hosts 85, Acanthocephalus jacksoni 91, 95, 96 effects on intermediate host 96 hosts 12, 13, 22, 36, 82, 131 eggs 17 host switch 206 pathogenic to fish 83 niche 133, 145 Acanthocephalus lucii 7 pollution 184, 185 bioindicator 188 biological tag 183 population over long term 118, 120 competition 153 proboscis 12 dispersal 162 rarity 173 distribution 38, 132 specificity 63 dominance 133, 207 Acanthocephalus clavula effects on intermediate host 85-7, associations 132, 133 91, 95, 96, 110 biological tag 182 host 22, 36, 44, 131, 195 compete 154 intensity and host size 86 distribution 38, 44, 139, 141, 164, life history 20 170 niche 143, 145 effect on host 57 patchy distribution 163 frequency distribution 78 patent period 15



242 Index

Acanthocephalus lucii (cont.) bioaccumulation, see pollution pollution by metal 190 biodiversity 1-8 population decline 171, 197 biogeography 32-42 anthropogenic influences 40, 42 population extinction 163, 174 population seasonality 105 see also colonisation population stability 117-20 British Isles distribution 71-4 continental distributions 32, rarity 172, 173 36-8, 40-2 specificity 63, 168 global distribution 32-8 Acanthocephalus propinquus 70 post-cyclic transfer 25 meso-America 34-5, 37 Acanthocephalus ranae 46 post-glacial patterns 42, 97 post-cyclic transfer 25 recognition of patterns 38 Acanthocephalus rauschi 50 regional 38-42 Acanthocephalus sinensis 47 relict species 37 Acanthocephalus tahlequahensis 38 bioindicators, see pollution biological tags 179-83 Acanthocephalus tumescens 61 flow through food web 62 conditions for use 179-80 post-cyclic transfer 25 of host diet 182-3 of host geographical origin acanthor see eggs accidental hosts 20, 24, 52, 62 179 - 82as escapes from ecosystem of host social structure 180 changes 174, 176 of local host movements 181-3 Bolbosoma sp. 23, 50 Acipenser, as host 31, 44 age:intensity relationships 81, 85, 86 Bolbosoma capitatum 46 as a biological tag 180 Alburnus alburnus, as host 90 Amia, as host 31 Bolbosoma vasculosum Ammodytes tobianus, as host 44 alternative life cycles 26 Anguilla anguilla, as host 7, 13, 36, 43-4, 60, 67, 118, 120, 133-5, Caecidotea intermedius, as host 85, 95, 97 139, 141, 144, 153, 163, 170, Caecidotea militaris, as host 39 171, 173-6, 182, 191, 196-8, Carassius carassius, as host 44 205, 206 Carcinus maenas, as host 109 Anguilla australis, as host 36 Caretta caretta, as host 46 Anguilla dieffenbachii, as host 36 Catostomus commersoni, as host 184 Anguilla reinhardtii, as host 36, 135 Centroryhnchus sp. 23 Anguilla rostrata, as host 36, 171, 187, Centrorhynchus aluconis 21 197, 204 cichlids, as hosts 34 Arhythmorhynchus frassoni 19 Cichlostoma helleri, as host 37 Ariopsis assimilis, as host 184 Cichlostoma synspillum, as host 37, 155 Cichlosoma urophthalmus, as host 35, 37, Armadillidium vulgare, as host 28, 63, 91-3, 96, 100, 169 armadillo, as host 24 co-evolution 10 Arnoglossus laterna, as host 70 colonisation see also dispersal 10, 97, Asellus aquaticus, as host 20, 42, 85-7, 158-74 91, 95, 96, 105, 110, 131, 168, attributes of coloniser 161, 165-6 183, 185, 188, 195, 197, 206, barriers to 166, 167 207 chance factors 166-8 Asellus coxalis, as host 67 compatible landscapes 166 Asellus intermedius, as host 39, 91, 96, host switching 168 106 natural examples 171, 173 Asellus meridianus, as host 67, 68, 131, recipient communities 168-9 164, 168, 194, 205 relation to introductions 165 remote islands 169-70 Barbus barbus, as host 37, 40, 41, 44, 59, Rhine system 171-2 60, 64, 66, 67, 72, 164, 191, specificity implications 54, 59 194, 206, 207 vacant niches 169 communities, 125-55 Barbus tyberinus, as host 66, 73 behaviour, see parasite-influences on acanthocephalans as part only

125

host behaviour



core and satellite 129, 131	cystacanth 4, 14, 18-20
factors determining richness	co-infections 19
127-9	diapause 18
infracommunity, component	infectivity 18
community, defined 125, 126	in paratenic hosts
in eels 132-6, 139, 141, 145	prevalence levels 19
in freshwater hosts 131-7	protection in host 84
isolationist or interactive 126,	resting stage 18, 26
129-31, 133, 146	site in host 76
regional and local richness 133,	survivorship 18–9
134	survivoisinp 18 9
	damaga es els effects on intermediat
replicability 140–1	damage see also effects on intermediate
richness by host group 127–30	hosts
role of acanthocephalans in	detection 83
structuring 130-7	immunity 82
saturation 133, 136, 144, 145	lack of 82-3
spatial similarity 137–41	to hosts 1-4, 9
suitability for study 125–7	to intestine wall 82
competition see also communities	death
between hosts 131	of hosts, see also epizootics;
criteria for recognition of inter-	parasite-induced host
specific 146	mortality 7, 83
ghost of competition past 126,	of parasites 13
144	Diplomystes viedmensis, as host 61
interspecific 10, 42, 125, 126, 135,	Diploptera punctata, as host 97
136, 147-56	Diptychus dybowskii, as host 41
intraspecific 16, 111, 113, 114, 144	dispersal see also colonisation
non-competitive interactions 10,	autogenic and allogenic species
75, 140	160-2
congeners	colonisation hosts 161
frequency of occurrences 32	dispersal stages 158
in turtles 69-70	dissemination in space and time
multiple congeners 31	159
species flocks 131	host mobility 159
conservation 6	patchiness 160, 162-4
co-occurrences 10, 19, 132	stocking 160, 164, 165, 170, 171
Coregonus clupeaformis, as host 60, 63,	distribution 191
65, 115	by habitat 5, 30–1
•	-
Corregionus hoyi, as host 64, 65	by host 5, 30–1
Corynosoma sp. 21, 23, 130	diversity, see biodiversity
Corynosoma constrictum effect on intermediate host	Dolfusientis chandleri
	and organic pollution 184
behaviour 88, 96	ducks, as host 15
population changes 107	Editor CE
Corynosoma magdeleni 119	Echinogammarus pungens, as host 67,
Corynosoma semerme	168, 205
hosts 22, 23, 36	Echinogammarus stammeri,
paratenic hosts 23	as host 66, 73, 84, 156, 168,
population seasonality 109	185
population stability 119, 121	Echinorhynchus bothniensis 71
Corynosoma strumosum 50	Echinorhynchus coregoni 36
population stability 121	Echinorhynchus gadi 180
Cottus gobio, as host 60, 66, 67, 90	hosts 22
crab, as host 15	organic pollution 184, 186
creek chub, as host 25	relict population 46
Ctenopharyngodon idella,	strains 71
as host 44	Echinorhynchus lateralis 36
Cypridopsis vidua, as host 96	and acid pollution 187
Cyprinus carpio, as host 44	Echinorhynchus pungens 85



Echinorhynchus salmonis 10, 11	distinguish from colonisation 158
and acid pollution 187	hedges against 176, 177
and host size 107	metapopulation rescue 174-5
distribution 138	stochastic influences 166
hosts 22, 36	
population regulation 107, 115	Fessisentis friedi 36
post-cyclic transmission 25	Fessisentis nectuorum 14
strains 71 see also	Floridosentis mugilis 34
Metechionorhynchus salmonis	lifespan 14
Echinorhynchus truttae	food web 19, 20, 26, 28, 60
community dominance 132, 133,	flow through 62-0, 170, 102
137, 139	flow through 63-9, 179, 192
competition 154-6	and life cycle 52
damage to host 83	parasite effects on 101, 193
distribution 162, 206	and specificity 55 use of key species 19, 54, 60, 168,
dominance in community 139	
in eels 36	194, 195, 205
introduced by stocking 165	frequency distribution,
life cycle 15	see overdispersion
patchy distribution 163	Fundulus zebrinus, as host 45
patent period 15	
population decline 171	Gadus morhua, as host 45, 184
seasonal cycle 104-5	Galaxias platei, as host 66
superimposed infections 110	galaxids, as hosts 37
ecosystems, effects on 192–9	Gammarus, as host 15, 40, 65, 69, 70, 84
through dominance 197	Gammarus balcanicus, as host 66, 73
through host diet 196	Gammarus bergi, as host 41
through influence on hosts	Gammarus duebeni, as host 40, 41, 66,
competition 198	70, 72, 108, 168, 178, 206
through introduced species 195	Gammarus fossarum, as host 41, 66, 108,
effects on intermediate hosts see also	156, 159, 164
parasite-induced host	Gammarus lacustris, as host 18, 19, 70,
mortality; parasite-influences	88, 89, 91, 96
on host behaviour	Gammarus locusta, as host 41, 66, 71
on host growth 84	Gammarus pseudolimnaeus, as host 41
on host respiration 84	Gammarus pulex, as host 41, 60, 62, 66,
on host reproduction and	
	70, 72, 78, 84, 90-2, 95-9,
fecundity 84, 85, 96	104, 106, 108, 111, 116, 117,
egg 4, 13 infection of intermediate host	159, 162, 163, 165, 168, 171,
13-4, 17-8	183, 185, 189, 194, 197–9, 206
*	Gammarus roeseli, as host 66, 73, 97, 98, 198
release from adult 13, 16	
resistant (resting) stage 17, 26	Gammarus salinus, as host 71
survival 16-7	Gammarus tigrinus, as host 41, 69, 171,
time dependence 16	197, 205
epizootics, see damage	Gammarus zaddachi,
Eponephelus morio, as host 140	as host 41, 66, 71
Erimyzon sucetta, as host 41	Gasterosteus aculeatus, as host 27, 151
evolution	Globicephala melas, as host 130, 180
of behaviour 88	Gobius niger, as host 70
rates 177	Gorgorhynchus bullocki
in regions 40	and organic pollution 184
of specificity 53, 55	Gymnocypris przewalskii, as host 44
of strains 40–1, 71–3	
extinction of populations 1, 2, 74,	Hexaglandula corynosoma 19
102, 124	Hippoglossus stenolepis, as host 46
anthropogenic influences on 163,	hooks
175-6	arrangement 5, 82
dangers of 174	variation 13



host capture 31, <i>see also</i> colonisation; specificity	Lota lota, as host 164 Lutanus carponotatus, as host 41, 181,
Hyalella azteca, as host 18, 19, 41, 61,	182
66, 68, 86-8, 96, 114, 156	
Hyalella patagonica, as host 41, 182	Macracanthorhynchus catulinus 23, 25
	Macracanthorhynchus hirudinaceous 10
Ictalurus punctatus, as host 41	bioindicator of metals 191
immune response 82, 111, 149	egg survival 16, 17
indicators see also pollution	life history 15, 23
of ecosystem changes 10, 179	lifespan 14
intermediate hosts see also effects on	in man 50
intermediate host behaviour;	population stability 117, 124
parasite-influences on host	specificity 22, 53, 63
behaviour	Macracanthorhynchus ingens
canalise transmission 20	hosts 22, 48, 50, 52
identity 19-20	paratenic hosts 23
in life cycle 4	Macrophthalmus hirtipes, as host 80, 91,
mixed species infections in 19, 20,	96
156	mating 13, 78-79, 144, 150
prevalence levels in 19	Mediorhynchus centurorum 10
as source communities 19–20	hosts 22
specificity to 61-3	life history 15
use of key species 19, 54, 60, 194,	specificity 63, 68, 69
195	Mediorhynchus grandis 22
introductions, see colonisation	Mediorhynchus papillosus 22
	Melanerpes carolinus 68
Lepomis cyanellus 60, 107, 114	Metechionorhynchus salmonis 11
Lepomis gibbosus, as host 61	baicalensis, endemism 37
Lepomis macrochirus 61	biological tag 183
Leptorhynchoides thecatus	distribution 160
eggs 17, 18	flow through food web 61, 65
compete 114	specificity 60, 63 see also
cystacanth 18, 19	Echinorhynchus salmonis
effect on hosts 86, 87, 114-5, 123,	Metechinorhynchus truttae 156, 164
156	Micropogonias undulatus 184
hosts 22, 36	Micropterus salmoides, as host 41, 61, 68,
paratenic hosts 21	115
specificity 60, 68	Misugurnis fossilis, as host 38
Leuciscus cephalus, as host 7, 12, 40-2,	models, 23
59, 60, 64-7, 73, 82, 90, 91,	community dynamics 125, 146
108, 152, 163, 171, 184, 188,	negative binomial 77, 85, 86
194, 199, 206	null models 126, 154
Leuciscus leuciscus, as host 60, 65, 67, 90,	population dynamics 121–4
106, 116, 117, 187	population regulation and
life cycle	stability 123
basic pattern 7, 9, 52, 168	and R_o 122
fecundity 16	molecular investigations
flexibility 21, 26, 204	diversity 7, 12
models of 4	strains 69, 71-3
numbers known 10	Moniliformis clarki 22, 53
r and K selection 16, 168	Moniliformis dubius 11
rigidity of 2-4, 14, 26	competition 148, 153
variation with habitat 26-7	egg survival 15–7
lifespan	fecundity 16
of adults 14–16	immunity to 82 see also
limitations on data 10–11	Moniliformis moniliformis
Lirceus lineatus, as host 96	Moniliformis moniliformis 10, 11
Longicollum alemniscus 38	bioindicator 191
Longicollum pagrostomi 38	competition 149–50



Moniliformic moniliformic (cont)	life greles 26-7
Moniliformis moniliformis (cont.)	life cycles 26–7
effect on intermediate host	patchy distribution 163, 170
behaviour 93, 94, 96	population changes 141, 170
hosts 22, 50	post-cyclic transmission 25
niche 76	rarity 172, 173
pollution, metal 191	Neoechinorhynchus saginatus 81, 107
± '	
post-cyclic transmission 25	nestedness 9, 125
regulation in host 123	in community structure 136, 140
specificity 53, 63, 78	Noemacheilus barbatulus, as host 60, 67
strains 177	number of species 4, 29
survival in intermediate host 84	nutrient uptake 13
see also Moniliformis dubius	Nycticorax nycticorax, as host 169
	Tryevicorum nyevicorum, ao 11000 100
Monoporeia affinis, as host 120, 121	
see also Pontoporeia affinis	Octospinifer chandleri
2 00	as coloniser 169
	effect on intermediate host 96
niche	effect on intermediate flost 96
assists mating 78	hosts 22
competition for 112	post-cyclic transmission 25
description of 141	Octospinifer macilentus
equation with site 142–4	eggs 17
extra-intestinal 18, 76	and host size and intensity 81
fundamental and realised 143	and organic pollution 184
infracommunity and component	Oncorhynchus kisutch, as host 64, 65
community 143	Oncorhynchus mykiss, as host 59, 60,
movement to 154	65-7, 90, 112, 113, 152,
number of 135	164, 168, 170
overlap 143, 153	Onicola pomatostomi
resource utilisation and 141-2,	as coloniser 169, 207
146, 147	Osmerus mordax, as host 64
selective site segregation 144, 147	overdispersion 26, 76–82
shift 146, 148, 149, 151, 152	and competition 146, 147
and site selection 10, 12, 13, 76,	indices 77
126	in intermediate hosts 79, 85
vacant 126, 129, 145, 169, 195	in models 122, 123
night heron, as host 19	spectrum 77-8
Neoechinorhynchus sp. 69	owl, as host 21
	OW1, 83 HOSt 21
Neoechinorhynchus aldrichettae 36	
Neoechinorhynchus carpiodi 82	Pallisentis missouriensis 25
Neoechinorhynchus cristatus	Pallisentis rexus
pollution 184	egg behaviour 18
-	
post-cyclic transmission 25	parasite-induced host mortality see also
specificity 63	parasite-influences on host
Neoechinorhynchus cylindratus 22, 36, 96	behaviour 79, 80, 83
Neoechinorhynchus emydis	and age (size):intensity curves
2	
host 22	79-80
life cycle 27	direct 85–7
Neoechinorhynchus golvani 155	as population regulator 102, 110
in Mexican cichlids 34, 35, 37	by selective predation 85, 87, 89,
Neoechinorhynchus rutili	90, 92
biological tag 181	unproven 87
coloniser 140, 165	parasite-influences on host behaviour
community contribution 133, 141	adaptive nature of 91, 99–100
competition 151	alterations in aquatic
dispersal 164	intermediate host behaviour
distribution 42, 44, 132, 195,	87–93. 98
206	alterations in colour 94-5, 97
egg 17	alterations in terrestrial
hosts 22, 36	intermediate host behaviour
and host size and intensity 81	93, 94



conflict between species 95	Plagiorhynchus cylindraceus
drift 89, 92	as a coloniser 169
effect on ecosystems 194	effect on behaviour of
failure to influence host	intermediate host 91-3
behaviour 97-9	hosts 28, 63
improves transmission success 88,	and host capture 178
91, 94	Platichthys flesus, as host 40, 41, 65-7,
paratenic hosts 84	71, 75, 93, 94, 196
specificity 54	Pleuronectes americanus, as host 186
parasitology as ecology 2-3	Pollachius virens, as host 180
paratenic hosts	pollution indicators
behaviour of 84	acidification 187
bridge trophic levels in	heavy metals 8, 187-92
transmission 23, 28	organic pollution 183-6, 191
bridge water and land in	Polymorphus sp. 19, 20
transmission 23, 26, 28	Polymorphus cetacea 130
confusion with accidental host,	Polymorphus marilis
and extra-intestinal in	and intermediate host behaviour
definitive 20, 21	88, 89
definition 20	diapause 18
diversity of 21–3, 27, 47	Polymorphus minutus
escapes rigidity of basic life cycle	associations in intermediate hosts
23-4	156
interactions in 156	dispersal 159
location in 20	effect on intermediate host
models 124	behaviour 91, 95, 96
site of parasite 76	egg survival 17
specificity 53, 55, 61-3	host mortality 84, 124
variation in use of 21–2	hosts 22
Paratenuisentis ambiguus 22, 36	life history 15
bioindicator 188, 189	lifespan 14
coloniser 171, 197, 198, 204	overdispersion 78, 79
pollution by metals 189, 191	patent period 14
Parcoblatta pennsylvanica,	pathogenicity 83, 124
as host 68	population regulation 111-2
Patagonina hatcheri, as host 41, 66	specificity 63
patency 14-6, 26	strains 69, 70
pathogenicity, see damage	Polymorphus paradoxus
patterns 9	effects on intermediate host
in community structure 127	behaviour 88, 89, 91, 96
in global distribution 32, 36-7	Pomphorhynchus bulbocolli
in host usage 50-1	acid pollution 187
in regional distribution 38-42	biological tag 180, 182
in species occurrence 138, 140	community 138
Perca flavescens, as host 138	competition 150-1, 156
Perca fluviatilis, as host 7, 91, 105, 162,	eggs 17, 18
175, 188, 190, 207	hosts 22, 36, 41
Percichthys melanops, as host 41	intensity and host size 194
Percichthys trucha, as host 41, 61, 66	intermediate host 19
Periplaneta americana, as host 63, 66,	population seasonality 109
93, 96	specificity 66
Petenia splendida, as host 37	Pomphorhynchus heronensis 41
Phalacrocorax carbo, as host 150	biological tag 181, 182
Phoca hispida, as host 109	distribution 40
Phoxinus phoxinus, as host 90	Pomphorhynchus laevis 10, 178, 198, 199,
Phytopcypria pustularia, as host 96	206
pigs, as host 14	associations in intermediate host
Pimelodes albicans, as host 41	156
Pimelodes maculatus, as host 41	bioindicator 187, 191



Pomphorhynchus laevis (cont.)	models 101, 103, 121–4
biological tag 180-2	non-equilibrium (patch) dynamics
colonisation by 168, 170, 171, 173,	102, 103
196	regulation of host-parasite
competition 42, 113, 131, 152,	systems 102
154, 155	regulation and stability 9, 101-4
damage to host 44	regulatory factors 102
dispersal 162, 164	regulatory mechanisms 110-4
distribution 37, 40–2, 132, 162–4,	seasonal dynamics 104-6, 108,
197	109
dominance of communities 137,	stability, evidence for 102–4
139, 141, 207	stability, evidence for 102 4 stability over long term 116-21
effect on definitive host 82	
	superimposed on host dynamics 2
effect on intermediate host 84,	Porcellio scaber, as host 169
91, 95, 97	post-cyclic transmission 24–6
effect on intermediate host	cannibalism 26
behaviour 85, 90–2, 96, 98, 99	definition 24
frequency distribution 78	occurrence 24–6
food web 194	specificity 62
hosts 22, 36, 41, 64, 66	Procyon lotor, as host 23, 52
host switching 168	Profilicollis antarcticus 91
immune response to 82	Profilicollis botulus
life cycle 7	lifespan 14, 15, 18
metapopulation 145	population dynamics 109, 124
models of 123, 124	Prosthorhynchus formosus
molecular studies 72, 73	egg survival 17
niche 145	
pollution, by metals 187, 188,	Raja, as host 31
191	rarity
pollution, organic 184, 185	changing status 172
population dynamics 106, 108,	of species 1, 172-3
112, 116	regulation, see population dynamics
population stability 117	Reinhardtinus hippoglossoides,
post-cyclic transmission 25	as host 46
proboscis 7, 82	Rhadinorhynchus ganapatii 45
rarity 173	Rutilus rutilus, as host 90
seasonality in populations 108	Rumus rumus, as nost 50
site in host 12, 75	salamanders, as host 14
	Salmo gairdneri, as host 14
specificity 59–62, 68, 168, 174	•
strains of 66, 71-4	Salmo salar, as host 60, 180, 181
Pomphorhynchus lucyi 41	Salmo trutta, as host 27, 36, 40, 41, 44,
molecular distinction 72, 73	45, 59, 60, 65–7, 72, 104, 108,
Pomphorhynchus patagonicus	154, 155, 164, 165, 170, 178,
biological tag 182	194, 206
endemism 37, 40	Salvelinus alpinus, as host 34, 45
hosts 41	Salvelinus fontinalis, as host 187
specificity 66, 168	scales 9
Pomphorhynchus perforator 41	Schizothorax pseudooxainsis, as host 41
Pomphorhynchus rocci 41	seal, as host 130
Pomphorhynchus sebastichthydis 41	seasonal cycles, see population
Pomphorhynchus sphaericus	dynamics
Pomphorhynchus yamagutii 40, 41	Sebastes nebulosus, as host 45
Pontoporeia affinis, as host 19, 38, 39,	Sebastichthys oblongatus, as host 41
60, 61, 64, 160, 183, 194	Sialis lutaria, as host 27
see also Monoporeia affinis	site in host see also niche
Pontoporeia blainvillii, as host 130	alimentary tract preferences
Population dynamics see also	75-6, 125
regulatory mechanisms 4,	competition 75
101-20	crowding 75



differences between host strains	strains 27
75	and distribution 75
in intermediate host 76	founder effects 166
site segregation see niche	influence of host and isolation 40,
snake, as host 23	70
Somataria mollisima, as host 15, 83, 109	influence on population
Sorex, as host 21	dynamics 108
Southwellina hispida	specificity 69-74
coloniser 169	structure 6
competition 150	proboscis, see hooks
species richness	reproductive systems 13
in aquatic mammals 46	uniformity of 3, 4
in birds 47-8	success
continental differences 32-8	criteria 5, 8, 10
in freshwater fish hosts 36, 44	systematics, see also strains
in herptiles 46-7	classes 29
host and habitat 43-51	problems with 4
host diet as major influence 50-1	species distribution by class and
importance of intermediate host	genus 29, 30
availability 45	species distribution by habitat 30,
in man 49-50	31
in marine fish hosts 44-6	species distribution by host 30-1,
in terrestrial mammals 49	41
tropics versus temperate regions	texts 4
33-5	
in turtle hosts 46	Tanaorhamphus ambiguus 36
specificity 9, 52–72	Telosentis australiensis 36, 172
aid to colonisation 166, 168	Telosentis exiguus 36
changes with locality 63-9	Tenuiproboscis misugurni 38
criteria 56-8	Thymallus thymallus, as host 59, 60, 90,
definition 52	164, 194
different types of host 53-5	Trachemys scripta, as host 69
ecological versus phylogenetic 74	transmission
evolution of specialisation 52–3,	egg to arthropod 17-8
64	by paratenic hosts 20–4
and food web 52, 62	trophic levels, see also food web
indices of 58-9	bridged by paratenic hosts 23
to intermediate and paratenic	bridged by post-cyclic
hosts 61-3	transmission 26, 55
relation to probability of	encounter filters 55
extinction 176	life cycle progress through 52
reproductive status in host 59–61,	me eyere progress through 52
67	Uca rapax, as host 19
sampling effort 56-8	
screens (filters) to infection 54-6	water rail, as host 19
strain 69-74	whale, as host 23
stocking, see colonisation	woodroach, as host 23