The following supplement accompanies the article

Influence of parasitism on bioturbation: from host to ecosystem functioning

Annabelle Dairain*, Alexia Legeay, Xavier de Montaudouin

*Corresponding author: annabelle.dairain@u-bordeaux.fr

Marine Ecology Progress Series 619: 201–214 (2019)

Supplement

Table S1 List of bioturbating species occurring in coastal environments. For each species, one reference evaluating the role of the species as a bioturbator is given.

Species	Class	Family	Bioturbation parameters estimated	References
ANNELIDA				
***Thalassodrilides* sp.**	Clitellata	Naididae	Influence on sediments geochemistry	(Ito et al. 2016)
Melinna cristata	Polychaeta	Ampharetidae	Influence on sediments structure, observations of sediment reworking	(Persson & Rosenberg 2003)
Melinna palmata	Polychaeta	Ampharetidae	Quantification of bioirrigation and sediment reworking	(Massé 2014)
Abarenicola affinis	Polychaeta	Arenicolidae	Influence on sediment topography	(Goerlitz et al. 2015)
Abarenicola pacifica	Polychaeta	Arenicolidae	Quantification of sediment reworking	(Swinbanks 1981)
Arenicola marina	Polychaeta	Arenicolidae	Quantification of bioirrigation	(Delefosse et al. 2015)
Maxmuelleria lankesteri	Polychaeta	Bonelliidae	Quantification of sediment reworking	(Hughes et al. 1996)
Capitella* cf. *teleta	Polychaeta	Capitellidae	Influence on sediments geochemistry	(Ito et al. 2016)
Heteromastus filiformis	Polychaeta	Capitellidae	Quantification of sediment reworking, influence on nutrients cycling	(Quintana et al. 2007)
Heteromastus similis	Polychaeta	Capitellidae	Influence on nutrients cycling	(Figueiredo-Barros et al. 2009)
Notomastus latericeus	Polychaeta	Capitellidae	Quantification of sediment reworking	(Giangrande et al. 2001)
***Notomastus* sp.**	Polychaeta	Capitellidae	Influence on nutrients cycling	(Kikuchi 1987)
Cirratulus grandis	Polychaeta	Cirratulidae	Observation of sediment transport, quantification of bioturbation rates	(Shull & Yasuda 2001)
Cirriformia filigera	Polychaeta	Cirratulidae	Influence on nutrients cycling	(Banks et al. 2013)
Timarete (Cirriformia) luxuriosa	Polychaeta	Cirratulidae	Influence on sediments geochemistry (penetration of oxygen in the sediment)	(Zorn et al. 2006)
Glycera alba	Polychaeta	Glyceridae	Influence on nutrients cycling and sediment geochemistry	(Norling et al. 2007)
Lumbrineris latreilli	Polychaeta	Lumbrineridae	Influence on nutrients cycling	(Casado-Coy et al. 2017)

Axiothella rubrocincta	Polychaeta	Maldanidae	Quantification of sediment reworking	(Kudenov 1982)
***Clymenella* sp.**	Polychaeta	Maldanidae	Influence on sediments geochemistry (penetration of oxygen in the sediment)	(Zorn et al. 2006)
Clymenella torquata	Polychaeta	Maldanidae	Quantification of sediments reworking	(Campbell & Lindsay 2014)
Maldane sarsi	Polychaeta	Maldanidae	Influence on sediments geochemistry	(Dufour et al. 2008)
Nephtys caeca	Polychaeta	Nephtyidae	Quantification of sediment reworking	(Piot et al. 2008)
Nephtys hombergii	Polychaeta	Nephtyidae	Quantification of bioirrigation and sediment reworking	(Murray et al. 2014)
Nephtys incisa	Polychaeta	Nephtyidae	Influence on sediments structure	(Michaud et al. 2010)
Alitta virens	Polychaeta	Nereididae	Quantification of bioirrigation and sediment reworking	(Murray et al. 2014)
Hediste (Neanthes) japonica	Polychaeta	Nereididae	Influence on nutrients cycling	(Kikuchi 1987)
Hediste (Nereis) diversicolor	Polychaeta	Nereididae	Quantification of bioirrigation and sediment reworking	(Murray et al. 2014)
Laeonereis culveri (acuta)	Polychaeta	Nereididae	Influence on sediments structure	(Palomo & Iribarne 2000)
Perinereis aibuhitensis	Polychaeta	Nereididae	Quantification of sediment reworking	(Koo & Seo 2017)
Perinereis nuntia	Polychaeta	Nereididae	Influence on sediments geochemistry	(Ito et al. 2016)
Diopatra cuprea	Polychaeta	Onuphidae	Influence on sediments geochemistry	(Mayer et al. 1995)
Kinbergonuphis (Onuphis) jenneri	Polychaeta	Onuphidae	Quantification of bioirrigation, influence on nutrients cycling	(Waldbusser & Marinelli 2009)
Naineris laevigata	Polychaeta	Orbiniidae	Quantification of sediment reworking	(Giangrande et al. 2001)
Scoloplos armiger	Polychaeta	Orbiniidae	Quantification of bioirrigation, influence on sediments geochemistry	(Valdemarsen et al. 2018)
Owenia fusiformis	Polychaeta	Oweniidae	Influence on sediments structure	(Noffke et al. 2009)
Lipobranchius jeffreysii	Polychaeta	Scalibregmatidae	Quantification of sediment reworking	(Lindqvist et al. 2016)
Scalibregma inflatum	Polychaeta	Scalibregmatidae	Quantification of sediment reworking	(Caradec et al. 2004)
Marenzelleria arctia	Polychaeta	Spionidae	Influence on nutrients cycling, quantification of bioirrigation	(Renz & Forster 2014)
Marenzelleria neglecta	Polychaeta	Spionidae	Influence on nutrients cycling, evidence of sediments transport	(Norling et al. 2007)
Marenzelleria viridis	Polychaeta	Spionidae	Influence on nutrients cycling, quantification of sediment reworking	(Quintana et al. 2007)
Polydora ciliata	Polychaeta	Spionidae	Influence on nutrients cycling	(Bartoli et al. 2009)
Pygospio elegans	Polychaeta	Spionidae	Influence on sediments composition	(Bolam & Fernandes 2003)
Eupolymnia heterobranchia	Polychaeta	Terebellidae	Influence on nutrients cycling	(Marinelli 1992)
Eupolymnia nebulosa	Polychaeta	Terebellidae	Observation of sediments transport	(Maire et al. 2007)
Lanice conchilega	Polychaeta	Terebellidae	Influence on nutrients cycling, quantification of sediment reworking	(Braeckman et al. 2010)
Pectinaria gouldii	Polychaeta	Terebellidae	Influence on sediments resuspension	(Davis 1993)
Urechis caupo	Polychaeta	Urechidae	Quantification of burrow irrigation	(Osovitz & Julian 2002)

ARTHROPODA				
Alpheus macellarius	Malacostraca	Alpheoidea	Influence on sediments geochemistry and nutrients cycling	(Holmer & Heilskov 2008)
Calocaris templemani	Malacostraca	Axiidae	Quantification of burrow irrigation and sediment reworking	(Gagnon et al. 2013)
Corallianassa longiventris	Malacostraca	Axiidae	Influence on sediments geochemistry	(Abed-Navandi et al. 2005)
Biffarius (Callianassa) filholi	Malacostraca	Callianassidae	Quantification of sediment reworking	(Berkenbusch & Rowden 1999)
Biffarius arenosus	Malacostraca	Callianassidae	Influence on sediments geochemistry	(Bird et al. 2000)
Callianassa subterranea	Malacostraca	Callianassidae	Quantification of sediment reworking	(Rowden et al. 1998)
Callichirus (Callianassa) kraussi	Malacostraca	Callianassidae	Quantification of sediment reworking	(Branch & Pringle 1987)
Callichirus islagrande	Malacostraca	Callianassidae	Quantification of burrow irrigation	(Stanzel & Finelli 2004)
Eucalliax panglaoensis	Malacostraca	Callianassidae	Defined as bioturbators, influence on sediment structure	(Dworschak 2006, Kneer et al. 2013)
Glypturus (Callichirus) armatus	Malacostraca	Callianassidae	Quantification of sediment reworking, influence on sediments structure	(de Vaugelas et al. 1986)
Glypturus (Callichirus) laurae	Malacostraca	Callianassidae	Quantification of sediment reworking	(de Vaugelas & de Saint Laurent 1984)
Lepidophthalmus bocourti	Malacostraca	Callianassidae	Quantification of sediment reworking	(Nates & Felder 1998)
Lepidophthalmus louisianensis	Malacostraca	Callianassidae	Influence of bioturbation activity on contaminants' fate, quantification of sediment reworking	(Klerks et al. 2007)
Lepidophthalmus sinuensis	Malacostraca	Callianassidae	Quantification of sediment reworking, influence on sediments geochemistry	(Nates & Felder 1998)
Neotrypaea californiensis	Malacostraca	Callianassidae	Influence on sediments bioirrigation	(Volkenborn, Polerecky, et al. 2012)
Pestarella (Callianassa) tyrrhena	Malacostraca	Callianassidae	Influence on sediments geochemistry	(Papaspyrou et al. 2005)
Pestarella tyrrhena	Malacostraca	Callianassidae	Influence on nutrients cycling, observation of sediment reworking	(Papaspyrou et al. 2004)
Sergio trilobata	Malacostraca	Callianassidae	Influence of bioturbation activity on contaminants' fate, quantification of sediment reworking	(Klerks et al. 2007)
Trypaea australiensis	Malacostraca	Callianassidae	Influence on nutrients cycling, quantification of bioirrigation	(Webb & Eyre 2004a)
Corophium arenarium	Malacostraca	Corophiidae	Influence on sediments structure	(Jones & Jago 1993)
Corophium volutator	Malacostraca	Corophiidae	Influence on nutrients cycling, quantification of bioirrigation	(Mermillod-Blondin et al. 2005)
Leptocheirus plumulosus	Malacostraca	Corophiidae	Influence on sediments geochemistry	(Chandler et al. 2014)
Dotilla fenestrata	Malacostraca	Dotillidae	Influence on sediments geochemistry, quantification of sediment reworking	(Bulcao & Hodgson 2012)
Victoriopisa australiensis	Malacostraca	Eriopisidae	Influence on nutrients cycling	(Dunn et al. 2009)
Heloecius cordiformis	Malacostraca	Helociidae	Influence on sediments structure, quantification of sediment reworking	(Katrak & Bird 2003)
Laomedia astacina	Malacostraca	Laomediidae	Influence on nutrients cycling	(Kang et al. 2018)
Hemiplax hirtipes	Malacostraca	Macrophthalmidae	Quantification of sediment reworking	(Rowden 2016)

Macrophthalmus japonicus	Malacostraca	Macrophthalmidae	Influence on sediments structure and geochemistry	(Tanaka et al. 2017)
Mictyris longicarpus	Malacostraca	Mictyridae	Influence on nutrients cycling and sediments structure, quantification of bioirrigation	(Webb & Eyre 2004b)
Sarsamphiascus (Amphiascus) tenuiremis	Malacostraca	Miraciidae	Influence on sediments geochemistry	(Chandler et al. 2014)
Austruca (Uca) annulipes	Malacostraca	Ocypodidae	Quantification of sediment reworking	(Ólafsson & Ndaro 1997)
Austruca (Uca) triangularis	Malacostraca	Ocypodidae	Influence on sediments geochemistry	(Mokhtari et al. 2016)
Cranuca (Uca) inversa	Malacostraca	Ocypodidae	Quantification of sediment reworking	(Penha-Lopes et al. 2010)
Gelasimus (Uca) vocans	Malacostraca	Ocypodidae	Influence on sediments geochemistry and nutrients cycling	(Kristensen & Alongi 2006)
Leptuca (Uca) crenulata	Malacostraca	Ocypodidae	Influence on sediments geochemistry and microbial community, defined as a bioturbating species	(Bertics & Ziebis 2009)
Leptuca (Uca) cumulanta	Malacostraca	Ocypodidae	Quantification of sediment reworking	(Aschenbroich et al. 2016)
Leptuca (Uca) leptodactyla	Malacostraca	Ocypodidae	Influence on sediments geochemistry and structure	(Natálio et al. 2017)
Leptuca (Uca) panacea	Malacostraca	Ocypodidae	Quantification of sediment reworking	(Franco et al. 2018)
Leptuca (Uca) uruguayensis	Malacostraca	Ocypodidae	Quantification of sediment reworking, influence on sediments geochemistry	(Botto & Iribarne 2000)
Minuca (Uca) longisignalis	Malacostraca	Ocypodidae	Quantification of sediment reworking	(Franco et al. 2018)
Minuca (Uca) pugnax	Malacostraca	Ocypodidae	Influence on sediments structure	(Smith & Green 2015)
Tubuca (Uca) forcipata	Malacostraca	Ocypodidae	Influence on sediments geochemistry	(Mokhtari et al. 2016)
Tubuca (Uca) paradussumieri	Malacostraca	Ocypodidae	Influence on sediments geochemistry	(Mokhtari et al. 2016)
Tubuca (Uca) rosea	Malacostraca	Ocypodidae	Influence on sediments geochemistry	(Mokhtari et al. 2016)
Uca maracoani	Malacostraca	Ocypodidae	Influence on sediments geochemistry	(Araújo et al. 2012)
Ucides cordatus	Malacostraca	Ocypodidae	Quantification of sediment reworking	(Aschenbroich et al. 2016)
Hyas araneus	Malacostraca	Oregoniidae	Quantification of sediment reworking	(Solan et al. 2004)
Monoporeia affinis	Malacostraca	Pontoporeiidae	Influence on nutrients cycling	(Karlson 2007)
Pontoporeia femorata	Malacostraca	Pontoporeiidae	Observation of sediment reworking	(Lopez & Elmgren 1989)
Sesarma reticulatum	Malacostraca	Sesarmidae	Influence on sediments geochemistry	(Wilson et al. 2012)
Sphaeroma quoianum	Malacostraca	Sphaeromatidae	Influence on sediments structure	(Davidson & de Rivera 2010)
Neaxius acanthus	Malacostraca	Strahlaxiidae	Influence on sediments geochemistry and structure	(Vonk et al. 2008)
Austinogebia edulis	Malacostraca	Upogebiidae	Influence on sediments geochemistry and structure	(Das et al. 2017)
Upogebia africana	Malacostraca	Upogebiidae	Influence on sediments geochemistry	(Tibbles et al. 1994)
Upogebia deltaura	Malacostraca	Upogebiidae	Influence on sediments geochemistry	(Howe et al. 2004)
Upogebia major	Malacostraca	Upogebiidae	Influence on sediments geochemistry	(Kinoshita et al. 2008)
Upogebia pugettensis	Malacostraca	Upogebiidae	Influence on sediments geochemistry and nutrients cycling	(D'Andrea & DeWitt 2009)
Upogebia pusilla	Malacostraca	Upogebiidae	Influence on nutrients cycling	(Pascal, Maire, et al. 2016)

Austrohelice crassa	Malacostraca	Varunidae	Influence on sediments structure	(Needham et al. 2013)
Cyrtograpsus angulatus	Malacostraca	Varunidae	Influence on sediments structure	(Martinetto et al. 2011)
Eriocheir sinensis	Malacostraca	Varunidae	Influence on sediments structure	(Rudnick et al. 2005)
Helice formosensis	Malacostraca	Varunidae	Influence on sediments geochemistry	(Mchenga & Tsuchiya 2008)
Helice tientsinensis	Malacostraca	Varunidae	Influence of bioturbation activity on contaminants' fate	(Qin et al. 2010)
Hemigrapsus oregonensis	Malacostraca	Varunidae	Influence on sediments geochemistry (penetration of oxygen in the sediment)	(Zorn et al. 2006)
Neohelice (Chasmagnathus) granulata	Malacostraca	Varunidae	Quantification of sediment reworking, influence on sediments geochemistry	(Botto & Iribarne 2000)
CEPHALOPRHYNCHA				
Halicryptus spinulosus	Priapulida	Priapulidae	Quantification of bioirrigation and sediment reworking	(Powilleit et al. 2012)
ECHINODERMATA				
Brissopsis lyrifera	Echinoidea	Brissidae	Quantification of sediment reworking	(Lindqvist et al. 2016)
Peronella lesueuri	Echinoidea	Laganidae	Influence on nutrients cycling and sediments structure	(Li et al. 2013)
Echinocardium cordatum	Echinoidea	Loveniidae	Quantification of sediment reworking	(Caradec et al. 2004)
Encope emarginata	Echinoidea	Mellitidae	Influence on sediments structure and the structure of the microphytobenthic assemblage	(Brustolin et al. 2016)
Abatus ingens	Echinoidea	Schizasteridae	Quantification of sediment reworking	(Thompson & Riddle 2005)
Brisaster latifrons	Echinoidea	Schizasteridae	Sediment reworking through vertical migration	(Nichols et al. 1989)
Holothuria (Halodeima) atra	Holothuroidea	Holothuriidae	Quantification of sediment reworking	(Uthicke 1999)
Holothuria (Microthele) whitmaei	Holothuroidea	Holothuriidae	Quantification of sediment reworking	(Shiell & Knott 2010)
Holothuria princeps	Holothuroidea	Holothuriidae	Quantification of sediment reworking	(Dahlgren et al. 1999)
Holothuria tubulosa	Holothuroidea	Holothuriidae	Quantification of sediment reworking	(Coulon & Jangoux 1993)
Molpadia oolitica	Holothuroidea	Molpadiidae	Influence on sediments structure	(Rhoads & Young 1971)
Apostichopus (Stichopus) japonicus	Holothuroidea	Stichopodidae	Influence on sediments geochemistry	(Michio et al. 2003)
Australostichopus mollis	Holothuroidea	Stichopodidae	Influence on nutrients cycling	(MacTavish et al. 2012)
Stichopus chloronotus	Holothuroidea	Stichopodidae	Quantification of sediment reworking	(Uthicke 1999)
Stichopus herrmanni	Holothuroidea	Stichopodidae	Influence on sediments structure, quantification of sediment reworking	(Wolfe & Byrne 2017)
Oestergrenia (Labidoplax) digitata	Holothuroidea	Synaptidae	Quantification of sediment reworking	(Queirós et al. 2015)
Amphiura chiajei	Ophiuroidea	Amphiuridea	Influence on sediments geochemistry	(Norling et al. 2007)
Amphiura filiformis	Ophiuroidea	Amphiuridea	Quantification of sediment reworking	(Caradec et al. 2004)
HEMICHORDATA				
Saccoglossus	Enteropneusta	Harrimaniidae	Influence on sediments geochemistry (penetration of	(Zorn et al. 2006)

bromophenolosus			oxygen in the sediment)	
Balanoglossus aurantiaca	Enteropneusta	Ptychoderidae	Influence on sediments geochemistry	(Waldbusser & Marinelli 2009)
***Schizocardium* sp.**	Enteropneusta	Spengelidae	Influence on sediments structure and geochemistry	(Furukawa et al. 2001)
MOLLUSCA				
Cerastoderma edule	Bivalvia	Cardiidae	Influence on sediments geochemistry and nutrients cycling, quantification of bioirrigation and sediment reworking	(Mermillod-Blondin et al. 2005)
Spisula subtruncata	Bivalvia	Mactridae	Influence on sediments geochemistry and nutrients cycling	(Sospedra et al. 2017)
Mya arenaria	Bivalvia	Myidae	Influence on nutrients cycling	(Michaud et al. 2006)
Nuculana (Nuculana) pernula	Bivalvia	Nuculanidae	Quantification of sediment reworking	(Lindqvist et al. 2016)
Nuculana minuta	Bivalvia	Nuculanidae	Influence on nutrients cycling	(Olsgard et al. 2008)
Nucula hanleyi	Bivalvia	Nuculidae	Influence on nutrients cycling, quantification of sediment reworking	(Murray et al. 2017)
Nucula nitidosa	Bivalvia	Nuculidae	Influence on nutrients cycling, quantification of bioirrigation and sediment reworking	(Wrede et al. 2017)
Nucula proxima (annulata)	Bivalvia	Nuculidae	Influence on sediments structure	(Richardson & Young 1980)
Ensis leei (arcuatus var. directus)	Bivalvia	Pharidae	Influence on sediments structure	(Witbaard et al. 2017)
Nuttallia japonica	Bivalvia	Psammobiidae	Influence on sediments geochemistry and structure	(Kanaya 2014)
Abra alba	Bivalvia	Semeliae	Influence on nutrients cycling and sediments structure	(Braeckman et al. 2010)
Abra nitida	Bivalvia	Semeliae	Quantification of sediment reworking	(Caradec et al. 2004)
Abra segmentum (ovata)	Bivalvia	Semeliae	Quantification of sediment reworking	(Trannum 2017)
Scrobicularia plana	Bivalvia	Semeliae	Influence on sediments structure	(Orvain 2005)
Theora lata	Bivalvia	Semeliae	Influence on nutrients cycling	(Yamada & Kayama 1987)
Tagelus plebeius	Bivalvia	Solecurtidae	Influence on sediments geochemistry and structure	(Alvarez et al. 2015)
Fabulina fabula	Bivalvia	Tellinidae	Sediment reworking	(Kamp & Witte 2005)
Limecola (Macoma) balthica	Bivalvia	Tellinidae	Influence on nutrients cycling	(Michaud et al. 2006)
Limecola (Macoma) contabulata	Bivalvia	Tellinidae	Influence on sediments geochemistry and structure	(Kanaya 2014)
Macoma nasuta	Bivalvia	Tellinidae	Quantification of bioirrigation	(Volkenborn, Meile, et al. 2012)
Macomangulus (Angulus) tenuis	Bivalvia	Tellinidae	Quantification of bioirrigation and sediment reworking, influence on nutrients cycling	(Murray et al. 2014)
Macomona (Tellina) deltoidalis	Bivalvia	Tellinidae	Influence of bioturbation activity on contaminants' fate	(Atkinson et al. 2007)
Macomona liliana	Bivalvia	Tellinidae	Quantification of bioirrigation	(Volkenborn, Meile, et al. 2012)
Macoploma (Macoma) tenta	Bivalvia	Tellinidae	Influence on sediments resuspension	(Davis 1993)

Austrovenus stutchburyi	Bivalvia	Veneridae	Influence on sediments structure and nutrients cycling	(Sandwell et al. 2009)
Chamelea gallina	Bivalvia	Veneridae	Quantification of bioirrigation and sediment reworking, influence on nutrients cycling	(Murray et al. 2017)
Cyclina sinensis	Bivalvia	Veneridae	Influence on nutrients cycling and sediments structure	(Nicholaus & Zheng 2014)
Meretrix meretrix	Bivalvia	Veneridae	Influence on sediments geochemistry	(Shen et al. 2016)
Polititapes aureus (Venerupis aurea)	Bivalvia	Veneridae	Quantification of sediment reworking	(François et al. 1999)
Ruditapes decussatus	Bivalvia	Veneridae	Quantification of sediment reworking	(François et al. 1999)
Ruditapes philippinarum	Bivalvia	Veneridae	Influence on sediments structure	(Sgro et al. 2005)
Yoldia hyperborea	Bivalvia	Yoldiidae	Sediment reworking through vertical migration	(Stead & Thompson 2006)
Yoldia limatula	Bivalvia	Yoldiidae	Influence on sediments structure	(Bender & Davis 1984)
Batillaria flectosiphonata	Gastropoda	Batillariidae	Influence on sediments geochemistry	(Kamimura & Tsuchiya 2006)
Batillaria zonalis	Gastropoda	Batillariidae	Influence on sediments geochemistry	(Kamimura & Tsuchiya 2004)
Peringia (Hydrobia) ulvae	Gastropoda	Hydrobiidae	Influence on sediments structure	(Andersen et al. 2002)
Tritia (Cyclope) neritea	Gastropoda	Nassariidae	Influence on sediments geochemistry	(Pischedda et al. 2008)
Tritia (Ilyanassa) obsoleta	Gastropoda	Nassariidae	Influence on nutrients cycling	(Premo & Tyler 2013)
Pirenella (Cerithideopsilla) cingulata	Gastropoda	Potamididae	Influence on sediments geochemistry	(Kamimura & Tsuchiya 2004)
Terebralia palustris	Gastropoda	Potamididae	Quantification of sediment reworking	(Penha-Lopes et al. 2010)
Turritella communis	Gastropoda	Turritellidae	Quantification of bioirrigation and sediment reworking, influence on nutrients cycling	(Murray et al. 2017)
SIPUNCULA				
Sipunculus (Sipunculus) nudus	Sipunculidea	Sipunculidae	Influence on sediments geochemistry and quantification of sediment reworking	(Li et al. 2015)

Table S2 List of macroparasites documented in bioturbating species (identified in Supplement 1). When available, prevalence (percentage of infestation in the population), abundance (mean number of parasite per potential host) and/or intensity of infection (mean number of parasite per infested host) are given. The size of the samples are given as well. Potential impacts on the host are reported.

Bioturbating species	Parasite taxon	Phylum	Class	Form	Prevalence (%)	Abundance (mean or range)	Intensity of infection	N	Impact on host	Location	Reference
ANNELIDA											
Abarenicola affinis	Opecoelid E	Platyhelminthes	Trematoda	Metacercariae	46.8					New Zealand	(Peoples et al. 2012)
Abarenicola pacifica											
Alitta virens	*Zoogonus rubellus*	Platyhelminthes	Trematoda	Metacercariae	50.6				Reduced survival and foraging activity	United States	(McCurdy & Moran 2004)
Arenicola marina											
Axiothella rubrocincta											
Capitella cf. teleta											
***Capitella* spp.**											
Cirratulus grandis											
Cirriformia filigera											
***Clymenella* sp.**											
Clymenella torquata											
Diopatra cuprea	*Arabella* sp.	Annelida	Polychaeta							United States	(Allen 1952)
Eupolymnia heterobranchia											
Eupolymnia nebulosa											
Glycera alba											
Hediste (Neanthes) japonica											
Hediste (Nereis) diversicolor	*Dichelyne minutus*	Nematoda	Chromadorea		5	0.06	1.2	230		Russia	(Pronkina et al. 2017)
	Dichelyne minutus	Nematoda	Chromadorea							Denmark	(Køie 2001)
	Parvatrema minutum (Gymnophallus nereicola)	Platyhelminthes	Trematoda	Metacercariae						France	(Bartoli 1981)
Heteromastus filiformis	Opecoelid E	Platyhelminthes	Trematoda	Metacercariae	61.2	range = 0 to 15		71	May compromise the structural integrity of the	New Zealand	(Peoples et al. 2012)

						host		
Heteromastus similis								
Kinbergonuphis (Onuphis) jenneri								
Laeonereis culveri (acuta)								
Lanice conchilega								
Lipobranchius jeffreysii								
Lumbrineris latreilli								
Maldane sarsi								
Marenzelleria arctia								
Marenzelleria neglecta								
Marenzelleria viridis	*Himasthla quissetensis*	Platyhelminthes	Trematoda	Metacercariae	Overall: 76.8	33 and 125 (2 sampling times)	United States	(Phelan et al. 2016)
	Lepocreadium setiferoides	Platyhelminthes	Trematoda	Metacercariae				
	Zoogonus lasius	Platyhelminthes	Trematoda	Metacercariae				
Maxmuelleria lankesteri								
Melinna cristata	*Melinnacheres ergasiloides*	Arthropoda	Hexanauplia				Sweden	(Bresciani & Lützen 1974)
Melinna palmata								
Naineris laevigata								
Nephtys caeca								
Nephtys hombergii								
Nephtys incisa								
Notomastus latericeus								
***Notomastus* sp.**								
Owenia fusiformis								
Pectinaria gouldii								
Perinereis aibuhitensis								
Perinereis nuntia								
Polydora ciliata								
Pygospio elegans	*Lepocreadium setiferoides*	Platyhelminthes	Trematoda	Metacercariae			United States	(McCurdy 2001)

Scalibregma inflatum										
Scoloplos armiger										
***Thalassodrilides* sp.**										
Timarete (Cirriformia) luxuriosa										
Urechis caupo										
ARTHROPODA										
Alpheus macellarius[1]										
Austinogebia edulis										
Austrohelice crassa[1]	*Microphallus* sp.	Platyhelminthes	Trematoda	Metacercariae	90.0	26 ± 5.8	50		New Zealand	(Koehler & Poulin 2010)
	Ascarophis sp.	Nematoda	Chromadorea		64.0	3.6 ± 1.0				
	Portunion sp.	Arthropoda	Malacostraca		2.0					
Austruca (Uca) annulipes										
Austruca (Uca) triangularis										
Biffarius arenosus										
Biffarius (Callianassa) filholi										
Callianassa subterranea	*Ione thoracica*	Arthropoda	Malacostraca						Ireland	(Astall et al. 1996)
	Pseudione callianassae	Arthropoda	Malacostraca						United Kingdom	
	Pseudione borealis	Arthropoda	Malacostraca						France	
Callichirus (Callianassa) kraussi										
Callichirus islagrande										
Calocaris templemani										
Corallianassa longiventris										
Corophium arenarium	*Microphallus claviformis*	Platyhelminthes	Trematoda	Metacercariae				Increase of mortality	Denmark	(Jensen et al. 1998)
Corophium volutator	*Microphallus claviformis*	Platyhelminthes	Trematoda	Metacercariae				Increase of mortality		
	Maritrema subdolum	Platyhelminthes	Trematoda	Metacercariae	6.5 to 48		100 per sample and site (16 samples, 2 sites)		Germany	(Meißner & Bick 1997)
	Levinseniella brachysoma	Platyhelminthes	Trematoda	Metacercariae	0.5 to 28					
	Microphallus claviformis	Platyhelminthes	Trematoda	Metacercariae	75 to 100	1.92 ± 0.38 to 15.8 ± 2.32	76 and 102 (2 sampling)	Could contribute to *C. volutator* emergence at the sediment surface	Denmark	(Damsgaard et al. 2005)
	Maritrema subdolum +	Platyhelminthes	Trematoda	Metacercariae	41 to 96	0.5 ± 0.11 to 3.19 ± 0.33				

	Microphallidae sp. no. 15									
	Levinseniella sp.	Platyhelminthes	Trematoda	Metacercariae	11 to 67	0.19 ± 0.10 to 1.44 ± 0.20				
	Gynaecotyla adunca	Platyhelminthes	Trematoda	Metacercariae					Canada	(Shim et al. 2013)
	Skrjabinoclava morrisoni	Nematoda	Chromadorea		0 to 12.5		24 to 484 (23 sampling times)	Increase the emergence of *C. volutator* at the sediment surface	Canada	(McCurdy 1999)
Cranuca (Uca) inversa										
Cyrtograpsus angulatus	*Neocancrincola platensis*	Arthropoda	Hexanauplia		8		65		Argentina	(Alda et al. 2011)
	Ascarophis spp.	Nematoda	Chromadorea		8					
	Acuariinae gen. sp.	Nematoda	Chromadorea		6					
	Profilicollis chasmagnathi	Acanthocephala	Palaeacanthocephala		20					
	undefined Cestoda, order Cyclophyllidea	Platyhelminthes	Cestoda		8					
	Maritrema bonaerense	Platyhelminthes	Trematoda	Metacercariae	94					
	Maritrema cf. *orensense*	Platyhelminthes	Trematoda	Metacercariae	70					
	Levinseniella cruzi	Platyhelminthes	Trematoda	Metacercariae	14					
	Odhneria sp.	Arthropoda	Malacostraca		59					
	Microphallus szidati	Platyhelminthes	Trematoda	Metacercariae	87 to 97		21 to 37 (3 sites)		Argentina	(Mendez Casariego et al. 2015)
	Maritrema bonaerense	Platyhelminthes	Trematoda	Metacercariae	32 to 53					
	Profilicollis chasmagnathi	Acanthocephala	Palaeacanthocephala		60 to 68					
Dotilla fenestrata										
Eriocheir sinensis[1]	*Polyascus gregaria*	Arthropoda	Hexanauplia		10.3 to 55.1		89 to 439 (5 sampling times)	Castration, anecdysis and increase of mortality	China	(Li et al. 2011)
Eucalliax panglaoensis										
Gelasimus (Uca) vocans										
Glypturus (Callichirus) armatus										
Glypturus (Callichirus) laurae										
Helice formosensis[1]										
Helice tientsinensis[1]										
Heloecius cordiformis										
Hemigrapsus oregonensis	*Ascarophis* spp.	Nematoda	Chromadorea		1.8 to 75	1 to 8	4 to 150 (monthly		Canada	(Poinar & Kuris 1975)

							samples over one year)			
	Portunion conformis	Arthropoda	Malacostraca	20.7 to 91.3	range= 0 to more than 5		34 to 97 per sampling site (22 sites)	Female castration	Canada	(Kuris et al. 1980)
	Carcinonemertes epialti	Nemerta	Enopla	0 to 83	0 to 6				United States	(Shields 1993)
	Profilicollis botulus	Acanthocephala	Palaeacanthoc ephala	9 to 62	1.3 to 2.4 (intensity)		42 and 692 (2 sampling times)		Canada	(Ching 1989)
Hemiplax hirtipes										
Hyas araneus										
Laomedia astacina										
Lepidophthalmus bocourti										
Lepidophthalmus louisianensis										
Lepidophthalmus sinuensis										
Leptocheirus plumulosus										
Leptuca (Uca) crenulata										
Leptuca (Uca) cumulanta										
Leptuca (Uca) leptodactyla										
Leptuca (Uca) panacea										
Leptuca (Uca) uruguayensis										
Macrophthalmus japonicus										
Mictyris longicarpus										
Minuca (Uca) longisignalis										
Minuca (Uca) pugnax										
Monoporeia affinis	*Echinorhynchus salmonis*	Acanthocephala	Palaeacantho-cephala		0 to 1.4	1 ± 0		33 to 8084 (17 sites)		Sweden, Finland	(Benesh et al. 2015)
Neaxius acanthus										
Neohelice (Chasmagnathus) granulata[1]	*Microphallus szidati*	Platyhelminthes	Trematoda	Metacercariae	90.1		60.8 ± 13.2	81	Increase of glycogen content in the hepatopancreas, sometimes associated with haemocytic	Brazil	(Robaldo et al. 1999)

								infiltration		
	Neocancrincola platensis	Arthropoda	Hexanauplia	21						
	Ascarophis spp.	Nematoda	Chromadorea	3 to 4						
	Profilicollis chasmagnathi	Acanthocephala	Palaeacantho-cephala	47						
	Maritrema bonaerense	Platyhelminthes	Trematoda	100			36		Argentina	(Alda et al. 2011)
	Maritrema cf. *orensensis*	Platyhelminthes	Trematoda	70						
	Levinseniella cruzi	Platyhelminthes	Trematoda	11						
	Odhneria sp.	Arthropoda	Malacostraca	53						
	Acuariinae gen. sp.	Nematoda	Rhabditida	3						
	Profilicolis chasmagnathi	Acanthocephala	Palaeacanthoc ephala	42.4 to 52.8		0.69 to 0.88	142-145 (4 samples)		Argentina	(La Sala et al. 2012)
Neotrypaea californiensis										
Pestarella (Callianassa) tyrrhena										
Pontoporeia femorata										
Sarsamphiascus (Amphiascus) tenuiremis										
Sergio trilobata										
Sesarma reticulatum[1]										
Sphaeroma quoianum										
Trypaea australiensis										
Tubuca (Uca) forcipata										
Tubuca (Uca) paradussumieri										
Tubuca (Uca) rosea										
Uca maracoani										
Ucides cordatus[1]	*Leidya distorta*	Arthropoda	Malacostraca	0.5 to 2.6			40 -196 (3 sites)		Brazil, Venezuela	(Wunderlich et al. 2017)
Upogebia africana	*Progebiophilus kensleyi*	Arthropoda	Malacostraca		1 couple				South Africa	(Markham 2005)
Upogebia deltaura	*Gyge branchialis*	Arthropoda	Malacostraca		1 couple				United Kingdom	(Astall et al. 1996)
Upogebia major										
Upogebia pugettensis	*Orthione griffenis*	Arthropoda	Malacostraca	27-75	1 couple		100 (5 sites)	Weight loss	United States	(Smith et al. 2008, Griffen 2009)
Upogebia pusilla	*Progebiophilus*	Arthropoda	Malacostraca		1 couple				France	

	euxinicus									
	Gyge branchialis	Arthropoda	Malacostraca		6 to 26	1 couple	50 per sampling times and sites (12 sampling times, 10 sites)	Reduced burrowing and ventilation activities associated with lower sediment reworking and bioirrigation rates and lower exchanges of solutes at the sediment-water interface	France	(Pascal, de Montaudouin, et al. 2016, Pascal 2017)
	Gyge branchialis	Arthropoda	Malacostraca		1.3 to 6.6				Italia	(Dworschak 1988)
	Unknown Metacercariae	Platyhelminthes	Trematoda	Metacercariae	5 to 100					
	Arhythmorhynchus sp.	Acanthocephla	Palaeacantho-cephala		0 to 28.4					
	Maritrema sp.	Platyhelminthes	Trematoda	Metacercariae	26.7 to 96.6	0 to > 1000	40-121 per sampling time and site (24 sampling times, 10 sites)		France	(Dairain et al. 2017)
Victoriopisa australiensis										
CEPHALORHYNCHA										
Halicryptus spinulosus										
ECHINODERMATA										
Abatus ingens[1]										
Amphiura chiajei										
Amphiura filiformis										
Apostichopus (Stichopus) japonicas[1]										
Australostichopus mollis										
Brisaster latifrons[1]										
Brissopsis lyrifera										
Echinocardium cordatum[1]										
Encope emarginata[1]	*Dissodactylus crinitichelis*	Arthropoda	Malacostraca		87		213		Brazil	(Martinelli Filho et al. 2014)
Holothuria (Halodeima) atra[1]	*Megadenus atrae*	Mollusca	Gastropoda		0 to 10.0		25 to 90 per sampling		Japan	(Takano et al. 2017)

							site (7 sites)			
Holothuria princeps[1]										
Holothuria tubulosa[1]										
Holothuria (Microthele) whitmaei[1]										
Molpadia oolitica[1]										
Oestergrenia (Labidoplax) digitata										
Peronella lesueuri[1]										
Stichopus chloronotus[1]										
Stichopus herrmanni[1]										
HEMICHORDATA										
Balanoglossus aurantiaca										
Saccoglossus bromophenolosus										
***Schizocardium* sp.**										
MOLLUSCA										
Abra alba	*Prosorhynchoides (Bucephaloides) gracilescens*	Platyhelminthes	Trematoda	Sporocyst				Castration, alterations in lysosomal functions	Scotland	(Johnston et al. 1982)
Abra nitida										
Abra segmentum (ovata)	*Paratimonia gobii*	Platyhelminthes	Trematoda	Sporocyst, Metacercariae	0.5				France	(Maillard 1975)
	Parvatrema (Gymnophallus) rebecqui	Platyhelminthes	Trematoda	Metacercariae					France	(Bartoli 1983)
	Parvatrema minutum (Gymnophallus nereicola)	Platyhelminthes	Trematoda	Sporocyst, Metacercariae	1 to 40 %				France	(Bartoli 1981)
Austrovenus stutchburyi[1]	*Curtuteria australis*	Platyhelminthes	Trematoda	Metacercariae	8.6	0.1	70	Reduced shell growth rate, decrease of soft tissu dry weight and body condition	New Zealand	(O'Connell -Milne et al. 2016)
	Echinostome parasites (*Curtuteria* spp. and *Acanthoparyphium* spp.)	Platyhelminthes	Trematoda	Metacercariae	29.2 to 100	min range = 0 to 2; max range = 1 to 2260	10 for each site (17 sites)		New Zealand	(Studer & Poulin 2013)
	Gymnophallus sp.	Platyhelminthes	Trematoda	Metacercariae	100	46 (range = 23-	15		New	(Leung et

					126)				Zealand	al. 2009)
	Pseudomyicola spinosus	Arthropoda	Hexanauplia		4	1	500		New Zealand	(Leung & Poulin 2007)
	Curtuteria australis	Platyhelminthes	Trematoda	Metacercariae				Reduced ability to burry	New Zealand	(Mouritsen & Poulin 2005)
	Acanthoparyphium sp.	Platyhelminthes	Trematoda	Metacercariae						
	Curtuteria australis	Platyhelminthes	Trematoda	Metacercariae				Reduced ability to burry	New Zealand	(Mouritsen 2004)
	Boccardia acus	Annelida	Polychaeta							
	Curtuteria australis	Platyhelminthes	Trematoda	Metacercariae				Reduced the ability of the cockle's foot to contract	New Zealand	(Mouritsen 2002)
	Curtuteria australis	Platyhelminthes	Trematoda	Metacercariae	73.3 to 402.6 (mean)		72 to 79 (4 sites)		New Zealand	(Poulin et al. 2000)
	Parvatrema (Meiogymnophallus) sp.	Platyhelminthes	Trematoda	Metacercariae	20.1 to 85.3 (mean)					
	Pseudomyicola spinosus	Arthropoda	Hexanauplia		5.1 to 5.6					
	Cercaria pectinata	Platyhelminthes	Trematoda	Sporocyst	0 to 5.4			Castration		
	Curtuteria australis	Platyhelminthes	Trematoda	Metacercariae				Organisms unable to burry	New Zealand	(Thomas et al. 1998)
Batillaria flectosiphonata										
Batillaria zonalis										
Cerastoderma edule[1]	*Mytilicola orientalis*	Arthropoda	Hexanauplia		0 to 13	1.2 ± 0.1	1 to 145 (14 sites)		The Netherlands	(Goedknegt et al. 2017)
	Bucephalus minimus	Platyhelminthes	Trematoda	Sporocyst	5 ± 8		15 per site (28 sites)		Portugal	(Freitas et al. 2014)
	Diphterostomum brusinae	Platyhelminthes	Trematoda	Metacercariae	54 ± 40	4 ± 3				
	Himasthla continua	Platyhelminthes	Trematoda	Metacercariae	32 ± 26	1 ± 2				
	Himasthla elongata	Platyhelminthes	Trematoda	Metacercariae	48 ± 43	6 ± 10				
	Himasthla interrupta	Platyhelminthes	Trematoda	Metacercariae	30 ± 34	3 ± 6				
	Himasthla quissetensis	Platyhelminthes	Trematoda	Metacercariae	32 ± 26	2 ± 2				
	Monorchis parvus	Platyhelminthes	Trematoda	Sporocyst, Metacercariae	0.2 ± 1					
	Parvatrema fossarum	Platyhelminthes	Trematoda	Metacercariae	4 ± 9	1 ± 1				
	Parvatrema minutum	Platyhelminthes	Trematoda	Metacercariae	52 ± 34	172 ± 398				
	Psilostomum brevicolle	Platyhelminthes	Trematoda	Metacercariae	4 ± 7	0.2 ± 1				
	Renicola roscovita	Platyhelminthes	Trematoda	Metacercariae	3 ± 5	1 ± 1				
	Himasthla elongata	Platyhelminthes	Trematoda	Metacercariae	10 to 100	1 ± 0 to 152 ± 70	50 per site (14 sites)		Ireland	(Fermer et al. 2011)
	Himasthla continua	Platyhelminthes	Trematoda	Metacercariae	0 to 100	1 ± 1 to 16 ± 11				
	Himasthla interrupta	Platyhelminthes	Trematoda	Metacercariae	0 to 35	1 ± 0 to 2 ± 1				
	Renicola roscovita	Platyhelminthes	Trematoda	Metacercariae	0 to 30	1 ± 0 to 9 ± 11				

	Psilostomum brevicolle	Platyhelminthes	Trematoda	Metacercariae	0 to 50		1 ± 0 to 6 ± 4			
	Parvatrema minutum	Platyhelminthes	Trematoda	Metacercariae	76 to 100		8 ± 7 to 1080 ± 511			
	Bucephalus minimus (Labratrema minimus)	Platyhelminthes	Trematoda	Sporocyst	0 to 6					
	Gymnophallus choledochus	Platyhelminthes	Trematoda	Sporocyst, Metacercariae	0 to 5					
	Mytilicola intestinalis	Arthropoda	Hexanauplia		10 to 90		1 ± 0 to 5 ± 2			
	Himasthla quissetensis	Platyhelminthes	Trematoda	Metacercariae	0.2	1.4				
	Himasthla interrupta	Platyhelminthes	Trematoda	Metacercariae	0	0.2				
	Curtuteria arguinae	Platyhelminthes	Trematoda	Metacercariae	4.1	23.7		10 to 20 monthly over 2 years	Increase of mortality	Morocco
	Parvatrema minutum	Platyhelminthes	Trematoda	Metacercariae	91.9	537.1				
	Psilostomum brevicolle	Platyhelminthes	Trematoda	Metacercariae	0	0.1				
	Diphterostomum brusinae	Platyhelminthes	Trematoda	Metacercariae	0.2	1.1				(Gam et al. 2009)
	Himasthla quissetensis	Platyhelminthes	Trematoda	Metacercariae	0.7	4.1				
	Himasthla interrupta	Platyhelminthes	Trematoda	Metacercariae	7.0	41				
	Curtuteria arguinae	Platyhelminthes	Trematoda	Metacercariae	0.9	5.1		10 to 20 monthly over 2 years	Increase of mortality	France
	Parvatrema minutum	Platyhelminthes	Trematoda	Metacercariae	90.7	530.5				
	Psilostomum brevicolle	Platyhelminthes	Trematoda	Metacercariae	0.5	3.1				
	Diphterostomum brusinae	Platyhelminthes	Trematoda	Metacercariae	0.2	1				
	Diphterostomum brusinae	Platyhelminthes	Trematoda	Metacercariae		2.7				
	Parvatrema minutum	Platyhelminthes	Trematoda	Metacercariae		41.3 to 88.8		10 per sampling time (2 sampling time)		Spain (Dang et al. 2009)
	Parvatrema fossarum (Meiogymnophallus fossarum)	Platyhelminthes	Trematoda	Metacercariae		21.5 to 139.9				
	Curtuteria arguinae	Platyhelminthes	Trematoda	Metacercariae		1.6 to 35				
	Diphterostomum brusinae	Platyhelminthes	Trematoda	Metacercariae		0 to 9.3				
	Himasthla interrupta	Platyhelminthes	Trematoda	Metacercariae		0 to 0.5				
	Himasthla quissetensis	Platyhelminthes	Trematoda	Metacercariae		0.1 o 2.3		30 per site (6 sites)		Morocco (Gam et al. 2008)
	Parvatrema minutum	Platyhelminthes	Trematoda	Metacercariae		163.4 to 2016				
	Psilostomum brevicolle	Platyhelminthes	Trematoda	Metacercariae		0 to 0.1				
	Gymnophallus choledochus	Platyhelminthes	Trematoda	Sporocyst	0 to 7				Castration	
	Bucephalus minimus	Platyhelminthes	Trematoda	Sporocyst	0 to 7				Castration	

Monorchis parvus	Platyhelminthes	Trematoda	Sporocyst	0 to 3				Castration	
Paravortex cardii	Platyhelminthes	Rhabditophora			3 to 17				
Pinnotheres pisum	Arthropoda	Malacostraca			10 to 70				
Himasthla elongata	Platyhelminthes	Trematoda	Metacercariae	85.7 ± 21.4		20.5 ± 7.2			
Himasthla continua	Platyhelminthes	Trematoda	Metacercariae	72.3 ± 34.7		15.8 ± 25.1			
Himasthla interrupta	Platyhelminthes	Trematoda	Metacercariae	84.2 ± 38.8		43.7 ± 20.8			
Psilostomum brevicolle	Platyhelminthes	Trematoda	Metacercariae	77.6 ± 38.4		5.8 ± 2.8			
Renicola roscovita	Platyhelminthes	Trematoda	Metacercariae	95.7 ± 6.6		51.8 ± 49.9	20 to 54 (4 sites)		Germany	(Thieltges et al. 2006)
Parvatrema minutum	Platyhelminthes	Trematoda	Metacercariae	22.3 ± 28.6		1.7 ± 0.8			
Gymnophallus gibberosus	Platyhelminthes	Trematoda	Metacercariae	64.4 ± 37.8		5.7 ± 5.2			
Gymnophallus choledochus	Platyhelminthes	Trematoda	Sporocyst	5.2 ± 3.9					
Monorchis parvus	Platyhelminthes	Trematoda	Sporocyst	0.5 ± 1.3					
Gymnophallus choledochus	Platyhelminthes	Trematoda	Sporocyst	7.4 to 71			156 and 240 (2 types of cockles)	Castration, surfacing cockles with higher prevalence of parasite, increased mortality in surfacing cockles	Germany	(Thieltges 2006)
Diphterostomum brusinae	Platyhelminthes	Trematoda	Metacercariae	87.7			1516		Portugal	(Russell-Pinto et al. 2006)
Himasthla quissetensis	Platyhelminthes	Trematoda	Metacercariae	78.5						
Himasthla elongata	Platyhelminthes	Trematoda	Metacercariae	26.9						
Himasthla interrupta	Platyhelminthes	Trematoda	Metacercariae	4.2						
Curtuteria sp.	Platyhelminthes	Trematoda	Metacercariae	2.6						
Bucephalus minimus	Platyhelminthes	Trematoda	Sporocyst	2.3						
Gymnophallus choledochus	Platyhelminthes	Trematoda	Sporocyst, Cercariae, Metacercariae	2.2						
Parvatrema minutum	Platyhelminthes	Trematoda	Metacercariae	93.3						
Parvatrema (Meiogymnophallus) fossarum	Platyhelminthes	Trematoda	Metacercariae	83.5						
Monorchis parvus	Platyhelminthes	Trematoda	Sporocyst, Cercariae, Metacercariae	1.0						
Renicola roscovita	Platyhelminthes	Trematoda	Metacercariae	8.4						
Bucephalus minimus	Platyhelminthes	Trematoda	Sporocyst					Could contribute to cockle emergence at the sediment surface	France	(Desclaux et al. 2002)
Himasthla quissetensis	Platyhelminthes	Trematoda	Metacercariae					Could contribute to cockle emergence at the sediment surface		
Paravortex cardii	Platyhelminthes	Rhabditophor		0 to 57			30 per site		Spain	(Carballal

			a				(34 sites)			et al. 2001)
	Ciliates (*Trichodina* sp. + *Rynchodida*-like)				0 to 55					
	Mytilicola-like	Arthropoda	Hexanauplia		0 to 7			Metaplasia of intestinal epithelial cells		
	Gymnophallus choledochus	Platyhelminthes	Trematoda	Sporocyst, Cercariae, Metacercariae	0.2					
	Bucephalus minumus	Platyhelminthes	Trematoda	Sporocyst	2.6					
	Monorchis parvus	Platyhelminthes	Trematoda	Sporocyst, Cercariae, Metacercariae	0.2					
	Himasthla continua	Platyhelminthes	Trematoda	Metacercariae	47.9	0 to 15				
	Himasthla elongata	Platyhelminthes	Trematoda	Metacercariae	0.4					
	Himasthla interrupta	Platyhelminthes	Trematoda	Metacercariae	37.5	0 to 30				
	Parvatrema (Meiogymnophallus) fossarum	Platyhelminthes	Trematoda	Metacercariae	0		453		France	(de Montaudouin et al. 2000)
	Parvatrema (Meiogymnophallus) minutum	Platyhelminthes	Trematoda	Metacercariae	59.4					
	Psilostomum brevicolle	Platyhelminthes	Trematoda	Metacercariae	11.5	0 to 3				
	Renicola roscovita	Platyhelminthes	Trematoda	Metacercariae	18.8	0 to 6				
	Paravortex cardii	Platyhelminthes	Rhabditophora	Metacercariae	30.5	1				
	Mytilicola intestinalis	Arthropoda	Hexanauplia		5.1					
	unindentified cestode	Platyhelminthes	Cestoda		0.4					
	Himasthla elongata	Platyhelminthes	Trematoda	Metacercariae		24 ± 17		220	Reduced ability of cockles to deal with hypoxia	Denmark	(Wegeberg & Jensen 1999)
	Monorchis parvus (Cercaria cerastodermae I)	Platyhelminthes	Trematoda	Sporocyst, Cercariae, Metacercariae	17 to 81 %			147	Castration; reduced muscular tissue in the foot, reduced ability to close the valves	Sweden	(Jonsson & Andé 1992)
	Paravortex karlingi	Platyhelminthes	Rhabditophora							Scotland	(Pike & Burt 1981)
	Malacobdella grossa	Nemerta	Enopla		2 to 96.2	0 to 2		77 to 210 (7 sites)		Scotland	(Jones et al. 1979)
	Himasthla elongata	Platyhelminthes	Trematoda	Metacercariae			8.3 ± 0.9		Modifications of genes expression, induction of oxidative burst, increase of the concentration of circulating haemocytes		(Paul-Pont, Gonzalez, et al. 2010)
Chamelea gallina											

Cyclina sinensis[1]	*Himasthla alincia*	Platyhelminthes	Trematoda	Metacercariae	100	57.8		20		South Korea	(Han et al. 2009)
Ensis leei (arcuatus var. directus)[1]	Undefined Turbellaria	Platyhelminthes			0 to 7.7			135 to 165 (3 sites)		Spain	(Darriba et al. 2010)
	Undefined trematoda, fam. Bucephallidae	Platyhelminthes	Trematoda	Sporocyst, Cercariae	0 to 3.2				Castration		
	Undefined trematoda	Platyhelminthes	Trematoda	Metacercariae	0 to 13.3						
	Cestode-like larvae	Platyhelminthes	Cestoda		0 to 3.7						
Fabulina fabula[1]											
Limecola (Macoma) balthica[1]	*Himasthla elongata*	Platyhelminthes	Trematoda	Metacercariae	7.4 ± 2.1		1.2 ± 0.2	16 to 96 per site (4 sites)		Germany	(Thieltges et al. 2006)
	Himasthla continua	Platyhelminthes	Trematoda	Metacercariae	6.8 ± 8.9		1 ± 0				
	Himsthla interrupta	Platyhelminthes	Trematoda	Metacercariae	2.9 ± 3.3		1 ± 0				
	Psilostomum brevicolle	Platyhelminthes	Trematoda	Metacercariae	4.3 ± 5.2		1 ± 0				
	Renicola roscovita	Platyhelminthes	Trematoda	Metacercariae	2.9 ± 3.3		1 ± 0				
	Gymnophallus gibberosus	Platyhelminthes	Trematoda	Metacercariae	43.9 ± 13.6		3.2 ± 1.2				
	Gymnophalloides (Lacunovermis) macomae	Platyhelminthes	Trematoda	Metacercariae	10.1 ± 6.8		1.2 ± 0.2				
	Parvatrema affine	Platyhelminthes	Trematoda	Sporocyst	3.1 ± 6.3						
	Trematoda, fam. Gymnophallidae	Platyhelminthes	Trematoda	Metacercariae	8 to 56 %			50 to 78 per site (6 sites)	Parasite presence associated with deformation of the hinge plate	Russia	(Gantsevich et al. 2016)
	Mytilicola orientalis	Arthropoda	Hexanauplia		6 to 7 %		1 ± 0	14 to 116 per site (11 sites)		The Netherlands	(Goedknegt et al. 2017)
Limecola (Macoma) contabulata[1]											
Macomangulus (Angulus) tenuis											
Macoma nasuta[1]											
Macomona (Tellina) deltoidalis	*Curtuteria australis*	Platyhelminthes	Trematoda	Metacercariae		Overall: range = 0 to 288, mean = 20.4		196		New Zealand	(Leung & Poulin 2008)
	Acanthoparyphium sp.	Platyhelminthes	Trematoda	Metacercariae							
Macomona liliana[1]											
Macoploma (Macoma) tenta											
Meretrix meretrix[1]	*Conchyliurus bombasticus*	Arthropoda	Hexanauplia							Thailand	(Ho & Kim 1995)
	Ostrincola portonoviensis	Arthropoda	Hexanauplia								
	Lichomolgus similis	Arthropoda	Hexanauplia								
Mya arenaria[1]											
Nucula hanleyi											
Nucula nitidosa											

Nucula proxima (annulata)					
Nuculana (Nuculana) pernula					
Nuculana minuta					
Nuttallia japonica					
Peringia (Hydrobia) ulvae	*Asymphylodora demeli*	Platyhelminthes	Trematoda	Baltic Sea	(Thieltges et al. 2009)
	Cryptogonimidae sp.	Platyhelminthes	Trematoda	North Sea	
	Aphalloides coelomicola (timmi)	Platyhelminthes	Trematoda	Baltic Sea	
	Cercaria sinitzini	Platyhelminthes	Trematoda	Baltic Sea, South European Atlantic Shelf	
	Bunocotyle progenetica	Platyhelminthes	Trematoda	North Sea, Celtic Sea and South European Atlantic Shelf	
	Bunocotyle cingulata	Platyhelminthes	Trematoda	Baltic Sea	
	Haploporidae sp. no. 3	Platyhelminthes	Trematoda	North Sea, Celtic Sea and South European Atlantic Shelf	
	Haploporidae sp. no. 4	Platyhelminthes	Trematoda	North Sea, Celtic Sea and South European Atlantic Shelf	
	Haploporidae sp. no. 6	Platyhelminthes	Trematoda	South European Atlantic Shelf	
	Haploporus benedeni	Platyhelminthes	Trematoda	South European Atlantic Shelf	
	Haploporidae sp. no. 7	Platyhelminthes	Trematoda	North Sea, Celtic Sea and South European Atlantic Shelf	
	Deropristis inflata	Platyhelminthes	Trematoda	North Sea	
	Himasthla continua	Platyhelminthes	Trematoda	Baltic Sea, North Sea,	

			Celtic Sea
Himasthla interrupta	Platyhelminthes	Trematoda	Baltic Sea,North Sea, Celtic Sea and South European Atlantic Shelf
Echinostomatidae sp. no. 8	Platyhelminthes	Trematoda	North Sea
Echinostomatidae sp. no. 9	Platyhelminthes	Trematoda	South European Atlantic Shelf
Psilochasmus aglyptorchis	Platyhelminthes	Trematoda	North Sea
Psilochasmus oxyurus	Platyhelminthes	Trematoda	Baltic Sea
Psilostomum brevicolle	Platyhelminthes	Trematoda	North Sea, Celtic Sea and South European Atlantic Shelf
Cryptocotyle jejuna	Platyhelminthes	Trematoda	North Sea, Celtic Sea and South European Atlantic Shelf
Cryptocotyle lingua	Platyhelminthes	Trematoda	Baltic Sea
Cryptocotyle concava	Platyhelminthes	Trematoda	Baltic Sea,North Sea, Celtic Sea and South European Atlantic Shelf
Pygidiopsis ardae	Platyhelminthes	Trematoda	North Sea, Celtic Sea and South European Atlantic Shelf
Paramonostomum alveatum	Platyhelminthes	Trematoda	Baltic Sea
Notocotylid sp. no. 10	Platyhelminthes	Trematoda	North Sea, Celtic Sea and South European Atlantic Shelf
Notocotylid sp. no. 11	Platyhelminthes	Trematoda	North Sea, Celtic Sea

Notocotylid sp. no. 12	Platyhelminthes	Trematoda	North Sea, Celtic Sea
Cercaria microphallidarum	Platyhelminthes	Trematoda	Baltic Sea
Microphalllus claviformis	Platyhelminthes	Trematoda	Baltic Sea,North Sea, Celtic Sea and South European Atlantic Shelf
Maritrema subdolum	Platyhelminthes	Trematoda	Baltic Sea,North Sea, Celtic Sea and South European Atlantic Shelf
Microphallid sp. no. 15	Platyhelminthes	Trematoda	North Sea, Celtic Sea and South European Atlantic Shelf
Microphallid sp. no. 16	Platyhelminthes	Trematoda	South European Atlantic Shelf
Maritrema oocysta	Platyhelminthes	Trematoda	Noth Sea, Celtic Sea
Microphallus pirum	Platyhelminthes	Trematoda	North Sea
Microphallus abortivus	Platyhelminthes	Trematoda	North Sea, Celtic Sea and South European Atlantic Shelf
Levinseniella sp. no. 17	Platyhelminthes	Trematoda	North Sea, Celtic Sea and South European Atlantic Shelf
Microphallus primas	Platyhelminthes	Trematoda	Noth Sea, Celtic Sea
Microphallus scolectroma	Platyhelminthes	Trematoda	North Sea
Microphallus papillorobustus	Platyhelminthes	Trematoda	Baltic Sea
Levinseniella brachysoma	Platyhelminthes	Trematoda	North Sea, Celtic Sea
Cercaria camarguensis	Platyhelminthes	Trematoda	North Sea and South European

							Atlantic Shelf	
Levinseniella sp.	Platyhelminthes	Trematoda					Baltic Sea	
Timoniella praeterita	Platyhelminthes	Trematoda					North Sea, Celtic Sea and South European Atlantic Shelf	
Timoniella imbutiforme (Acanthostomum balthium)	Platyhelminthes	Trematoda					Baltic Sea	
Cryptocotyle concava	Platyhelminthes	Trematoda				Indirect impact on diatoms community: parasites reduce snail's bioturbation activity and, by a cascade effect primary production. Parasites also influence diatoms' communities (favorization of epipelic diatoms)	Denmark	(Mouritsen & Haun 2008)
Himasthla spp.	Platyhelminthes	Trematoda						
Maritrema spp.	Platyhelminthes	Trematoda						
Microphallus claviformis	Platyhelminthes	Trematoda						
Microphallus claviformis	Platyhelminthes	Trematoda	Sporocyst	1.5 ± 1.3	363-470 (4 sites)		Germany	(Thieltges et al. 2006)
Maritrema subdolum	Platyhelminthes	Trematoda	Sporocyst	3.5 ± 1.5				
Maritrema gratiosum	Platyhelminthes	Trematoda	Sporocyst	0.2 ± 0.4				
Levinseniella brachysoma	Platyhelminthes	Trematoda	Sporocyst	0.3 ± 0.6				
Himasthla continua	Platyhelminthes	Trematoda	Sporocyst	1.9 ± 1.2				
Himasthla interrupta	Platyhelminthes	Trematoda	Sporocyst	0.3 ± 0.2				
Cryptocotyle jejuna	Platyhelminthes	Trematoda	Sporocyst	0.1 ± 0.2				
Cryptocotyle concavum	Platyhelminthes	Trematoda	Sporocyst	0.5 ± 0.3				
Himasthla sp.	Platyhelminthes	Trematoda	Sporocyst	0.5 ± 0.7				
Notocotylus (Cercaria) ephemera	Platyhelminthes	Trematoda	Sporocyst	0.7 ± 0.7				
Psilochasmus aglyptorchis	Platyhelminthes	Trematoda	Sporocyst	0.2 ± 0.3				
Deropristis inflata	Platyhelminthes	Trematoda	Sporocyst	0.1 ± 0.1				
Haploporidae	Platyhelminthes	Trematoda		0 to 16 (community of parasites)	100 (3 sites, monthly samples over one year)		France	(de Montaudouin et al. 2003)
Himasthla spp.	Platyhelminthes	Trematoda		0 to 16 (community of parasites)				
Unindentified	Platyhelminthes	Trematoda	Sporocyst	0 to 16				

sporocysts				(community of parasites)				
Cryptocotyle concavum	Platyhelminthes	Trematoda		0 to 16 (community of parasites)		Increase of mortality		
Microphallidae	Platyhelminthes	Trematoda		0 to 16 (community of parasites)				
Notocotyle sp.	Platyhelminthes	Trematoda		0 to 16 (community of parasites)				
Cercaria sinitzini	Platyhelminthes	Trematoda		0 to 16 (community of parasites)				
Himasthla continua	Platyhelminthes	Trematoda	Cercariae	0 to 6.7	161-401 (3 sites)	Potentially associated with gigantism, may be associated to reduced ability to burry and to slower moving rates	United Kingdom	(Huxham et al. 1995)
Microphallidae sp. no. 15	Platyhelminthes	Trematoda	Cercariae	0.5 to 3.8				
Cryptocotyle jejuna	Platyhelminthes	Trematoda	Cercariae	0 to 0.5				
Notocotylidae sp. no. 10	Platyhelminthes	Trematoda	Cercariae	0 to 2.9				
Maritrema oocysta	Platyhelminthes	Trematoda	Metacercariae, cercariae	0 to 2.9				
Levinseniella sp. no. 17	Platyhelminthes	Trematoda	Metacercariae, cercariae	0 to 0.6				
Maritrema subdolum	Platyhelminthes	Trematoda	Cercariae			Reduced penis size, reduced oviposition rate, increased growth rate, females with higher egestion rates, reduced locomotory activity	Denmark	(Mouritsen & Jensen 1994)
Microphallus claviformis	Platyhelminthes	Trematoda	Cercariae					
Levinseniella sp.	Platyhelminthes	Trematoda	Cercariae					
Cryptocotyle concava	Platyhelminthes	Trematoda	Cercariae					
Himasthla continua	Platyhelminthes	Trematoda	Cercariae					
Atriophallus minutus (Levinseniella minuta)	Platyhelminthes	Trematoda	Metacercariae				France	(Deblock 1978)
Cercaria sinitzini	Platyhelminthes	Trematoda						
Bunocotyle progenetica	Platyhelminthes	Trematoda	Cercariae					
Deropristis inflata	Platyhelminthes	Trematoda	Cercariae					
Himasthla continua	Platyhelminthes	Trematoda	Cercariae					
Himasthla interrupta	Platyhelminthes	Trematoda	Cercariae					
Himasthla militaris?	Platyhelminthes	Trematoda	Cercariae					
Himasthla leptosoma?	Platyhelminthes	Trematoda	Cercariae					
Haploporidae sp. no. 3	Platyhelminthes	Trematoda	Cercariae					
Haploporidae sp. no.	Platyhelminthes	Trematoda	Cercariae					

	4									
	Haploporidae sp. no. 5	Platyhelminthes	Trematoda	Cercariae						
	Haploporidae sp. no. 6	Platyhelminthes	Trematoda	Cercariae						
	Haploporus benedeni	Platyhelminthes	Trematoda	Cercariae						
	Haplosporus sp. no. 7	Platyhelminthes	Trematoda	Cercariae						
	Echinostomatidae sp. no. 8	Platyhelminthes	Trematoda	Cercariae						
	Echinostomatidae sp. no. 9	Platyhelminthes	Trematoda	Cercariae						
	Psilostomum brevicolle	Platyhelminthes	Trematoda	Cercariae						
	Notocotylidae sp. no. 10	Platyhelminthes	Trematoda	Cercariae						
	Notocotylidae sp. no. 12	Platyhelminthes	Trematoda	Cercariae						
	Notocotylidae sp. no. 13	Platyhelminthes	Trematoda	Cercariae						
	Notocotylidae sp. no. 14	Platyhelminthes	Trematoda	Cercariae						
	Microphallus claviformis	Platyhelminthes	Trematoda	Cercariae						
	Maritrema subdolum	Platyhelminthes	Trematoda	Cercariae						
	Microphallidae sp. no. 15	Platyhelminthes	Trematoda	Cercariae						
	Microphallidae sp. no. 16	Platyhelminthes	Trematoda	Cercariae						
	Maritrema oocysta	Platyhelminthes	Trematoda	Cercariae						
	Microphallus pirum	Platyhelminthes	Trematoda	Cercariae						
	Levinseniella sp. no. 17 ?	Platyhelminthes	Trematoda	Cercariae						
	Cercaria camarguensis	Platyhelminthes	Trematoda	Cercariae						
	Cercaire ocellée sp. no. 20	Platyhelminthes	Trematoda	Cercariae						
	Cercaria tetralophocerca	Platyhelminthes	Trematoda	Cercariae						
	Cryptocotyle jejuna	Platyhelminthes	Trematoda	Cercariae						
	Timoniella praeteritum	Platyhelminthes	Trematoda	Cercariae						
	Gymnophallus glandosa	Platyhelminthes	Trematoda	Metacercariae						
Pirenella (Cerithideopsilla) cingulata	Unindentified cercaria	Platyhelminthes	Trematoda	Cercaria	4.8 to 38.5		42-73 (3 sites)		Thailand	(Sri-aroon et al. 2005)
	Cercaria caribbea	Platyhelminthes	Trematoda	Cercariae and sporocysts					South Korea	(Han et al. 2012)
***Polititapes aureus (Venerupis aurea)*[1]**	*Curtuteria arguinae*	Platyhelminthes	Trematoda	Metacercariae		1.1	10		France	(Dang et al. 2009)
	Himasthla sp.	Platyhelminthes	Trematoda	Metacercariae		21.1				
	Diphterostomum brusinae	Platyhelminthes	Trematoda	Metacercariae		0.7				
	Unknown	Platyhelminthes	Trematoda	Metacercariae		19.2				

	Metacercariae									
Ruditapes decussatus[1]	*Curtuteria arguinae*	Platyhelminthes	Trematoda	Metacercariae		1.2				
	Himasthla sp.	Platyhelminthes	Trematoda	Metacercariae		2				
	Parvatrema (Meiogymnophallus) fossarum	Platyhelminthes	Trematoda	Metacercariae		83.5 to 139.9		10		Spain
	Bucephalus labracis	Platyhelminthes	Trematoda	Sporocyst, cercaria	0 to 0.11			84-176 per sampling time (monthly samples over one year)		Tunisia
	Cercaria lata	Platyhelminthes	Trematoda	Sporocyst, cercaria	10.2 to 23.8					
	Caecincola parvulus	Platyhelminthes	Trematoda	Metacercariae	0 to 0.1		1			
	Acanthoparyphium sp.	Platyhelminthes	Trematoda	Metacercariae	1.1 to 22.7		4.2 to 16.8			
	Curtuteria australis	Platyhelminthes	Trematoda	Metacercariae	13.9 to 61.1		6.9 to 12.2			
	Parvatrema (Gymnophallus) fossarum	Platyhelminthes	Trematoda	Metacercariae	23.2 to 98.4		7.1 to 213			
	Parvatrema (Gymnophallus) rebecqui	Platyhelminthes	Trematoda	Metacercariae	0 to 3.5		3.2 to 7.6			
	Lepocreadium pegorchis	Platyhelminthes	Trematoda	Metacercariae	0 to 0.1		1			
	Psilostomum brevicolle	Platyhelminthes	Trematoda	Metacercariae	0 to 1.2		0.4 to 1.2			
	Robphildollfusium fractum	Platyhelminthes	Trematoda	Metacercariae	0 to 0.1		1			
	Parazoogonus sp.	Platyhelminthes	Trematoda	Metacercariae	0.01		1			
Ruditapes philippinarum[1]	*Mytilicola*-like	Arthropoda	Hexanauplia		0 to 4			25 per site (2 sites)		Canada
	Cercaria tapidis	Platyhelminthes	Trematoda	Sporocyst	0 to 12			48-50 per sampling time (14 samples)	Castration, alteration of connective tissues	South Korea
	Curtuteria arguinae	Platyhelminthes	Trematoda	Metacercariae		0.1 to 0.7		10 per sampling time (monthly samples over 1 year)		France
	Himasthla sp.	Platyhelminthes	Trematoda	Metacercariae		0.1 to 0.2				
	Psilostomum brevicolle	Platyhelminthes	Trematoda	Metacercariae		0.3				
	Himasthla alincia	Platyhelminthes	Trematoda	Metacercariae	25	8.8 (intensity)		10		South Korea
	Parvatrema duboisi	Platyhelminthes	Trematoda	Sporocyst, cercaria, metacercaria	97.5		61.3 ± 93.5	40		Japan
	unindentified sporocysts	Platyhelminthes	Trematoda	Sporocyst	7.5 to 10			40 per site (2 sites)		South Korea
	unindentified Metacercariae	Platyhelminthes	Trematoda	Metacercariae	15 to 20		0.33 ± 1.05 to 0.45 ± 1.38			
	unindentified cestodes	Platyhelminthes	Cestoda		15 to 22.5		0.2 ± 0.56 to 0.43 ± 1.08 (intensity)			
	Himashtla alincia	Platyhelminthes	Trematoda	Metacercariae	30 to 80		1.6 to 5.8	10 and 15 (2 sites)		South Korea
	Parvatrema sp.	Platyhelminthes	Trematoda	Metacercariae	6.7 to 100		126 to 238			

	Nymphonella tapeti	*Arthropoda*	Pycnogonida		27 to 86	1.9 to 3.2	50-59 (3 sampling types)	Reduced burial ability, lower somatic index, reduced adductor strength	Japan	(Tomiyama et al. 2016)
Scrobicularia plana[1]	*Parvatrema minutum (Meiogymnophallus minutus)*	Platyhelminthes	Trematoda	Sporocyst, Cercariae	10.5 to 22		50-56 per sampling time (monthly samples over one year)		Ireland	(Fermer et al. 2010)
	Proctoeces (subtenuis) maculatus	Platyhelminthes	Trematoda	Adult	0 to 98	0.016 ± 0.016 to 4.4 ± 0.4	10-55 per sampling time (8 sites with 3 samplings)		United Kingdom	(White 1972)
	Afropinnotheres monodi	Arthropoda	Malacostraca		4.1	1	9441		Spain	(Drake et al. 2014)
	Oxydromus (Parasyllidea) humesi	Annelida	Polychaeta		0.2 to 4.7	1	269-1065 (5 sampling times)	Reduced biomass	Spain	(Martin et al. 2012)
	Tetrastemma fozensis	Nemerta	Enopla		0 to 100	1 to 2	45-72 (6 sampling sites)		Spain	(Thiel & Zubillaga 1997)
	Parvatrema (Gymnophallus) fossarum	Platyhelminthes	Trematoda	Sporocyst, Cercariae					France	(Bartoli 1972)
Spisula subtruncata[1]										
Tagelus plebeius	Gymnophallidae	Platyhelminthes	Trematoda	Metacercariae				Increased susceptibility to predation	Argentina	(Addino et al. 2010)
	Parvatrema sp.	Platyhelminthes	Trematoda	Metacercariae	0 to 100		17-33 (3 sampling times)		Argentina	(da Silva et al. 2009)
	Echinostomatidae	Platyhelminthes	Trematoda	Metacercariae	0 to 26.7					
	Fellodistomidae	Platyhelminthes	Trematoda	Sporocyst	0 to 0.96		14-104 (3 sites)		Argentina	(Vazquez et al. 2006)
	Gymnophallidae	Platyhelminthes	Trematoda	Sporocyst, Metacercariae	0.96 to 100					
	Spirurida	Nematoda	Chromodorea		21.4 to 35.6					
Terebralia palustris										
Theora lata										
Tritia (Cyclope) neritea	*Macvicaria obovata*	Platyhelminthes	Trematoda	Metacercariae	96.7 to 100		60 and 69 (2 sampling times)		Spain	(Born-Torrijos et al. 2012)
	Microphallidae	Platyhelminthes	Trematoda		0 to 1		29-33 (3 sites)		France	(Bachelet et al. 2004)
Tritia (Ilyanassa) obsoleta	*Pleurogonius malaclemys*	Platyhelminthes	Trematoda	Redia	1.2 to 2.6		3922		United States	(Chodkowski et al. 2016)
	Pleurogonius malaclemys	Platyhelminthes	Trematoda	Metacercariae	57.9	2.6 ± 2.4				
	Himasthla quissetensis	Platyhelminthes	Trematoda	Sporocysts	2.9					
	Zoogonus lasius	Platyhelminthes	Trematoda	Sporocysts	2.3			Castration		

	Austrobilharzia variglandis	Platyhelminthes	Trematoda	Larval stages (sporocysts or rediae)	1.7				
	Stephanostomum tenue	Platyhelminthes	Trematoda	Larval stages (sporocysts or rediae)	0.2				
	Lepocreadium setiferoides	Platyhelminthes	Trematoda	Redia	0.1				
	Gynaecotyla adunca	Platyhelminthes	Trematoda	Larval stages (sporocysts or rediae)	0.03				
	Diplostomum nassa	Platyhelminthes	Trematoda	Larval stages (sporocysts or rediae)	0.03				
	Gynaecotyla adunca	Platyhelminthes	Trematoda	Larval stages (sporocysts or rediae)	16 to 21			Canada	(Shim et al. 2013)
	Lepocredium setiferoides	Platyhelminthes	Trematoda	Larval stages (sporocysts or rediae)	0 to 16 %				
	Zoogonus rubellus	Platyhelminthes	Trematoda		7.8 to 13	1955-2660 (3 sites)		United States	(Blakeslee et al. 2012)
	Lepocreadium setiferoides	Platyhelminthes	Trematoda		5.4 to 5.8				
	Stephanostomum tenue	Platyhelminthes	Trematoda		0.5 to 7.1				
	Stephanostomum dentatum	Platyhelminthes	Trematoda		0.8 to 4.1				
	Himasthla quissetensis	Platyhelminthes	Trematoda		0.2 to 4.7				
	Austrobilharzia variglandis	Platyhelminthes	Trematoda		0.05 to 0.6				
	Gynaecotyla adunca	Platyhelminthes	Trematoda		0.15 to 1				
	Diplostomum nassa	Platyhelminthes	Trematoda		0 to 0.26				
	Pleurogonius malaclemys	Platyhelminthes	Trematoda		0 to 0.7				
	Zoogonus rubellus	Platyhelminthes	Trematoda		0 to 1.4				
	Lepocreadium setiferoides	Platyhelminthes	Trematoda		0 to 1.0				
	Stephanostomum tenue	Platyhelminthes	Trematoda		0 to 0.4				
	Himasthla quissetensis	Platyhelminthes	Trematoda		0.7 to 4.7				
	Austrobilharzia variglandis	Platyhelminthes	Trematoda		0.6 to 3.1				
Turritella communis	*Cercaria pythionoke*	Platyhelminthes	Trematoda	Cercariae	2	541		United Kingdom	(Rothschild 1935)
	Cercaria herpsyllis	Platyhelminthes	Trematoda	Cercariae	0.5				
	Cercaria doricha	Platyhelminthes	Trematoda	Cercariae	5				
	Cercaria nicarete	Platyhelminthes	Trematoda	Cercariae	1				
	Cercaria ampelis	Platyhelminthes	Trematoda	Cercariae	4				
	Cercaria ranzii	Platyhelminthes	Trematoda	Cercariae	1				
Yoldia hyperborea									
Yoldia limatula									

SIPUNCULA					
Sipunculus (Sipunculus) nudus[1]	*Myzomolgus sipunculensis*	Arthropoda	Hexanauplia	Brazil	(Kihara et al. 2007)
	Myzomolgus stupendus	Arthropoda	Hexanauplia	France	
	Myzomolgus tenuis	Arthropoda	Hexanauplia	South Korea	

[1] Bioturbating species of economic interest (wild-caught or farmed).

Table S3 List of microparasites reported for bioturbating species (identified in Supplement 1). When available, prevalence (percentage of infestation in the population) is given. The size of the samples are given as well. Potential impacts on the host are reported.

Bioturbating species	Microparasite species	Phylum	Class	Prevalence (%)	N	Impact on the host	Location	Reference
ANNELIDA								
Abarenicola affinis								
Abarenicola pacifica								
Alitta virens								
Arenicola marina								
Axiothella rubrocincta	*Haplozoon axiothellae*	Miozoa	Dinophyceae				United States	(Siebert 1973)
Capitella cf. teleta								
***Capitella* spp.**	*Ancora sagittata*	Myzozoa	Conoidasida				Denmark, Sweden	(Ronny Larsson & Køie 2006)
	Sphaerospora dicentrarchi	Cnidaria	Myxozoa	0 to 0.1	121 and 916 (2 sites)		Portugal	(Rangel et al. 2016)
Cirratulus grandis								
Cirriformia filigera								
***Clymenella* sp.**	*Pterospora clymenellae*	Myzozoa	Conoidasida	28.6	35		United States	(Landers 1991)
Clymenella torquata								
Diopatra cuprea								
Eupolymnia heterobranchia								
Eupolymnia nebulosa								
Glycera alba								
Hediste (Neanthes) japonica								
Hediste (Nereis) diversicolor	Undefined Myxosporea (gen. *Tetractinomyxon*)	Cnidaria	Myxozoa	2	50		Denmark	(Køie 2000)
	Ellipsomyxa (Zschokkella) mugilis	Cnidaria	Myxozoa	0 to 3.2	126-528 (seasonal samples over one year)		Portugal	(Rangel et al. 2009)
	Eucoccidium (Coelotropha) duchorni	Myzozoa	Conoidasida				France	(Porchet-Hennere 1967)
	Iridovirus						France	(Devauchelle & Durchon 1973)
	Lecudina tuzetae	Myzozoa	Conoidasida				France	(Kuriyama et al. 2005)
Heteromastus filiformis								
Heteromastus similis								

Kinbergonuphis (Onuphis) jenneri							
Laeonereis culveri (acuta)							
Lanice conchilega							
Lipobranchius jeffreysii							
Lumbrineris latreilli							
Maldane sarsi							
Marenzelleria arctia							
Marenzelleria neglecta							
Marenzelleria viridis							
Maxmuelleria lankesteri							
Melinna cristata							
Melinna palmata							
Naineris laevigata	*Kudoa septempunctata*	Cnidaria	Myxozoa	0 to 40	62 to 126 (7 sampling times)	Korea	(Paari et al. 2017)
Nephtys caeca							
Nephtys hombergii							
Nephtys incisa							
Notomastus latericeus							
***Notomastus* sp.**							
Owenia fusiformis							
Pectinaria gouldii							
Perinereis aibuhitensis							
Perinereis nuntia							
Polydora ciliata							
Pygospio elegans	*Lecudina* spp.	Myzozoa	Conoidasida			United States	(Douglass & Jones 1991)
	Coccidium spp.	Myzozoa	Conoidasida	80		United States	(Douglass & Jones 1991)
Scalibregma inflatum							
Scoloplos armiger	*Eleutheroschizon duboscqi*	Myzozoa	Conoidasida			Russia	(Valigurová et al. 2015)
***Thalassodrilides* sp.**	*Endocapsa rosulata*	Cnidaria	Myxozoa			Australia	(Hallett et al. 1999)
	Sphaeractinomyxon ersei	Cnidaria	Myxozoa			Australia	(Hallett et al. 1999)
Timarete (Cirriformia) luxuriosa							
Urechis caupo							

ARTHROPODA								
Alpheus macellarius[1]								
Austinogebia edulis								
Austrohelice crassa[1]								
Austruca (Uca) annulipes								
Austruca (Uca) triangularis								
Biffarius (Callianassa) filholi								
Biffarius arenosus								
Callianassa subterranea								
Callichirus (Callianassa) kraussi								
Callichirus islagrande								
Calocaris templemani								
Corallianassa longiventris								
Corophium arenarium								
Corophium volutator	Unknown microsporidian	Microsporidia		females =27, males = 1.5	306 females, 65 males	Increase of offsprings production	Canada	(Mautner et al. 2007)
Cranuca (Uca) inversa								
Cyrtograpsus angulatus	*Epistylis* sp.	Ciliophora	Oligohemenophorea		65		Argentina	(Alda et al. 2011)
	White spot syndrome virus		Nimaviridae	0 to 66.7	6 to 16 (2 sampling times)		Argentina	(Martorelli et al. 2010, 2017)
Dotilla fenestrata								
Eriocheir sinensis[1]	*Hepatospora (Endoreticulatus) eriocheir*	Microsporidia	Microsporea	0 to 18.8	23 and 64 (2 sampling sites)		China	(Wang & Chen 2007)
	Hepatospora eriocheir (Endoreticulatus eriocheir)	Microsporidia	Microsporea	up to 70	60 per month over one year		United Kingdom	(Stentiford et al. 2011)
	Aphanomyces astaci	Oomycota	Saprolegniales	100	6		Sweden	(Svoboda et al. 2014)
	Hepatospora eriocheir	Microsporidia	Microsporea			Hypertrophy of hepatopancreatic cells, metabolic stress	China	(Ding et al. 2018)
	Spiroplasma eriocheiris	Tenericutes	Mollicutes			Associated with tremor disease. Could be related to mass mortality	China	(Wang & Gu 2002, Wang et al. 2011)
	White spot syndrome virus					Increase of mortality rate	China	(Ding et al. 2015)
	Eriocheir sinensis ronivirus (*Es*RNV)					Increase of mortality rate	China	(Zhang & Bonami 2007)
	Vibrio parahaemolyticus	Proteobacteria	Gammaproteobacteria	100			United Kingdom	(Wagley et al. 2009)
	Vibrio	Proteobacteria	Gammaproteobacteria	89.5	19		China	(Yano et al.

	parahaemolyticus						2006)
Eucalliax panglaoensis							
Gelasimus (Uca) vocans							
Glypturus (Callichirus) armatus							
Glypturus (Callichirus) laurae							
Helice formosensis[1]							
Helice tientsinensis[1]							
Heloecius cordiformis							
Hemigrapsus oregonensis	*Taeniella grandis*	Choanozoa	Ichthyosporea	50		United States	(McDermott 2011)
	Taeniella carcini	Choanozoa	Ichthyosporea				
Hemiplax hirtipes							
Hyas araneus	*Hematodinium* sp.	Myzozoa	Dynophycae	45	40	Greenland	(Eigemann et al. 2010)
Laomedia astacina							
Lepidophthalmus bocourti							
Lepidophthalmus louisianensis							
Lepidophthalmus sinuensis							
Leptocheirus plumulosus							
Leptuca (Uca) crenulata							
Leptuca (Uca) cumulanta							
Leptuca (Uca) leptodactyla							
Leptuca (Uca) panacea							
Leptuca (Uca) uruguayensis							
Macrophthalmus japonicus							
Mictyris longicarpus							
Minuca (Uca) longisignalis							
Minuca (Uca) pugnax							
Monoporeia affinis	Unknown microsporidian	Microsporidia	Microsporea	12		Sweden	(Jacobson et al. 2010)
Neaxius acanthus							
Neohelice (Chasmagnathus) granulata[1]	White spot syndrome virus		Nimaviridae	23.3	150	Brazil	(Marques et al. 2011)
	Clostridium perfringens	Firmicutes	Clostridia			Argentina	(La Sala et al. 2015)
	Undefined filamentous bacteria			11	36	Argentina	(Alda et al. 2011)
	Epistylis sp.	Ochropyta		8			

	Infectious hypodermal and hematopoietic necrosis virus			0 to 88	30 and 50 (2 sites)	Brazil	(Cavalli et al. 2013)
Neotrypaea californiensis							
Pestarella (Callianassa) tyrrhena							
Pontoporeia femorata							
Sarsamphiascus (Amphiascus) tenuiremis							
Sergio trilobata							
Sesarma reticulatum[1]							
Sphaeroma quoianum							
Trypaea australiensis							
Tubuca (Uca) forcipata							
Tubuca (Uca) paradussumieri							
Tubuca (Uca) rosea							
Uca maracoani							
Ucides cordatus[1]	*Exophiala cancerae*	Ascomycota	Eurotiomycetes			Causing lethargic crab disease (LCD), increase of mortality, moribund crab, necrosis of tissue, destruction of gills lamellae tissue, haemocytic infiltration	(Vicente et al. 2012)
	Fonsecaea brasiliensis	Ascomycota	Eurotiomycetes				
Upogebia africana							
Upogebia deltaura							
Upogebia major							
Upogebia pugettensis							
Upogebia pusilla							
Victoriopisa australiensis							
CEPHALORHYNCHA							
Halicryptus spinulosus							
ECHINODERMATA							
Abatus ingens[1]							
Amphiura chiajei							
Amphiura filiformis							
Apostichopus (Stichopus) japonicus[1]	*Boveria labialis*	Ciliophora	Oligohemenophorea			Associated with massive mortality	China (Zhan et al. 2018)
	Boveria subcylindrica	Ciliophora	Oligohemenophorea				
	Vibrio cyclitrophicus	Proteobacteria	Gammaproteobacteria		20 per year (3 years)	Pathogens of skin ulceration disease, associated with high mortality rate	China (Deng et al. 2009)
	Vibrio tasmaniensis	Proteobacteria	Gammaproteobacteria				
	Vibrio harveyi	Proteobacteria	Gammaproteobacteria				
	Vibrio splendidus	Proteobacteria	Gammaproteobacteria				
	Photobacterium sp.	Proteobacteria	Gammaproteobacteria				

	Spherical viruses			Pathogen of viscera ejection syndrome, associated with high mortality rate		
	Pseudoalteromonas tetraodonis	Proteobacteria	Gammaproteobacteria	Pathogens of skin ulceration and peristome tumescence, associated with decrease of tentacle activity	China	(Liu et al. 2010)
	Pseudoalteromonas sp.	Proteobacteria	Gammaproteobacteria			
	Skin ulceration and peristome tumescence syndrome virus (SUPTSV)					
	Arenibacter latericius	Bacteroidetes	Flavobacteria		Russia	(Ivanova et al. 2001)
	Salegentibacter holothuriorum	Bacteroidetes	Flavobacteria		Russia	(Nedashkovskaya 2004)
	Vibrio alginolyticus	Proteobacteria	Gammaproteobacteria		China	(Zhang et al. 2015)
	Shewanella marisflavi	Proteobacteria	Gammaproteobacteria	Viscera ejection, swollen mouth, skin ulceration, increase of mortality rate	China	(Li et al. 2010)
	Aeromonas salmonicida	Proteobacteria	Gammaproteobacteria	Pathogen of bacterial ulceration disease, increase of mortality rates at low temperatures	China	(Yang et al. 2008)
Australostichopus mollis						
Brisaster latifrons[1]						
Brissopsis lyrifera						
Balanoglossus aurantiaca						
Echinocardium cordatum[1]	*Lithocystis schneideri*	Myzozoa	Conoidasida	Initiation of a coelomocytic reaction	France	(De Ridder & Jangoux 1984)
Encope emarginata[1]						
Holothuria (Halodeima) atra[1]						
Holothuria princeps[1]						
Holothuria tubulosa[1]						
Holothuria (Microthele) whitmaei[1]						
Molpadia oolitica[1]						
Oestergrenia (Labidoplax) digitata						
Peronella lesueuri[1]						
Stichopus chloronotus[1]						
Stichopus herrmanni[1]						
HEMICHORDATA						
Saccoglossus bromophenolosus						
***Schizocardium* sp.**						

MOLLUSCA								
Abra alba								
Abra nitida								
Abra segmentum (ovata)								
Austrovenus stutchburyi[1]								
Batillaria flectosiphonata								
Batillaria zonalis								
Cerastoderma edule[1]	*Minchinia mercenariae*-like parasite	Cercozoa	Ascetosporea	4.6 to 10	22 to 32 (5 sampling times)		Spain	(Ramilo et al. 2018)
	Disseminated neoplasia (unknown etiological agent)			0 to 50		Haemocytic infiltration	Spain	(Villalba et al. 2014)
	Marteilia cochillia	Cercozoa	Ascetosporea	0 to 100		Causing marteiliosis, heavy haemocytic infiltration in the connective tissue, destruction of digestive tubules, increase of mortality rates		
	Perkinsus chesapeaki	Myzozoa	Perkinsea	23.3 to 84.4	30 per sampling time (7 sampling time)		Spain	(Carrasco et al. 2014)
	Disseminated neoplasia (unknown etiological agent)			15.0 to 38.3	60 to 95 (6 sampling times)	Haemocytic infiltration, may enhance surfacing of cockles	Ireland	(Morgan et al. 2012)
	Steinhausia sp.	Microsporidia	Microsporea	11.8 to 20.0	30 to 60 (3 sites)		France	(Comtet et al. 2003)
	Haplosporidium edule	Cercozoa	Ascetosporea				Spain	(Azevedo et al. 2003)
	Disseminated neoplasia (unknown etiological agent)			0 to 32	30 per site (34 sites)	Haemocytic infiltration	Spain	(Carballal et al. 2001)
	Nematopsis sp.	Myzozoa	Conoidasida	30 to 100		Haemocytic reaction		
	Rickettsia-like	Proteobacteria	Alphaproteobacteria	0 to 43				
	Pseudoklossia sp.	Myzozoa	Conoidasida	0 to 39		Hypertrophy of renal cells		
	Bacterial extracellular cysts			0 to 93		Alteration of gill architecture in heavily infected organisms		
	Perkinsus sp.	Myzozoa	Perkinsea	3 to 67	30 per site (5 sites)		France	(Lassalle et al. 2007)
	Vibrio tapetis	Proteobacteria	Gammaproteobacteria	17 to 43		Sometimes associated with brown ring disease signs		
	Vibrio tapetis	Proteobacteria	Gammaproteobacteria			Increased mortality rates, modifications of genes expression, induction of oxidative burst, reduced haemocytes adhesion		(Paul-Pont, Gonzalez, et al. 2010)
Chamelea gallina	*Perkinsus mediterraneus*	Myzozoa	Perkinsea	25	24		Spain	(Valencia et al. 2014)
	Marteilia refringens	Cercozoa	Ascetosporea	4.4	69	Associated to important mortality event	Spain	(López-Flores et al. 2008)
	Vibrio	Proteobacteria	Gammaproteobacteria				Italy	(Rahman et

	parahaemolyticus							al. 2017)
	Nematopsis sp.	Myzozoa	Conoidasida	100	1172			(Berrilli et al. 2000)
	Porospora sp.	Myzozoa	Conoidasida	0.6				
	Ancistrum sp.	Ciliophora	Oligohemenophorea	5.5				
	Boveria sp.	Ciliophora	Oligohemenophorea	13.8				
***Cyclina sinensis*[1]**								
***Ensis leei (arcuatus var. directus)*[1]**	Prokaryote-like colonies			0 to 1.8	135 to 165 (3 sites)		Spain	(Darriba et al. 2010)
	Renal coccidia	Myzozoa	Conoidasida	16.5 to 19.6				
	Nematopsis sp.	Myzozoa	Conoidasida	49.6 to 89.1				
***Fabulina fabula*[1]**								
***Limecola (Macoma) balthica*[1]**	*Perkinsus chesapeaki*	Myzozoa	Perkinsea				United States	(Burreson et al. 2005)
	Disseminated neoplasia (unknown etiological agent)			0 to 26.1	5 to 199 per sampling time (29 times)		Finland	(Pekkarine n 1993)
***Limecola (Macoma) contabulata*[1]**								
Macomangulus (Angulus) tenuis								
Macoma nasuta								
Macomona (Tellina) deltoidalis								
***Macomona liliana*[1]**								
Macoploma (Macoma) tenta								
***Meretrix meretrix*[1]**	*Trichodina meretricis*	Ciliophora	Oligohemenophorea				China	(Xu et al. 1999)
	Nematopsis spp.	Myzozoa	Conoidasida	44	50		Saudi Arabia	(Abdel-Baki et al. 2012)
	Perkinsus sp.	Myzozoa	Perkinsea	48				
	Marteilia spp.	Cercozoa	Ascetosporea	0.19	1026		China	(Xie & Xie 2018)
	Vibrio vulnificus	Proteobacteria	Gammaproteobacteria	28.5	26		India	(Sangeetha et al. 2017)
	Vibrio parahaemolyticus	Proteobacteria	Gammaproteobacteria	20 to 29.4 %	5 and 17 (2 sampling times)		Thailand	(Vuddhaku l et al. 2006)
	Vibrio sp. strain MM5	Proteobacteria	Gammaproteobacteria			Increase of mortality	China	(Yue et al. 2011)
***Mya arenaria*[1]**	*Perkinsus* spp. (probably *marinus* and *chesapeki*)	Myzozoa	Perkinsea	11.7	240	Lesions in the gills connective tissues (loss of tissue structure), lesions in the digestive gland and gonadic gland, haemocytic infiltration in muscle tissues. May affect fertitliy and growth	United States	(McLaughl in & Faisal 1998)
	Disseminated neoplasia (unknown etiological agent)			19 to 43	30 to 189 (18 sampling times)	Increase of mortality	United States	(Cooper et al. 1982)
	Campylobacter sp.	Proteobacteria	Epsilonproteobacteria	47.2	72		Canada	(Lévesque et al. 2006)
	Cryptosporidium parvum	Myzozoa	Conoidasida	70.7				

	Giardia sp.			63.4				
	Salmonella sp.	Proteobacteria	Gammaproteobacteria	1.4				
Nucula hanleyi								
Nucula nitidosa								
Nucula proxima (annulata)								
Nuculana (Nuculana) pernula								
Nuculana minuta								
Nuttallia japonica								
Peringia (Hydrobia) ulvae								
Pirenella (Cerithideopsilla) cingulata								
Polititapes aureus (Venerupis aurea) [1]	*Perkinsus olsenii*	Myzozoa	Perkinsea				Spain	(Ramilo et al. 2015)
Ruditapes decussatus [1]	*Vibrio alginolyticus*	Proteobacteria	Gammaproteobacteria			Increase of mortality of larvae	Tunisia	(Mechri et al. 2015)
	Vibrio tubiashii subsp. *europaeus*	Proteobacteria	Gammaproteobacteria			Increase of mortality of larvae	Spain	(Dubert et al. 2017)
	Vibrio barjaei	Proteobacteria	Gammaproteobacteria				Spain	(Dubert, Balboa, et al. 2016)
	Vibrio spp. (*V. alginolyticus, V. cholerae, V. parahaemolyticus*)	Proteobacteria	Gammaproteobacteria	51.8	83		Tunisia	(Gdoura et al. 2016)
	Marinomonas atlantica	Proteobacteria	Gammaproteobacteria				Spain	(Lasa et al. 2016)
	Marinomonas gallaica	Proteobacteria	Gammaproteobacteria					
	Vibrio bivalvicida	Proteobacteria	Gammaproteobacteria				Spain	(Dubert, Romalde, et al. 2016)
	Vibrio spp.	Proteobacteria	Gammaproteobacteria			Associated with Brown Ring Disease	Tunisia	(El Bour et al. 2011)
	Vibrio artabrorum	Proteobacteria	Gammaproteobacteria				Spain	(Dieguez et al. 2011)
	Vibrio atlanticus	Proteobacteria	Gammaproteobacteria					
	Vibrio breoganii	Proteobacteria	Gammaproteobacteria				Spain	(Beaz Hidalgo et al. 2009)
	Vibrio alginolyticus	Proteobacteria	Gammaproteobacteria			Increase of mortality of larvae	Spain	(Gomez-Leon et al. 2005)
	Vibrio splendidus	Proteobacteria	Gammaproteobacteria			Increase of mortality of larvae		
	Vibrio tapetis	Proteobacteria	Gammaproteobacteria	20 to 40			France, Spain	(Paillard 2004)
	Cryptosporidium sp.	Myzozoa	Conoidasida				Portugal	(Azevedo 1989a)
	Perkinsus olsenii (atlanticus)	Myzozoa	Perkinsea	100% in clams with gaping valves			Portugal	(Azevedo 1989b)
	Rickettsia-like organisms	Proteobacteria	Alphaproteobacteria	3 to 20	28-60 (3sites)		Spain	(Navas et al. 1992)
	Perkinsus olsenii	Myzozoa	Perkinsea	66.6 to 92.9				

(atlanticus)							
Nematopsis sp.	Myzozoa	Conoidasida	0 to 3.4				
Coccidians	Myzozoa	Conoidasida	0 to 5.1				
Microsporidia-like organisms	Microsporidia		0 to 6.8				
Trichodina sp.	Ciliophora	Oligohemenophorea	3.3 to 15.4				
Minchinia tapetis	Cercozoa	Ascetosporea	32.1 to 96.6				
Brown ring disease			0.9 to 93.3	30 per site (4 sites)		Spain	(Figueras et al. 1996)
Brown ring disease			11.1 to 37			Portugal	
Chlamydia-like organisms			10 to 86.2			Spain	
Chlamydia-like organisms			30 to 71.4			Portugal	
Haplosporidia-like organisms (HLOs)	Cercozoa	Ascetosporea	3.3 to 100			Spain	
Haplosporidia-like organisms (HLOs)	Cercozoa	Ascetosporea	0 to 20			Portugal	
Perkinsus-like organisms	Myzozoa	Perkinsea	0 to 60			Spain	
Urosporidium sp.	Cercozoa	Ascetosporea	36 to 71.4	overall = 184		Spain	(Novoa et al. 2004)
Perkinsus olsenii	Myzozoa	Perkinsea	20 to 100	40 per sampling time (7 samplings)		Spain	(Elandaloussi et al. 2009)
Perkinsus olsenii	Myzozoa	Perkinsea			Reduced bioturbation activity (lower ability to remobilize iron)		(Simão et al. 2010)
Perkinsus olsenii	Myzozoa	Perkinsea			Inhibition of gonadic development	Spain	(Casas & Villalba 2012)
Perkinsus olsenii	Myzozoa	Perkinsea				France	(Arzul et al. 2012)
Perkinsus chesapeaki	Myzozoa	Perkinsea					
Marteilia refringens	Cercozoa	Ascetosporea	0 to 68.9	30 per sampling time (monthly sample over one year)		France	(Boyer et al. 2013)
Perkinsus olsenii	Myzozoa	Perkinsea	46 to 100	25 per sampling time (monthly sample over 2 years)	Increase of mortality	Spain	(Villalba et al. 2005)
Perkinsus olsenii	Myzozoa	Perkinsea	0 to 80	35 per sampling time (3 sites sampled twice a year for 4 years)		Tunisia	(El Bour et al. 2012)
Brown ring disease			0 to 20	100 per sampling time (3 sites sampled twice a year for 4 years)			
Lacinutrix venerupis	Bacteroidetes	Flavobacteria		30 per		Spain	(Lasa et al.

					sampling time (sample every 2 months over 2 years)			2015)
	Perkinsus olsenii	Myzozoa	Perkinsea	68 to 100		Reduced growth rate	Spain	(Dang et al. 2013)
Ruditapes philippinarum[1]	Ostreid herpes virus OsHV-1 in larvae						France	(Arzul et al. 2001)
	Herpes-like virus					Increase of mortality, cell lesions in connective tissues	France	(Renault et al. 2001)
	Brown muscle disease associated with virus-like particles			0 and 48	100 per sampling time (monthly samples over 1 year)	Associated with high mortality rates, lesions of the posterior adductor muscle (necrotic and atrophied muscular cells), conchiolin deposits	France	(Dang et al. 2008)
	Virus-like particles			26 to 93	29-150 per site (5 sites)	Associated with high mortality rates, hypertrophy of cells in connective tissues and striated muscle fibers, haemocytic infiltration	United Kingdom	(Bateman et al. 2012)
	Rickettsia-like organisms	Proteobacteria	Alphaproteobacteria	0 to 17.9	12-30 per site (4 sites)		Spain	(Navas et al. 1992)
	Perkinsus olsenii (atlanticus)	Myzozoa	Perkinsea	20 to 83.3		Haemocytic response with destruction of the tissue structure		
	Trichodina sp.	Ciliophora	Oligohemenophorea	0 to 13.5				
	Brown ring disease			6.6 to 84.2	19-106 per site (4 sites)		Spain	(Figueras et al. 1996)
	Brown ring disease			3.3 to 4.9			Portugal	
	Chlamydia-like organisms	Chlamydiae	Chlamidiia	11.5 to 41.6			Spain	
	Chlamydia-like organisms	Chlamydiae	Chlamidiia	10 to 16.6			Portugal	
	Haplosporidian-like organisms (HLOs)	Myzozoa	Perkinsea	0 to 19.2			Spain	
	Perkinsus-like organisms	Myzozoa	Perkinsea	0 to 8.3			Spain	
	Perkinsus sp.	Myzozoa	Perkinsea			Damages of the connective tissue, possible disturbance of the reproduction ability	Japan	(Hamaguchi et al. 1998)
	Trichodina ruditapicis	Ciliophora	Oligohemenophorea				China	(Xu et al. 1999)
	Perkinsus sp.	Myzozoa	Perkinsea	0 to 100	18-75 per site (22 sites)	May disturb reproduction and metabolism	South Korea	(Park & Choi 2001)
	Rickettsia or Chlamydia			8 to 32	25 per site (2 sites)		Canada	(Marshall et al. 2003)
	Trichodina sp.	Ciliophora	Oligohemenophorea	20 to 56	25 per site (2 sites)			
	Perkinsus sp.	Myzozoa	Perkinsea	6 to 86	48-50 per sampling time (14 samples)		South Korea	(Ngo & Choi 2004)
	Haplosporidium sp.	Cercozoa	Ascetosporea	2.5	40	Alterations of connective tissues	Japan	(Itoh et al. 2005)
	Marteilia sp.	Cercozoa	Ascetosporea	2.5				
	Marteilioides sp.	Cercozoa	Ascetosporea	2.5				
	Perkinsus sp.	Myzozoa	Perkinsea	0 to 80	30 per site (5 sites)		France	(Lassalle et al. 2007)

Vibrio tapetis	Proteobacteria	Gammaproteobacteria	20 to 40	30 per site (5 sites)	Sometimes associated with brown ring disease		
Perkinsus olsenii	Myzozoa	Perkinsea	Overall = 97	50	Alterations of connective tissues	Japan	(Dungan & Reece 2006)
Perkinsus honshuensis	Myzozoa	Perkinsea					
Perkinsus olsenii	Myzozoa	Perkinsea				France	(Arzul et al. 2012)
Perkinsus chesapeaki	Myzozoa	Perkinsea					
Perkinsus olsenii	Myzozoa	Perkinsea	43.3 to 76.7	30 per site (2 sites)		South Korea	(Yang et al. 2010)
Brown ring disease			1.4 to 5.7	70 per site (2 sites)			
Marteilioides sp.	Cercozoa	Ascetosporea	0.4	1840 over 23 sites		South Korea	(Yanin et al. 2013)
Marteilia granula	Cercozoa	Ascetosporea	0 to 28.6	6-14 (15 samples)		Japan	(Itoh et al. 2014)
Perkinsus olsenii	Myzozoa	Perkinsea	100	100-200 per sampling times (6 samples)	Increase of mortality	Italia	(Pretto et al. 2014)
Mikrocytos-like parasite			3 to 93.3	30 per site (4 sites)	Haemocytic infiltration	Spain	(Ramilo et al. 2014)
Perkinsus olsenii	Myzozoa	Perkinsea	0 to 46.7	30 per site (4 sites)		Spain	(Ramilo et al. 2016)
Vibrio tapetis	Proteobacteria	Gammaproteobacteria			Causing brown ring disease. Increase of mortality, conchiolin deposits		(Allam et al. 2002)
Vibrio tapetis	Proteobacteria	Gammaproteobacteria			Causing brown ring disease, weight loss, decrease of respiration and clearance rates in heavy infected clams	France	(Flye-Sainte-Marie et al. 2007)
Vibrio tapetis-like bacteria	Proteobacteria	Gammaproteobacteria	35.3 to 71	7 and 17 (2 sampling times)	Associated with signs of brown ring disease	Norway	(Paillard et al. 2008)
Vibrio breoganii	Proteobacteria	Gammaproteobacteria				Spain	(Beaz Hidalgo et al. 2009)
Vibrio gallaecicus	Proteobacteria	Gammaproteobacteria				Spain	(Beaz-Hidalgo et al. 2009)
Vibrio artabrorum	Proteobacteria	Gammaproteobacteria				Spain	(Dieguez et al. 2011)
Vibrio atlanticus	Proteobacteria	Gammaproteobacteria					
Vibrio celticus	Proteobacteria	Gammaproteobacteria				Spain	(Beaz-Hidalgo, Diéguez, et al. 2010)
Aliivibrio finisterrensis	Proteobacteria	Gammaproteobacteria				Spain	(Beaz-Hidalgo, Doce, et al. 2010)
Vibrio toranzoniae	Proteobacteria	Gammaproteobacteria				Spain	(Lasa et al. 2013)
Marinivirga aestuarii	Bacteroidetes	Flavobacteria				South Korea	(Park et al. 2013)
Vibrio tubiashii subsp. *europaeus*	Proteobacteria	Gammaproteobacteria			Increase of mortality in the initial stages of development	Spain	(Prado et al. 2015)

	Perkinsus olsenii	Myzozoa	Perkinsea	0 to 95.8	23-120 (7 sites)		China	(Wu et al. 2011)
	Perkinsus spp.	Myzozoa	Perkinsea	0 to 100	30 per sampling (monthly samples > 1 year)	Reduced growth rates	France	(Dang et al. 2013)
	Perkinsus olsenii	Myzozoa	Perkinsea			Clams emerging at the surface	South Korea	(Nam et al. 2018)
	Vibrio tapetis	Proteobacteria	Gammaproteobacteria			Reduced concentration of granulocytes, reduced haemocytes viability		(Paul-Pont, de Montaudouin, et al. 2010)
Scrobicularia plana[1]								
Spisula subtruncata[1]								
Tagelus plebeius	*Perkinsus chesapeaki*	Myzozoa	Perkinsea	0 to 91	22-30 (11 sites)		United States	(Reece et al. 2008)
Terebralia palustris								
Theora lata								
Tritia (Cyclope) neritea								
Tritia (Ilyanassa) obsoleta								
Turritella communis								
Yoldia hyperborea								
Yoldia limatula								
SUPUNCULA								
Sipunculus (Sipunculus) nudus[1]								

[1] Bioturbating species of economic interest (wild-caught or farmed).

Bibliography

Abdel-Baki A-AS, Al-Quraishy S, Dkhil MA, Al Nasr I, Oliveira E, Casal G, Azevedo C (2012) Ultrastructural characteristics of *Nematopsis* sp. oocysts (Apicomplexa: Porosporidae), a parasite of the clam *Meretrix meretrix* (Veneridae) from the Arabian Gulf, Saudi Arabia. Folia Parasitol (Praha) 59:81–86

Abed-Navandi D, Koller H, Dworschak PC (2005) Nutritional ecology of thalassinidean shrimps constructing burrows with debris chambers: The distribution and use of macronutrients and micronutrients. Mar Biol Res 1:202–215

Addino M, Lomovasky BJ, Cremonte F, Iribarne O (2010) Infection by gymnophallid metacercariae enhances predation mortality of SW Atlantic stout razor clam *Tagelus plebeius*. J Sea Res 63:102–107

Alda P, La Sala L, Marcotegui P, Martorelli SR (2011) Parasites and epibionts of grapsid crabs in Bahía Blanca estuary, Argentina. Crustaceana 84:559–571

Allam B, Paillard C, Ford S (2002) Pathogenicity of *Vibrio tapetis*, the etiological agent of brown ring disease in clams. Dis Aquat Organ 48:221–231

Allen MJ (1952) An example of parasitism among Polychaetes. Nature 169:197

Alvarez M, Addino M, Iribarne O, Botto F (2015) Combined engineering effects of clams and crabs on infaunal assemblages and food availability in intertidal systems. Mar Ecol Prog Ser 540:57–71

Andersen TJ, Jensen KT, Lund-Hansen L, Mouritsen KN, Pejrup M (2002) Enhanced erodibility of fine-grained marine sediments by *Hydrobia ulvae*. J Sea Res 48:51–58

Araújo JMC, Otero XL, Marques AGB, Nóbrega GN, Silva JRF, Ferreira TO (2012) Selective geochemistry of iron in mangrove soils in a semiarid tropical climate: effects of the burrowing activity of the crabs *Ucides cordatus* and *Uca maracoani*. Geo-Mar Lett 32:289–300

Arzul I, Chollet B, Michel J, Robert M, Garcia C, Joly J-P, François C, Miossec L (2012) One *Perkinsus* species may hide another: characterization of *Perkinsus* species present in clam production areas of France. Parasitology 139:1757–1771

Arzul I, Renault T, Lipart C, Davison A (2001) Evidence for interspecies transmission of oyster herpesvirus in marine bivalves. J Gen Virol 82:865–870

Aschenbroich A, Michaud E, Stieglitz T, Fromard F, Gardel A, Tavares M, Thouzeau G (2016) Brachyuran crab community structure and associated sediment reworking activities in pioneer and young mangroves of French Guiana, South America. Estuar Coast Shelf Sci 182:60–71

Astall CM, Taylor AC, Atkinson RJA (1996) Notes on some branchial isopods parasitic on Upogebiid mud-shrimps (Decapoda: Thalassinidea). J Mar Biol Assoc U K 76:821

Atkinson CA, Jolley DF, Simpson SL (2007) Effect of overlying water pH, dissolved oxygen, salinity and sediment disturbances on metal release and sequestration from metal contaminated marine sediments. Chemosphere 69:1428–1437

Azevedo C (1989a) Ultrastructural observations of *Cryptosporidium* sp. parasite of *Ruditapes decussatus* (Mollusca, Bivalvia). J Invertebr Pathol 54:23–27

Azevedo C (1989b) Fine structure of *Perkinsus atlanticus* n. sp. (Apicomplexa, Perkinsea) parasite of the clam *Ruditapes decussatus* from Portugal. J Parasitol 75:627–635

Azevedo C, Conchas RF, Montes J (2003) Description of *Haplosporidium edule* n. sp. (Phylum Haplosporidia), a parasite of *Cerastoderma edule* (Mollusca, Bivalvia) with complex spore ornamentation. Eur J Protistol 39:161–167

Bachelet G, Simon-Bouhet B, Desclaux C, Garcia-Meunier P, Mairesse G, Montaudouin X de, Raigné H, Randriambao K, Sauriau P, Viard F (2004) Invasion of the eastern Bay of Biscay by the nassariid gastropod *Cyclope neritea*: origin and effects on resident fauna. Mar Ecol Prog Ser 276:147–159

Banks JL, Ross DJ, Keough MJ, Macleod CK, Keane J, Eyre BD (2013) Influence of a burrowing, metal-tolerant polychaete on benthic metabolism, denitrification and nitrogen regeneration in contaminated estuarine sediments. Mar Pollut Bull 68:30–37

Bartoli P (1972) Les cycles biologiques de *Gymnophallus nereicola* J. Rebecq et G. Prévot, 1962 et *G. fossarum* P. Bartoli, 1965, espèces jumelles parasites d'Oiseaux de rivages marins (Trematoda, Digenea, Gymnophallidae). Ann Parasitol Hum Comparée 47:193–223

Bartoli P (1981) Ségrégation biologique et écologique de deux espèces jumelles sympatriques de Trématodes (Trematoda, Gymnophallidae). Z Für Parasitenkd Parasitol Res 65:167–180

Bartoli P (1983) *Gymnophallus Rebecqui* n .sp. (syn. *Parvatrema* sp. 1, J. Rebecq, 1964) (Digenea : Gymnophallidae) parasite intestinal d'Anatidés de Camargue (France). Ann Parasitol Hum Comparée 58:211–225

Bartoli M, Longhi D, Nizzoli D, Como S, Magni P, Viaroli P (2009) Short term effects of hypoxia and bioturbation on solute fluxes, denitrification and buffering capacity in a shallow dystrophic pond. J Exp Mar Biol Ecol 381:105–113

Bateman K, White P, Longshaw M (2012) Virus-like particles associated with mortalities of the Manila clam *Ruditapes philippinarum* in England. Dis Aquat Organ 99:163–167

Beaz Hidalgo R, Cleenwerck I, Balboa S, Prado S, De Vos P, Romalde JL (2009) *Vibrio breoganii* sp. nov., a non-motile, alginolytic, marine bacterium within the *Vibrio halioticoli* clade. Int J Syst Evol Microbiol 59:1589–1594

Beaz-Hidalgo R, Diéguez AL, Cleenwerck I, Balboa S, Doce A, Vos P de, Romalde JL (2010) *Vibrio celticus* sp. nov., a new *Vibrio* species belonging to the Splendidus clade with pathogenic potential for clams. Syst Appl Microbiol 33:311–315

Beaz-Hidalgo R, Doce A, Balboa S, Barja JL, Romalde JL (2010) *Aliivibrio finisterrensis* sp. nov., isolated from Manila clam, *Ruditapes philippinarum* and emended description of the genus Aliivibrio. Int J Syst Evol Microbiol 60:223–228

Beaz-Hidalgo R, Doce A, Pascual J, Toranzo AE, Romalde JL (2009) *Vibrio gallaecicus* sp. nov. isolated from cultured clams in north-western Spain. Syst Appl Microbiol 32:111–117

Bender K, Davis WR (1984) The effect of feeding by *Yoldia limatula* on bioturbation. 23:91–100

Benesh DP, Aura R-L, Andersin A-B, Tellervo Valtonen E (2015) The occurrence of *Echinorhynchus salmonis* Muller, 1784 in benthic amphipods in the Baltic Sea. Folia Parasitol (Praha) 62

Berkenbusch K, Rowden AA (1999) Factors influencing sediment turnover by the burrowing ghost shrimp *Callianassa filholi* (Decapoda: Thalassinidea). J Exp Mar Biol Ecol 238:283–292

Berrilli F, Ceschia G, De Liberato C, Di Cave D, Orecchia P (2000) Parasitic infections of *Chamelea gallina* (Mollusca, Bivalvia) from commercially exploited banks of the Adriatic Sea. Bull Eur Assoc Fish Pathol 20:199–205

Bertics VJ, Ziebis W (2009) Biodiversity of benthic microbial communities in bioturbated coastal sediments is controlled by geochemical microniches. ISME J 3:1269–1285

Bird FL, Boon PI, Nichols PD (2000) Physicochemical and microbial properties of burrows of the deposit-feeding Thalassinidean ghost shrimp *Biffarius arenosus* (Decapoda: Callianassidae). Estuar Coast Shelf Sci 51:279–291

Blakeslee AMH, Altman I, Miller AW, Byers JE, Hamer CE, Ruiz GM (2012) Parasites and invasions: a biogeographic examination of parasites and hosts in native and introduced ranges: Invasion history influences parasite biogeographic patterns. J Biogeogr 39:609–622

Bolam SG, Fernandes TF (2003) Dense aggregations of *Pygospio elegans* (Claparède): effect on macrofaunal community structure and sediments. J Sea Res 49:171–185

Born-Torrijos A, Kostadinova A, Raga JA, Holzer AS (2012) Molecular and morphological identification of larval opecoelids (Digenea: Opecoelidae) parasitising prosobranch snails in a Western Mediterranean lagoon. Parasitol Int 61:450–460

Botto F, Iribarne O (2000) Contrasting effects of two burrowing crabs (*Chasmagnathus granulata* and *Uca uruguayensis*) on sediment composition and transport in estuarine environments. Estuar Coast Shelf Sci 51:141–151

Boyer S, Chollet B, Bonnet D, Arzul I (2013) New evidence for the involvement of *Paracartia grani* (Copepoda, Calanoida) in the life cycle of *Marteilia refringens* (Paramyxea). Int J Parasitol 43:1089–1099

Braeckman U, Provoost P, Gribsholt B, Van Gansbeke D, Middelburg J, Soetaert K, Vincx M, Vanaverbeke J (2010) Role of macrofauna functional traits and density in biogeochemical fluxes and bioturbation. Mar Ecol Prog Ser 399:173–186

Branch GM, Pringle A (1987) The impact of the sand prawn *Callianassa kraussi* Stebbing on sediment turnover and on bacteria, meiofauna, and benthic microflora. J Exp Mar Biol Ecol 107:219–235

Bresciani J, Lützen J (1974) *Melinnacheres ergasiloides* M. Sars, a parasitic copepod of the polychaete *Melinna cristata*, with notes on multiple infections caused by annelidicolous copepods. Ophelia 13:31–41

Brustolin MC, Thomas MC, Mafra LL, Cunha Lana P da (2016) Bioturbation by the sand dollar *Encope emarginata* (Echinoidea, Mellitidae) changes the composition and size structure of microphytobenthic assemblages. Hydrobiologia 779:183–192

Bulcao C, Hodgson A (2012) Activity and feeding of *Dotilla fenestrata* (Brachyura: Ocypodidae) in a warm, temperate South African estuary. Afr J Aquat Sci 37:333–338

Burreson EM, Reece KS, Dungan CF (2005) Molecular, morphological, and experimental evidence support the synonymy of *Perkinsus chesapeaki* and *Perkinsus andrewsi*. J Eukaryot Microbiol 52:258–270

Campbell BR, Lindsay SM (2014) Effects of injury and nutrition on sediment reworking by *Clymenella torquata* (Annelida: Polychaeta). J Mar Res 72:307–329

Caradec S, Grossi V, Hulth S, Stora G, Gilbert F (2004) Macrofaunal reworking activities and hydrocarbon redistribution in an experimental sediment system. J Sea Res 52:199–210

Carballal MJ, Iglesias D, Santamarina J, Ferro-Soto B, Villalba A (2001) Parasites and pathologic conditions of the cockle *Cerastoderma edule* populations of the coast of Galicia (NW Spain). J Invertebr Pathol 78:87–97

Carrasco N, Rojas M, Aceituno P, Andree KB, Lacuesta B, Furones MD (2014) *Perkinsus chesapeaki* observed in a new host, the European common edible cockle *Cerastoderma edule*, in the Spanish Mediterranean coast. J Invertebr Pathol 117:56–60

Casado-Coy N, Martínez-García E, Sánchez-Jerez P, Sanz-Lázaro C (2017) Mollusc-shell debris can mitigate the deleterious effects of organic pollution on marine sediments (J Rohr, Ed.). J Appl Ecol 54:547–556

Casas SM, Villalba A (2012) Study of perkinsosis in the grooved carpet shell clam *Ruditapes decussatus* in Galicia (NW Spain). III. The effects of *Perkinsus olseni* infection on clam reproduction. Aquaculture 356–357:40–47

Cavalli LS, Batista CR, Nornberg BFS, Mayer FQ, Seixas FK, Romano LA, Marins LF, Abreu PC (2013) Natural occurrence of White spot syndrome virus and Infectious hypodermal and hematopoietic necrosis virus in *Neohelice granulata* crab. J Invertebr Pathol 114:86–88

Chandler GT, Schlekat CE, Garman ER, He L, Washburn KM, Stewart ER, Ferry JL (2014) Sediment nickel bioavailability and toxicity to estuarine crustaceans of contrasting bioturbative behaviors – an evaluation of the SEM-AVS paradigm. Environ Sci Technol 48:12893–12901

Ching HL (1989) *Profilicollis botulus* (Van Cleave, 1916) from diving ducks and shore crabs of British Columbia. J Parasitol 75:33

Chodkowski N, Williams JD, Burke RL (2016) Field surveys and experimental transmission of *Pleurogonius malaclemys* (Digenea: Pronocephalidae), an intestinal parasite of the diamondback terrapin *Malaclemys terrapin*. J Parasitol 102:410–418

Comtet T, Garcia C, Le Coguic Y, Joly J (2003) Infection of the cockle *Cerastoderma edule* in the Baie des Veys (France) by the microsporidian parasite *Steinhausia* sp. Dis Aquat Organ 57:135–139

Cooper KR, Brown RS, Chang PW (1982) The course and mortality of a hematopoietic neoplasm in the soft-shell clam, *Mya arenaria*. J Invertebr Pathol 39:149–157

Coulon P, Jangoux M (1993) Feeding rate and sediment reworking by the holothuroid *Holothuria tubulosa* (Echinodermata) in a Mediterranean seagrass bed off Ischia Island, Italy. Mar Ecol Prog Ser 92:201–204

Dahlgren CP, Posey MH, Hulbert AW (1999) The effects of bioturbation on the infaunal community adjacent to an offshore hardbottom reef. Bull Mar Sci 64:21–34

Dairain A, Gonzalez P, Legeay A, Maire O, Daffe G, Pascal L, Montaudouin X de (2017) Parasite interactions in the bioturbator *Upogebia pusilla* (Decapoda: Gebiidae): a case of amensalism? Mar Biol 164

Damsgaard JT, Mouritsen KN, Jensen KT (2005) Surface activity of *Corophium volutator*: A role for parasites? J Sea Res 54:176–184

D'Andrea AF, DeWitt TH (2009) Geochemical ecosystem engineering by the mud shrimp *Upogebia pugettensis* (Crustacea: Thalassinidae) in Yaquina Bay, Oregon: Density-dependent effects on organic matter remineralization and nutrient cycling. Limnol Oceanogr 54:1911–1932

Dang C, Montaudouin X de, Bald J, Jude F, Raymond N, Lanceleur L, Paul-Pont I, Caill-Milly N (2009) Testing the enemy release hypothesis: trematode parasites in the non-indigenous Manila clam *Ruditapes philippinarum*. Hydrobiologia 630:139–148

Dang C, Montaudouin X de, Binias C, Salvo F, Caill-Milly N, Bald J, Soudant P (2013) Correlation between perkinsosis and growth in clams *Ruditapes* spp. Dis Aquat Organ 106:255–265

Dang C, Montaudouin X de, Gonzalez P, Mesmer-Dudons N, Caill-Milly N (2008) Brown muscle disease (BMD), an emergent pathology affecting Manila clam *Ruditapes philippinarum* in Arcachon Bay (SW France). Dis Aquat Organ 80:219–228

Darriba S, Iglesias D, Ruiz M, Rodriguez R, López C (2010) Histological survey of symbionts and other conditions in razor clam *Ensis arcuatus* (Jeffreys, 1865) (Pharidae) of the coast of Galicia (NW Spain). J Invertebr Pathol 104:23–30

Das S, Tseng L-C, Wang L, Hwang J-S (2017) Burrow characteristics of the mud shrimp *Austinogebia edulis*, an ecological engineer causing sediment modification of a tidal flat (W-X Yang, Ed.). PLOS ONE 12:e0187647

Davidson T, Rivera C de (2010) Accelerated erosion of saltmarshes infested by the non-native burrowing crustacean *Sphaeroma quoianum*. Mar Ecol Prog Ser 419:129–136

Davis WR (1993) The role of bioturbation in sediment resuspension and its interaction with physical shearing. J Exp Mar Biol Ecol 171:187–200

De Ridder C, Jangoux M (1984) Intracoelomic parasitic Sporozoa in the burrowing spatangoid echinoid *Echinocardium cordatum*: coelomocyte reaction and formation of brown bodies. Helgoländer Meeresunters 37:225–231

Deblock S (1978) Distribution géographique des cercaires parasites des Mollusques du genre *Hydrobia* Hartman des côtes de France. Ann Parasitol Hum Comparée 53:577–593

Delefosse M, Kristensen E, Crunelle D, Braad PE, Dam JH, Thisgaard H, Thomassen A, Høilund-Carlsen PF (2015) Seeing the unseen—Bioturbation in 4D: tracing bioirrigation in marine sediment using positron emission tomography and computed tomography (K Herholz, Ed.). PLOS ONE 10:e0122201

Deng H, He C, Zhou Z, Liu C, Tan K, Wang N, Jiang B, Gao X, Liu W (2009) Isolation and pathogenicity of pathogens from skin ulceration disease and viscera ejection syndrome of the sea cucumber *Apostichopus japonicus*. Aquaculture 287:18–27

Desclaux C, Montaudouin X de, Bachelet G (2002) Cockle emergence at the sediment surface: "favourization" mechanism by digenean parasites? Dis Aquat Organ 52:137–149

Devauchelle G, Durchon M (1973) Sur la présence d'un virus, du type Iridovirus, dans les cellules mâles de *Nereis diversicolor* (O.F. Muller). Comptes Rendus Académie Sci - Ser III - Sci Vie 277:463–466

Dhrif E, Antar R, Abidli S, Gargouri L (2015) Digenean larvae parasitizing *Ruditapes decussatus* (Bivalvia) from Tunisianan coasts. Helminthologia 52

Dieguez AL, Beaz-Hidalgo R, Cleenwerck I, Balboa S, Vos P de, Romalde JL (2011) *Vibrio atlanticus* sp. nov. and *Vibrio artabrorum* sp. nov., isolated from the clams *Ruditapes philippinarum* and *Ruditapes decussatus*. Int J Syst Evol Microbiol 61:2406–2411

Ding Z, Pan J, Huang H, Jiang G, Chen J, Zhu X, Wang R, Xu G (2018) An integrated metabolic consequence of *Hepatospora eriocheir* infection in the Chinese mitten crab *Eriocheir sinensis*. Fish Shellfish Immunol 72:443–451

Ding Z, Yao Y, Zhang F, Wan J, Sun M, Liu H, Zhou G, Tang J, Pan J, Xue H, Zhao Z (2015) The first detection of white spot syndrome virus in naturally infected cultured Chinese mitten crabs, *Eriocheir sinensis* in China. J Virol Methods 220:49–54

Douglass TG, Jones I (1991) Parasites of California spionid polychaetes. Bull Mar Sci 48:308–317

Drake P, Marco-Herrero E, Subida M, Arias A, Cuesta J (2014) Host use pattern of the pea crab *Afropinnotheres monodi*: potential effects on its reproductive success and geographical expansion. Mar Ecol Prog Ser 498:203–215

Dubert J, Aranda-Burgos JA, Ojea J, Barja JL, Prado S (2017) Mortality event involving larvae of the carpet shell clam *Ruditapes decussatus* in a hatchery: isolation of the pathogen *Vibrio tubiashii* subsp. *europaeus*. J Fish Dis 40:1185–1193

Dubert J, Balboa S, Regueira M, González-Castillo A, Gómez-Gil B, Romalde JL (2016) *Vibrio barjaei* sp. nov., a new species of the Mediterranei clade isolated in a shellfish hatchery. Syst Appl Microbiol 39:553–556

Dubert J, Romalde JL, Prado S, Barja JL (2016) *Vibrio bivalvicida* sp. nov., a novel larval pathogen for bivalve molluscs reared in a hatchery. Syst Appl Microbiol 39:8–13

Dufour SC, White C, Desrosiers G, Juniper SK (2008) Structure and composition of the consolidated mud tube of *Maldane sarsi* (Polychaeta: Maldanidae). Estuar Coast Shelf Sci 78:360–368

Dungan CF, Reece KS (2006) *In vitro* propagation of two *Perkinsus* spp. parasites from Japanese Manila clams *Venerupis philippinarum* and description of *Perkinsus honshuensis* n. sp. J Eukaryot Microbiol 53:316–326

Dunn RJK, Welsh DT, Jordan MA, Teasdale PR, Lemckert CJ (2009) Influence of natural amphipod (*Victoriopisa australiensis*) (Chilton, 1923) population densities on benthic metabolism, nutrient fluxes, denitrification and DNRA in sub-tropical estuarine sediment. Hydrobiologia 628:95–109

Dworschak PC (1988) The Biology of *Upogebia pusilla* (PETAGNA) (Decapoda, Thalassinidea) III. Growth and Production. Mar Ecol 9:51–77

Dworschak PC (2006) A new species of *Eucalliaw* Manning & Felder, 1991 (Decapoda: Callianassidae) from the Philippines. Raffles Bull Zool 54:349–359

Eigemann F, Burmeister A, Skovgaard A (2010) *Hematodinium* sp. (Alveolata, Syndinea) detected in marine decapod crustaceans from waters of Denmark and Greenland. Dis Aquat Organ 92:59–68

El Bour M, Dellali M, Boukef I, Lakhal F, Mraouna R, El Hili HA, Paillard C, Klena J (2012) First assessment of Perkinsosis and brown ring disease co-infection in *Ruditapes decussatus* in the North Lake of Tunis (southern Mediterranean Sea). J Mar Biol Assoc U K 92:1579–1584

El Bour M, Dellali M, Boukef I, Lakhal F, Mraouna R, Hili HAE, Paillard C, Klena J (2011) Occurrence of Brown Ring Disease in carpet shell clams *Ruditapes decussatus* from the Gulf of Gabes (Tunisia, central Mediterranean Sea). J Shellfish Res 30:797–804

Elandaloussi LM, Carrasco N, Roque A, Andree K, Dolores Furones M (2009) First record of *Perkinsus olseni*, a protozoan parasite infecting the commercial clam *Ruditapes decussatus* in Spanish Mediterranean waters. J Invertebr Pathol 100:50–53

Fermer J, Culloty SC, Kelly TC, O'Riordan RM (2010) Temporal variation of *Meiogymnophallus minutus* infections in the first and second intermediate host. J Helminthol 84:362–368

Fermer J, Culloty SC, Kelly TC, O'Riordan RM (2011) Parasitological survey of the edible cockle *Cerastoderma edule* (Bivalvia) on the south coast of Ireland. J Mar Biol Assoc U K 91:923–928

Figueiredo-Barros MP, Caliman A, Leal JJF, Bozelli RL, Farjalla VF, Esteves FA (2009) Benthic bioturbator enhances CH_4 fluxes among aquatic compartments and atmosphere in experimental microcosms (GA Weyhenmeyer, Ed.). Can J Fish Aquat Sci 66:1649–1657

Figueras A, Robledo JAF, Novoa B (1996) Brown Ring Disease in clams (*Ruditapes decussatus* and *R. philippinarum*) from Spain and Portugal. J Shellfish Res 15:363–368

Flye-Sainte-Marie J, Pouvreau S, Paillard C, Jean F (2007) Impact of Brown Ring Disease on the energy budget of the Manila clam *Ruditapes philippinarum*. J Exp Mar Biol Ecol 349:378–389

Franco ME, Felgenhauer BE, Klerks PL (2018) Crude oil toxicity to fiddler crabs (*Uca longisignalis* and *Uca panacea*) from the northern Gulf of Mexico: Impacts on bioturbation, oxidative stress, and histology of the hepatopancreas: Crude oil toxicity to fiddler crabs. Environ Toxicol Chem 37:491–500

François F, Dalègre K, Gilbert F, Stora G (1999) Variabilité spécifique à l'intérieur des groupes fonctionnels. Étude du remaniement sédimentaire de deux bivalves Veneridae, *Ruditapes decussatus* et *Venerupis aurea*. Comptes Rendus Académie Sci - Ser III - Sci Vie 322:339–345

Freitas R, Martins R, Campino B, Figueira E, Soares AMVM, Montaudouin X (2014) Trematode communities in cockles (*Cerastoderma edule*) of the Ria de Aveiro (Portugal): Influence of inorganic contamination. Mar Pollut Bull 82:117–126

Furukawa Y, Bentley SJ, Lavoie DL (2001) Bioirrigation modeling in experimental benthic mesocosms. J Mar Res 59:417–452

Gagnon J-M, Beaudin L, Silverberg N, Mauviel A (2013) Mesocosm and *in situ* observations of the burrowing shrimp *Calocaris templemani* (Decapoda: Thalassinidea) and its bioturbation activities in soft sediments of the Laurentian Trough. Mar Biol 160:2687–2697

Gam M, Bazaïri H, Jensen KT, Montaudouin X de (2008) Metazoan parasites in an intermediate host population near its southern border: the common cockle (*Cerastoderma edule*) and its trematodes in a Moroccan coastal lagoon (Merja Zerga). J Mar Biol Assoc U K 88

Gam M, Montaudouin X de, Bazairi H (2009) Do trematode parasites affect cockle (*Cerastoderma edule*) secondary production and elimination? J Mar Biol Assoc U K 89:1395

Gantsevich MM, Strelkov PP, Basova LA, Malakhov VV (2016) Parasitizing of trematodes provokes warts on the hinge plate of the bivalve mollusk *Macoma balthica* Linnaeus, 1758 (Veneroida, Tellinidae). Dokl Biol Sci 466:8–11

Gdoura M, Sellami H, Nasfi H, Trabelsi R, Mansour S, Attia T, Nsaibia S, Vallaeys T, Gdoura R, Siala M (2016) Molecular detection of the three major pathogenic *Vibrio* species from seafood products and sediments in Tunisia using Real-Time PCR. J Food Prot 79:2086–2094

Giangrande A, Licciano M, Fanelli G (2001) Bioturbation behaviour in two Mediterranean polychaetes. J Mar Biol Assoc U K 81:341–342

Goedknegt MA, Schuster A-K, Buschbaum C, Gergs R, Jung AS, Luttikhuizen PC, Meer J van der, Troost K, Wegner KM, Thieltges DW (2017) Spillover but no spillback of two invasive parasitic copepods from invasive Pacific oysters (*Crassostrea gigas*) to native bivalve hosts. Biol Invasions 19:365–379

Goerlitz S, Berkenbusch K, Probert PK (2015) Lugworm (*Abarenicola affinis*) in seagrass and unvegetated habitats. Helgol Mar Res 69:159–168

Gomez-Leon J, Villamil L, Lemos ML, Novoa B, Figueras A (2005) Isolation of *Vibrio alginolyticus* and *Vibrio splendidus* from aquacultured carpet shell clam (*Ruditapes decussatus*) larvae associated with mass mortalities. Appl Environ Microbiol 71:98–104

Griffen B (2009) Effects of a newly invasive parasite on the burrowing mud shrimp, a widespread ecosystem engineer. Mar Ecol Prog Ser 391:73–83

Hallett SL, Erséus C, Lester RJG (1999) Actinosporeans (Myxozoa) from marine oligochaetes of the Great Barrier Reef. Syst Parasitol 44:51–59

Hamaguchi M, Suzuki N, Usuki H, Ishioka H (1998) Perkinsus protozoaninfecton in short-necked tlam *Tapes* (=*Ruditapes*) *philippinarum* in Japan. Fish Pathol 33:473–480

Han E-T, Park J-H, Chai J-Y (2012) *Cercaria caribbea* LVIII Cable, 1963 (Digenea: Cyathocotylidae) in the Republic of Korea and its surface ultrastructure. Korean J Parasitol 50:177–180

Han E-T, Whang J-D, Chai J-Y (2009) *Himasthla alincia* (Echinostomatidae): Metacercariae in brackish water bivalves and their Growth and development in experimental animals. J Parasitol 95:1415–1420

Ho J, Kim I-H (1995) Copepod parasites of a commercial clam (*Meretrix meretrix*) from Phuket, Thailand. Hydrobiologia 308:13–21

Holmer M, Heilskov AC (2008) Distribution and bioturbation effects of the tropical alpheid shrimp *Alpheus macellarius* in sediments impacted by milkfish farming. Estuar Coast Shelf Sci 76:657–667

Howe RL, Rees AP, Widdicombe S (2004) The impact of two species of bioturbating shrimp (*Callianassa subterranea* and *Upogebia deltaura*) on sediment denitrification. J Mar Biol Assoc UK 84:629–632

Hughes DJ, Ansell AD, Atkinson RJA (1996) Sediment bioturbation by the echiuran worm *Maxmuelleria lankesteri* (Herdman) and its consequences for radionuclide dispersal in Irish Sea sediments. J Exp Mar Biol Ecol 195:203–220

Huxham M, Raffaelli D, Pike AW (1995) The effect of larval trematodes on the growth and burrowing behaviour of *Hydrobia ulvae* (Gastropoda: Prosobranchiata) in the Ythan estuary, north-east Scotland. J Exp Mar Biol Ecol 185:1–17

Ito M, Ito K, Ohta K, Hano T, Onduka T, Mochida K, Fujii K (2016) Evaluation of bioremediation potential of three benthic annelids in organically polluted marine sediment. Chemosphere 163:392–399

Itoh N, Monoyama K, Ogawa K (2005) First report of three protozoan parasites (a haplosporidian, *Marteilia* sp. and *Marteilioides* sp.) from the Manila clam, *Venerupis* (=*Ruditapes*) *philippinarum* in Japan. J Invertebr Pathol 88:201–206

Itoh N, Yamamoto T, Kang H-S, Choi K-S, Green TJ, Carrasco N, Awaji M, Chow S (2014) A novel Paramyxean parasite, *Marteilia granula* sp. nov. (Cercozoa), from the digestive gland of Manila clam *Ruditapes philippinarum* in Japan. Fish Pathol 49:181–193

Ivanova EP, Nedashkovskaya OI, Chun J, Lysenko AM, Frolova GM, Svetashev VI, Vysotskii MV, Mikhailov VV, Huq A, Colwell RR (2001) *Arenibacter* gen. nov., new genus of the family Flavobacteriaceae and description of a new species, *Arenibacter latericius* sp. nov. Int J Syst Evol Microbiol 51:1987–1995

Jacobson T, Holmström K, Yang G, Ford AT, Berger U, Sundelin B (2010) Perfluorooctane sulfonate accumulation and parasite infestation in a field population of the amphipod *Monoporeia affinis* after microcosm exposure. Aquat Toxicol 98:99–106

Jensen T, Jensen KT, Mouritsen KN (1998) The influence of trematode *Microphallus claviformis* on two congeneric intermediate host species (*Corophium*): infection characteristics and host survival. J Exp Mar Biol Ecol 277:35–48

Johnston BR, Halton DW, Moore MN (1982) *Bucephaloides gracilescens*: A quantitative study of the lysosomal cellular stress response induced by the sporocysts and developing cercariae within the white furrow shell, *Abra alba*. Z Parasitenkd Parasitol Res 67:31–36

Jones SE, Jago CF (1993) *In situ* assessment of modification of sediment properties by burrowing invertebrates. Mar Biol 115:133–142

Jones AM, Jones YM, James JL (1979) The incidence of the nemertine *Malacobdella grossa* in the bivalve *Cerastoderma edule* in Shetland. J Mar Biol Assoc U K 59:373

Jonsson PR, Andé C (1992) Mass mortality of the bivalve *Cerastoderma edule* on the swedish west coast caused by infestation with the digenean trematode *Cercariae cerastodermae* I. Ophelia 36:151–157

Kamimura S, Tsuchiya M (2004) The effect of feeding behavior of the gastropods *Batillaria zonalis* and *Cerithideopsilla cingulata* on their ambient environment. Mar Biol 144:705–712

Kamimura S, Tsuchiya M (2006) Effects of opportunistic feeding by the intertidal gastropods *Batillaria zonalis* and *B. flectosiphonata* on material flux on a tidal flat. Mar Ecol Prog Ser 318:203–211

Kamp A, Witte U (2005) Processing of 13C-labelled phytoplankton in a fine-grained sandy-shelf sediment (North Sea): relative importance of different macrofauna species. Mar Ecol Prog Ser 297:61–70

Kanaya G (2014) Effects of infaunal bivalves on associated macrozoobenthic communities in estuarine soft-bottom habitats: A bivalve addition experiment in a brackish lagoon. J Exp Mar Biol Ecol 457:180–189

Kang J, Koo BJ, Jeong K-S, Woo HJ, Seo J, Seo H-S, Kim M-S, Kwon K (2018) Insights into macroinvertebrate burrowing activity and methane flux in tidal flats. J Coast Res 85:681–685

Karlson K (2007) Diurnal bioturbating activities of *Monoporeia affinis*: effects on benthic oxygen and nutrient fluxes. Mar Ecol Prog Ser 331:195–205

Katrak G, Bird FL (2003) Comparative effects of the large bioturbators, *Trypaea australiensis* and *Heloecius cordiformis*, on intertidal sediments of Western Port, Victoria, Australia. Mar Freshw Res 54:701–708

Kihara TC, Björnberg TKS, Kawauchi GY (2007) *Myzomolgus sipunculensis* sp. nov. (Cyclopoida, Catiniidae), a new copepod associated with sipunculan worms from Brazil. Rev Bras Zool 24:591–600

Kikuchi E (1987) Effects of the brackish deposit-feeding polychaetes *Notomastus* sp. (Capitellidae) and *Neanthes japonica* (Izuka) (Nereidae) on sedimentary O2 consumption and CO2 production rates. J Exp Mar Biol Ecol 114:15–25

Kinoshita K, Wada M, Kogure K, Furota T (2008) Microbial activity and accumulation of organic matter in the burrow of the mud shrimp, *Upogebia major* (Crustacea: Thalassinidea). Mar Biol 153:277–283

Klerks PL, Felder DL, Strasser K, Swarzenski PW (2007) Effects of ghost shrimp on zinc and cadmium in sediments from Tampa Bay, FL. Mar Chem 104:17–26

Kneer D, Asmus H, Jompa J (2013) Do burrowing callianassid shrimp control the lower boundary of tropical seagrass beds? J Exp Mar Biol Ecol 446:262–272

Koehler AV, Poulin R (2010) Host partitioning by parasites in an intertidal crustacean community. J Parasitol 96:862–868

Køie M (2000) First record of an actinosporean (Myxozoa) in a marine polychaete annelid. J Parasitol 86:871–872

Køie M (2001) The life cycle of *Dichelyne* (*Cucullanellus*) *minutus* (Nematoda: Cucullanidae). Folia Parasitol (Praha) 48:304–310

Koo BJ, Seo J (2017) Sediment reworking by a polychaete, *Perinereis aibuhitensis*, in the intertidal sediments of the Gomso Bay, Korea. Ocean Sci J 52:511–518

Kristensen E, Alongi DM (2006) Control by fiddler crabs (*Uca vocans*) and plant roots (*Avicennia marina*) on carbon, iron, and sulfur biogeochemistry in mangrove sediment. Limnol Oceanogr 51:1557–1571

Kristensen E, Penha-Lopes G, Delefosse M, Valdemarsen T, Quintana CO, Banta GT (2012) What is bioturbation? The need for a precise definition for fauna in aquatic sciences. Mar Ecol Prog Ser 446:285–302

Kudenov JD (1982) Rates of seasonal sediment reworking in *Axiothella rubrocincta* (Polychaeta: Maldanidae). Mar Biol 70:181–186

Kuris AM, Poinar GO, Hess RT (1980) Post-larval mortality of the endoparasitic isopod castrator *Portunion conformis* (Epicaridea: Entoniscidae) in the shore crab, *Hemigrapsus oregonensis*, with a description of the host response. Parasitology 80:211

Kuriyama R, Besse C, Gèze M, Omoto CK, Schrével J (2005) Dynamic organization of microtubules and microtubule-organizing centers during the sexual phase of a parasitic protozoan, *Lecudina tuzetae* (Gregarine, Apicomplexa). Cell Motil Cytoskeleton 62:195–209

La Sala LF, Perez AM, Martorelli SR (2012) Epidemiology of acanthocephalan infections in crabs from the Bahía Blanca Estuary, Argentina. J Helminthol 86:446–452

La Sala LF, Redondo LM, Díaz Carrasco JM, Pereyra AM, Farber M, Jost H, Fernández-Miyakawa ME (2015) Carriage of *Clostridium perfringens* by benthic crabs in a sewage-polluted estuary. Mar Pollut Bull 97:365–372

Landers SC (1991) *Pterospora demodendrion* sp.nov. and *Pterospora clymenellae*, acephaline eugregarines from coastal North Carolina. Eur J Protistol 27:55–59

Lasa A, Diéguez AL, Romalde JL (2013) *Vibrio toranzoniae* sp. nov., a new member of the Splendidus clade in the genus *Vibrio*. Syst Appl Microbiol 36:96–100

Lasa A, Diéguez AL, Romalde JL (2015) Description of *Lacinutrix venerupis* sp. nov.: A novel bacterium associated with reared clams. Syst Appl Microbiol 38:115–119

Lasa A, Pichon P, Diéguez AL, Romalde JL (2016) *Marinomonas gallaica* sp. nov. and *Marinomonas atlantica* sp. nov., isolated from reared clams (*Ruditapes decussatus*). Int J Syst Evol Microbiol 66:3183–3188

Lassalle G, Montaudouin X de, Soudant P, Paillard C (2007) Parasite co-infection of two sympatric bivalves, the Manila clam (*Ruditapes philippinarum*) and the cockle (*Cerastoderma edule*) along a latitudinal gradient. Aquat Living Resour 20:33–42

Leung TLF, Poulin R (2007) Interactions between parasites of the cockle *Austrovenus stutchburyi*: hitch-hikers, resident-cleaners, and habitat-facilitators. Parasitology 134:247

Leung TLF, Poulin R (2008) Size-dependent pattern of metacercariae accumulation in *Macomona liliana*: the threshold for infection in a dead-end host. Parasitol Res 104:177–180

Leung TLF, Poulin R, Keeney DB (2009) Accumulation of diverse parasite genotypes within the bivalve second intermediate host of the digenean *Gymnophallus* sp. Int J Parasitol 39:327–331

Lévesque B, Gagnon F, Valentin A, Cartier J-F, Chevalier P, Cardinal P, Cantin P, Gingras S (2006) Étude de la contamination microbienne des myes (*Mya arenaria*) de la rive nord de l'estuaire maritime du fleuve Saint-Laurent (Québec, Canada). Can J Microbiol 52:984–991

Li B, Keesing JK, Lourey M, McLaughlin J (2013) Feeding and bioturbation effects of the sand dollar *Peronella lesueiri* (L. Agassiz, 1841) (Echinodermata) on microphytobenthos and sediment fluxes. Mar Freshw Behav Physiol 46:431–446

Li H, Qiao G, Li Q, Zhou W, Won KM, Xu D-H, Park S-I (2010) Biological characteristics and pathogenicity of a highly pathogenic *Shewanella marisflavi* infecting sea cucumber, *Apostichopus japonicus*: Biological characteristics and pathogenicity of *S. marisflavi*. J Fish Dis 33:865–877

Li H, Yan Y, Yu X, Miao S, Wang Y (2011) Occurrence and effects of the rhizocephalan parasite, *Polyascus gregarius*, in the chinese mitten crab, *Eriocheir sinensis*, cultured in a freshwater pond, China. J World Aquac Soc 42:354–363

Li J, Zhu C, Guo Y, Xie X, Huang G, Chen S (2015) Experimental study of bioturbation by *Sipunculus nudus* in a polyculture system. Aquaculture 437:175–181

Lindqvist S, Engelbrektsson J, Eriksson SP, Hulth S (2016) Functional classification of bioturbating macrofauna in marine sediments using time-resolved imaging of particle displacement and multivariate analysis. Biogeosciences Discuss:1–30

Liu H, Zheng F, Sun X, Hong X, Dong S, Wang B, Tang X, Wang Y (2010) Identification of the pathogens associated with skin ulceration and peristome tumescence in cultured sea cucumbers *Apostichopus japonicus* (Selenka). J Invertebr Pathol 105:236–242

Lopez G, Elmgren R (1989) Feeding depths and organic absorption for the deposit feeding benthic amphipods *Pontoporera affinis* and *Pontoporeia femorata*: Pontoporeia feeding. Limnol Oceanogr 34:982–991

López-Flores I, Robles F, Valencia J, Grau A, Villalba A, Herrán R de la, Garrido-Ramos M, Ruiz-Rejón C, Ruiz-Rejón M, Navas J (2008) Detection of *Marteilia refringens* using nested PCR and *in situ* hybridisation in *Chamelea gallina* from the Balearic Islands (Spain). Dis Aquat Organ 82:79–87

MacTavish T, Stenton-Dozey J, Vopel K, Savage C (2012) Deposit-feeding sea cucumbers enhance mineralization and nutrient cycling in organically-enriched coastal sediments. PLOS ONE 7:e50031

Maillard C (1975) Cycle évolutif de *Paratimonia gobii*, Prévot et Bartoli 1967 (Trematoda-Monorchiidae). Acta Trop 32:327–339

Maire O, Duchêne JC, Amouroux JM, Grémare A (2007) Activity patterns in the terebellid polychaete *Eupolymnia nebulosa* assessed using a new image analysis system. Mar Biol 151:737–749

Marinelli RL (1992) Effects of polychaetes on silicate dynamics and fluxes in sediments: Importance of species, animal activity and polychaete effects on benthic diatoms. J Mar Res 50:745–779

Markham JC (2005) New species and records of Bopyridae (Crustacea: Isopoda) infesting species of the genus *Upogebia* (Crustacea: Decapoda: Upogebiidae): the genus *Progebiophilus* Codreanu & Codreanu, 1963; and remarks on *Phyllodurus* Stimpson, 1857. Proc Biol Soc Wash 117:186–198

Marques JS, Müller IC, Moser JR, Sincero TC, Marques MRF (2011) Wild captured crab, *Chasmagnathus granulata* (Dana, 1851), a new host for white spot syndrome virus (WSSV). Aquaculture 318:20–24

Marshall WL, Bower SM, Meyer GR (2003) A comparison of the parasite and symbiont fauna of cohabiting native (*Protothaca staminea*) and introduced (*Venerupis philippinarum* and *Nuttalia obscurata*) clams in British Columbia. J Shellfish Res 22:185–192

Martin D, Cuesta JA, Drake P, Gil J, Nygren A, Pleijel F (2012) The symbiotic hesionid *Parasyllidea humesi* Pettibone, 1961 (Annelida: Polychaeta) hosted by *Scrobicularia plana* (da Costa, 1778) (Mollusca: Bivalvia: Semelidade) in European waters. Org Divers Evol 12:145–153

Martinelli Filho JE, Santos RB dos, Ribeiro CC (2014) Host selection, host-use pattern and competition in *Dissodactylus crinitichelis* and *Clypeasterophilus stebbingi* (Brachyura: Pinnotheridae). Symbiosis 63:99–110

Martinetto P, Palomo G, Bruschettin M, Iribarne O (2011) Similar effects on sediment structure and infaunal community of two competitive intertidal soft-bottom burrowing crab species. J Mar Biol Assoc U K 91:1385–1393

Martorelli SR, Marcotegui P, Montes M, Panei CJ (2017) Screening for WSSV in crustacean from marine areas of Buenos Aires, Argentina. Rev Biol Mar Oceanogr 52:635–639

Martorelli SR, Overstreet RM, Jovonovich JA (2010) First report of viral pathogens WSSV and IHHNV in Argentine crustaceans. Bull Mar Sci 86:117–131

Massé C (2014) Effets de la bioturbation sur la diversité des communautés bactériennes du sédiment : approches expérimentale et *in-situ* : de *Melinna palmata* aux communautés de la vasière Ouest-Gironde. phdthesis, Université de Bordeaux, Bordeaux, France

Mautner SI, Cook KA, Forbes MR, McCurdy DG, Dunn AM (2007) Evidence for sex ratio distortion by a new microsporidian parasite of a Corophiid amphipod. Parasitology 134:1567–1573

Mayer M, Schaffner L, Kemp W (1995) Nitrification potentials of benthic macrofaunal tubes and burrow walls:effects of sediment NH4+ and animal irrigation behavior. Mar Ecol Prog Ser 121:157–169

McCurdy DG (1999) Evidence that the parasitic nematode *Skrjabinoclava* manipulates host *Corophium* behavior to increase transmission to the sandpiper, *Calidris pusilla*. Behav Ecol 10:351–357

McCurdy DG (2001) Asexual reproduction in *Pygospio elegans* Claparède (Annelida, Polychaeta) in relation to parasitism by *Lepocreadium setiferoides* (Miller and Northup) (Platyhelminthes, Trematoda). Biol Bull 201:45–51

McCurdy DG, Moran B (2004) Parasitism and soft-bottom community structure: studies in a polychaete-amphipod system. J Mar Biol Assoc U K 84:165–169

McDermott JJ (2011) Parasites of shore crabs in the genus *Hemigrapsus* (Decapoda: Brachyura: Varunidae) and their status in crabs geographically displaced: a review. J Nat Hist 45:2419–2441

Mchenga ISS, Tsuchiya M (2008) Nutrient dynamics in mangrove crab burrow sediments subjected to anthropogenic input. J Sea Res 59:103–113

McLaughlin SM, Faisal M (1998) Histopathological alterations associated with *Perkinsus* spp. infection in the softshell clam *Mya arenaria*. Parasite 5:263–271

Mechri B, Ben Salem I, Medhioub A, Medhioub MN, Aouni M (2015) Isolation and genotyping of potentially pathogenic *Vibrio alginolyticus* associated with *Ruditapes decussatus* larva and juvenile mass mortalities. Aquac Int 23:1033–1047

Meißner K, Bick A (1997) Population dynamics and ecoparasitological surveys of *Corophium volutator* in coastal waters in the Bay of Mecklenburg (southern Baltic Sea). Dis Aquat Organ 29:169–179

Mendez Casariego A, Merlo M, Etchegoin J (2015) Spatial variability of larval parasites harboured by two crab species in an estuarine environment in Argentina. J Mar Biol Assoc U K:1–5

Mermillod-Blondin F, François-Carcaillet F, Rosenberg R (2005) Biodiversity of benthic invertebrates and organic matter processing in shallow marine sediments: an experimental study. J Exp Mar Biol Ecol 315:187–209

Michaud E, Aller R C, Stora G (2010) Sedimentary organic matter distributions, burrowing activity, and biogeochemical cycling: Natural patterns and experimental artifacts. Estuar Coast Shelf Sci 90:21–34

Michaud E, Desrosiers G, Mermillod-Blondin F, Sundby B, Stora G (2006) The functional group approach to bioturbation: II. The effects of the *Macoma balthica* community on fluxes of nutrients and dissolved organic carbon across the sediment–water interface. J Exp Mar Biol Ecol 337:178–189

Michio K, Kengo K, Yasunori K, Hitoshi M, Takayuki Y, Hideaki Y, Hiroshi S (2003) Effects of deposit feeder *Stichopus japonicus* on algal bloom and organic matter contents of bottom sediments of the enclosed sea. Mar Pollut Bull 47:118–125

Mokhtari M, Abd Ghaffar M, Usup G, Che Cob Z (2016) Effects of fiddler crab burrows on sediment properties in the mangrove mudflats of Sungai Sepang, Malaysia. Biology 5:7

Montaudouin X de, Blanchet H, Kisielewski I, Desclaux C, Bachelet G (2003) Digenean trematodes moderately alter *Hydrobia ulvae* population size structure. J Mar Biol Assoc U K 83:297–305

Montaudouin X de, Kisielewski I, Bachelet G, Desclaux C (2000) A census of macroparasites in an intertidal bivalve community, Arcachon Bay, France. Oceanol Acta 23:453–468

Morgan E, O'Riordan R, Kelly T, Culloty S (2012) Influence of disseminated neoplasia, trematode infections and gametogenesis on surfacing and mortality in the cockle *Cerastoderma edule*. Dis Aquat Organ 98:73–84

Mouritsen KN (2002) The parasite-induced surfacing behaviour in the cockle *Austrovenus stutchburyi*: a test of an alternative hypothesis and identification of potential mechanisms. Parasitology 124:521–528

Mouritsen KN (2004) Intertidal facilitation and indirect effects: causes and consequences of crawling in the New Zealand cockle. Mar Ecol Prog Ser 271:207–220

Mouritsen KN, Haun SCB (2008) Community regulation by herbivore parasitism and density: Trait-mediated indirect interactions in the intertidal. J Exp Mar Biol Ecol 367:236–246

Mouritsen KN, Jensen KT (1994) The enigma of gigantism: effect of larval trematodes on growth, fecundity, egestion and locomotion in *Hydrobia ulvae* (Pennant) (Gastropoda: Prosobranchia). J Exp Mar Biol Ecol 181:53–66

Mouritsen KN, Poulin R (2005) Parasites boosts biodiversity and changes animal community structure by trait-mediated indirect effects. Oikos 108:344–350

Murray F, Douglas A, Solan M (2014) Species that share traits do not necessarily form distinct and universally applicable functional effect groups. Mar Ecol Prog Ser 516:23–34

Murray F, Widdicombe S, McNeill C, Douglas A (2017) Assessing the consequences of environmental impacts: variation in species responses has unpredictable functional effects. Mar Ecol Prog Ser 583:35–47

Nam K-W, Jeung H-D, Song J-H, Park K-H, Choi K-S, Park K-I (2018) High parasite burden increases the surfacing and mortality of the Manila clam (*Ruditapes philippinarum*) in intertidal sandy mudflats on the west coast of Korea during hot summer. Parasit Vectors 11

Natálio LF, Pardo JCF, Machado GBO, Fortuna MD, Gallo DG, Costa TM (2017) Potential effect of fiddler crabs on organic matter distribution: A combined laboratory and field experimental approach. Estuar Coast Shelf Sci 184:158–165

Nates SF, Felder DL (1998) Impacts of burrowing ghost shrimp, genus *Lepidophthalmus* Crustacea: Decapoda: Thalassinidea, on penaeid shrimp culture. J World Aquac Soc 29:188–210

Navas JI, Castillo MC, Vera P, Ruiz-Rico M (1992) Principal parasites observed in clams, *Ruditapes decussatus* (L.), *Ruditapes philippinarum* (Adams et Reeve), *Venerupis pullastra* (Montagu) and *Venerupis aureus* (Gmelin), from the Huelva coast (S.W. Spain). Aquaculture 107:193–199

Nedashkovskaya OI (2004) *Salegentibacter holothuriorum* sp. nov., isolated from the edible holothurian *Apostichopus japonicus*. Int J Syst Evol Microbiol 54:1107–1110

Needham HR, Pilditch CA, Lohrer AM, Thrush SF (2013) Density and habitat dependent effects of crab burrows on sediment erodibility. J Sea Res 76:94–104

Ngo TTT, Choi K-S (2004) Seasonal changes of *Perkinsus* and *Cercaria infections* in the Manila clam *Ruditapes philippinarum* from Jeju, Korea. Aquaculture 239:57–68

Nicholaus R, Zheng Z (2014) The effects of bioturbation by the Venus clam *Cyclina sinensis* on the fluxes of nutrients across the sediment–water interface in aquaculture ponds. Aquac Int 22:913–924

Nichols FH, Cacchione DA, Drake DE, Thompson JK (1989) Emergence of burrowing urchins from California continental shelf sediments—A response to alongshore current reversals? Estuar Coast Shelf Sci 29:171–182

Noffke A, Hertweck G, Kröncke I, Wehrmann A (2009) Particle size selection and tube structure of the polychaete *Owenia fusiformis*. Estuar Coast Shelf Sci 81:160–168

Norling K, Rosenberg R, Hulth S, Grémare A, Bonsdorff E (2007) Importance of functional biodiversity and species-specific traits of benthic fauna for ecosystem functions in marine sediment. Mar Ecol Prog Ser 332:11–23

Novoa B, Balseiro P, Figueras A (2004) Molecular detection of a haplosporidian parasite in carpet shell clam *Ruditapes decussatus* from Spain. Dis Aquat Organ 61:89–93

O'Connell-Milne SA, Poulin R, Savage C, Rayment W (2016) Reduced growth, body condition and foot length of the bivalve *Austrovenus stutchburyi* in response to parasite infection. J Exp Mar Biol Ecol 474:23–28

Ólafsson E, Ndaro S (1997) Impact of the mangrove crabs *Uca annulipes* and *Dotilla fenestrata* on meiobenthos. Mar Ecol Prog Ser 158:225–231

Olsgard F, Schaanning MT, Widdicombe S, Kendall MA, Austen MC (2008) Effects of bottom trawling on ecosystem functioning. J Exp Mar Biol Ecol 366:123–133

Orvain F (2005) A model of sediment transport under the influence of surface bioturbation: generalisation to the facultative suspension-feeder *Scrobicularia plana*. Mar Ecol Prog Ser 286:43–56

Osovitz C, Julian D (2002) Burrow irrigation behavior of *Urechis caupo*, a filter-feeding marine invertebrate, in its natural habitat. Mar Ecol Prog Ser 245:149–155

Paari A, Jeon C-H, Choi H-S, Jung S-H, Kim J-H (2017) Molecular detection of *Kudoa septempunctata* (Myxozoa: Multivalvulida) in sea water and marine invertebrates. Fish Aquat Sci 20

Paillard C (2004) A short-review of brown ring disease, a vibriosis affecting clams, *Ruditapes philippinarum* and *Ruditapes decussatus*. Aquat Living Resour 17:467–475

Paillard C, Korsnes K, Le Chevalier P, Le Boulay C, Harkestad L, Eriksen A, Willassen E, Bergh Ø, Bovo C, Skår C, Mortensen S (2008) *Vibrio tapetis*-like strain isolated from introduced Manila clams *Ruditapes philippinarum* showing symptoms of brown ring disease in Norway. Dis Aquat Organ 81:153–161

Palomo G, Iribarne O (2000) Sediment bioturbation by polychaete feeding may promote sediment stability. Bull Mar Sci 67:249–257

Papaspyrou S, Gregersen T, Cox R, Thessalou-Legaki M, Kristensen E (2005) Sediment properties and bacterial community in burrows of the ghost shrimp *Pestarella tyrrhena* (Decapoda: Thalassinidea). Aquat Microb Ecol 38:181–190

Papaspyrou S, Thessalou-Legaki M, Kristensen E (2004) Impact of *Pestarella tyrrhena* on benthic metabolism in sediment microcosms enriched with seagrass and macroalgal detritus. Mar Ecol Prog Ser 281:165–179

Park SC, Choe HN, Hwang YM, Baik KS, Kim SN, Lee YS, Jung JS, Seong CN (2013) *Marinivirga aestuarii* gen. nov., sp. nov., a member of the family Flavobacteriaceae, isolated from marine environments, and emended descriptions of the genera Hyunsoonleella, Jejuia and Pontirhabdus and the species *Hyunsoonleella jejuensis*, *Jejuia pallidilutea* and *Pontirhabdus pectinivorans*. Int J Syst Evol Microbiol 63:1524–1531

Park K-I, Choi K-S (2001) Spatial distribution of the protozoan parasite *Perkinsus* sp. found in the Manila clams, *Ruditapes philippinarum*, in Korea. Aquaculture 203:9–22

Pascal L (2017) Rôle de l'espèce ingénieure *Upogebia pusilla* dans le fonctionnement biogéochimique des écosystèmes intertidaux à herbier (*Zostera noltei*) du bassin d'Arcachon. University of Bordeaux, Bordeaux, France

Pascal L, Maire O, Volkenborn N, Lecroart P, Bichon S, Montaudouin X de, Gremare A, Deflandre B (2016) Influence of the mud shrimp *Upogebia pusilla* (Decapoda: Gebiidae) on solute and porewater exchanges in an intertidal seagrass (*Zostera noltei*) meadow of Arcachon Bay: An experimental assessment. J Exp Mar Biol Ecol 477:69–79

Pascal L, Montaudouin X de, Grémare A, Maire O (2016) Dynamics of the *Upogebia pusilla–Gyge branchialis* marine host–parasite system. Mar Biol 163

Paul-Pont I, Gonzalez P, Baudrimont M, Jude F, Raymond N, Bourrasseau L, Le Goïc N, Haynes F, Legeay A, Paillard C, Montaudouin X de (2010) Interactive effects of metal contamination and pathogenic organisms on the marine bivalve *Cerastoderma edule*. Mar Pollut Bull 60:515–525

Paul-Pont I, Montaudouin X de, Gonzalez P, Jude F, Raymond N, Paillard C, Baudrimont M (2010) Interactive effects of metal contamination and pathogenic organisms on the introduced marine bivalve *Ruditapes philippinarum* in European populations. Environ Pollut 158:3401–3410

Pekkarinen M (1993) Neoplastic diseases in the Baltic *Macoma balthica* (Bivalvia) off the Finnish coast. J Invertebr Pathol 61:138–146

Penha-Lopes G, Bartolini F, Limbu S, Cannicci S, Mgaya Y, Kristensen E, Paula J (2010) Ecosystem engineering potential of the gastropod *Terebralia palustris* (Linnaeus, 1767) in mangrove wastewater wetlands – A controlled mesocosm experiment. Environ Pollut 158:258–266

Peoples RC, Randhawa HS, Poulin R (2012) Parasites of polychaetes and their impact on host survival in Otago harbour, New Zealand. J Mar Biol Assoc U K 92:449–455

Persson A, Rosenberg R (2003) Impact of grazing and bioturbation of marine benthic deposit feeders on dinoflagellate cysts. Harmful Algae 2:43–50

Phelan K, Blakeslee AMH, Krause M, Williams JD (2016) First documentation and molecular confirmation of three trematode species (Platyhelminthes: Trematoda) infecting the polychaete *Marenzelleria viridis* (Annelida: Spionidae). Parasitol Res 115:183–194

Pike AW, Burt MDB (1981) *Paravortex karlingi* sp. nov. from *Cerastoderma edule* L., in Britain. Hydrobiologia 84:23–30

Piot A, Rochon A, Stora G, Desrosiers G (2008) Experimental study on the influence of bioturbation performed by *Nephtys caeca* (Fabricius) and *Nereis virens* (Sars) annelidae on the distribution of dinoflagellate cysts in the sediment. J Exp Mar Biol Ecol 359:92–101

Pischedda L, Poggiale JC, Cuny P, Gilbert F (2008) Imaging oxygen distribution in marine sediments. The importance of bioturbation and sediment heterogeneity. Acta Biotheor 56:123–135

Poinar GO, Kuris AM (1975) Juvenile *Ascarophis* (Spirurida: Nematoda) parasitizing intertidal decapod crustacea in California: with notes on prevalence and effects on host growth and survival. J Invertebr Pathol 26:375–382

Porchet-Hennere E (1967) Etude des premiers stades de développement de la Coccidie *Coelotropha durchoni*. Zeitsehrift Fiir Zellforsch 80:556–569

Poulin R, Steeper MJ, Miller AA (2000) Non-random patterns of host use by the different parasite species exploiting a cockle population. Parasitology 121:289–295

Powilleit M, Kitlar J, Graf G (2012) Particle and fluid bioturbation caused by the priapulid worm *Halicryptus spinulosus* (v. Seibold). Sarsia 79:109–117

Prado S, Dubert J, Barja JL (2015) Characterization of pathogenic vibrios isolated from bivalve hatcheries in Galicia, NW Atlantic coast of Spain. Description of *Vibrio tubiashii* subsp. *europaensis* subsp. nov. Syst Appl Microbiol 38:26–29

Premo K, Tyler A (2013) Threat of predation alters the ability of benthic invertebrates to modify sediment biogeochemistry and benthic microalgal abundance. Mar Ecol Prog Ser 494:29–39

Pretto T, Zambon M, Civettini M, Caburlotto G, Boffo L, Rossetti E, Arcangeli G (2014) Massive mortality in Manila clams (*Ruditapes philippinarum*) farmed in the Lagoon of Venice, caused by *Perkinsus olseni*. Bull Eur Assoc Fish Pathol 34:43–53

Pronkina NV, Dmitrieva EV, Polyakova TA, Popyuk MP (2017) The lifecycle of *Dichelyne minutus* (Rudolphi, 1819) (Nematoda: Cucullanidae) in the estuarine biocenosis of the Black Sea. Russ J Mar Biol 43:148–155

Qin X, Sun H, Wang C, Yu Y, Sun T (2010) Impacts of crab bioturbation on the fate of polycyclic aromatic hydrocarbons in sediment from the Beitang estuary of Tianjin, China. Environ Toxicol Chem 29:1248–1255

Queirós AM, Stephens N, Cook R, Ravaglioli C, Nunes J, Dashfield S, Harris C, Tilstone GH, Fishwick J, Braeckman U, Somerfield PJ, Widdicombe S (2015) Can benthic community structure be used to predict the process of bioturbation in real ecosystems? Prog Oceanogr 137:559–569

Quintana CO, Tang M, Kristensen E (2007) Simultaneous study of particle reworking, irrigation transport and reaction rates in sediment bioturbated by the polychaetes *Heteromastus* and *Marenzelleria*. J Exp Mar Biol Ecol 352:392–406

Rahman MS, Carraro R, Cardazzo B, Carraro L, Meneguolo DB, Martino ME, Andreani NA, Bordin P, Mioni R, Barco L, Novelli E, Balzan S, Fasolato L (2017) Molecular typing of *Vibrio parahaemolyticus* strains isolated from mollusks in the North Adriatic Sea. Foodborne Pathog Dis 14:454–464

Ramilo A, Abollo E, Villalba A, Carballal MJ (2018) A *Minchinia mercenariae* -like parasite infects cockles *Cerastoderma edule* in Galicia (NW Spain). J Fish Dis 41:41–48

Ramilo A, Carrasco N, Reece KS, Valencia JM, Grau A, Aceituno P, Rojas M, Gairin I, Furones MD, Abollo E, Villalba A (2015) Update of information on perkinsosis in NW Mediterranean coast: Identification of *Perkinsus* spp. (Protista) in new locations and hosts. J Invertebr Pathol 125:37–41

Ramilo A, Iglesias D, Abollo E, González M, Darriba S, Villalba A (2014) Infection of Manila clams *Ruditapes philippinarum* from Galicia (NW Spain) with a *Mikrocytos*-like parasite. Dis Aquat Organ 110:71–79

Ramilo A, Pintado J, Villalba A, Abollo E (2016) *Perkinsus olseni* and *P. chesapeaki* detected in a survey of perkinsosis of various clam species in Galicia (NW Spain) using PCR–DGGE as a screening tool. J Invertebr Pathol 133:50–58

Rangel LF, Castro R, Rocha S, Severino R, Casal G, Azevedo C, Cavaleiro F, Santos MJ (2016) Tetractinomyxon stages genetically consistent with Sphaerospora dicentrarchi (Myxozoa: Sphaerosporidae) found in Capitella sp. (Polychaeta: Capitellidae) suggest potential role of marine polychaetes in parasite's life cycle. Parasitology 143:1067–1073

Rangel LF, Santos MJ, Cech G, Székely C (2009) Morphology, molecular data, and development of *Zschokkella mugilis* (Myxosporea, Bivalvulida) in a polychaete alternate host, *Nereis diversicolor*. J Parasitol 95:561–569

Reece K, Dungan C, Burreson E (2008) Molecular epizootiology of *Perkinsus marinus* and *P. chesapeaki* infections among wild oysters and clams in Chesapeake Bay, USA. Dis Aquat Organ 82:237–248

Renault T, Lipart C, Arzul I (2001) A herpes-like virus infects a non-ostreid bivalve species: virus replication in *Ruditapes philippinarum* larvae. Dis Aquat Organ 45:1–7

Renz JR, Forster S (2014) Effects of bioirrigation by the three sibling species of *Marenzelleria* spp. on solute fluxes and porewater nutrient profiles. Mar Ecol Prog Ser 505:145–159

Rhoads DC, Young DK (1971) Animal-sediment relations in Cape Cod Bay, Massachusetts II. Reworking by *Molpadia oolitica* (Holothuroidea). Mar Biol 11:255–261

Richardson MD, Young DK (1980) Geoacoustic models and bioturbation. Mar Geol 38:205–218

Robaldo RB, Monserrat J, Cousin JCB, Bianchini A (1999) Effects of metacercariae (Digenea: Microphallidae) on the hepatopancreas of *Chasmagnathus granulata* (Decapoda: Grapsidae). Dis Aquat Organ 37:153–157

Ronny Larsson JI, Køie M (2006) The ultrastructure and reproduction of *Amphiamblys capitellides* (Microspora, Metchnikovellidae), a parasite of the gregarine *Ancora sagittata* (Apicomplexa, Lecudinidae), with redescription of the species and comments on the taxonomy. Eur J Protistol 42:233–248

Rothschild M (1935) The trematode parasites of *Turritella communis* Lmk. from Plymouth and Naples. Parasitology 27:152

Rowden AA (2016) Sediment turnover by the stalk-eyed mud crab *Hemiplax hirtipes* (Brachyura: Ocypodoidea) on an intertidal flat in southeastern New Zealand. N Z J Mar Freshw Res 51:279–294

Rowden AA, Jones MB, Morris AW (1998) The role of *Callianassa subterranea* (Montagu) (THALASSINIDEA) in sediment resuspension in the North Sea. Cont Shelf Res 18:1365–1380

Rudnick D, Resh V, Chan V (2005) Morphology and impacts of the burrows of the Chinese mitten crab, *Eriocheir sinensis* H. Milne Edwards (Decapoda, Grapsoidea), in South San Francisco Bay, California, U.S.A. Crustaceana 78:787–807

Russell-Pinto F, Gonçalves JF, Bowers E (2006) Digenean larvae parasitizing *Cerastoderma edule* (Bivalvia) and *Nassarius reticulatus* (Gastropoda) from Ria de Aveiro, Portugal. J Parasitol 92:319–332

Sandwell DR, Pilditch CA, Lohrer AM (2009) Density dependent effects of an infaunal suspension-feeding bivalve (*Austrovenus stutchburyi*) on sand flat nutrient fluxes and microphytobenthic productivity. J Exp Mar Biol Ecol 373:16–25

Sangeetha MS, Shekar M, Venugopal MN (2017) Occurrence of clinical genotype *Vibrio vulnificus* in clam samples in Mangalore, Southwest coast of India. J Food Sci Technol 54:786–791

Sgro L, Mistri M, Widdows J (2005) Impact of the infaunal Manila clam, *Ruditapes philippinarum*, on sediment stability. Hydrobiologia 550:175–182

Shen H, Thrush SF, Wan X, Li H, Qiao Y, Jiang G, Sun R, Wang L, He P (2016) Optimization of hard clams, polychaetes, physical disturbance and denitrifying bacteria of removing nutrients in marine sediment. Mar Pollut Bull 110:86–92

Shields JD (1993) The infestation and dispersion patterns of *Carcinonemertes* spp. (Nemertea) on their crab hosts. Hydrobiologia 266:45–56

Shiell G, Knott B (2010) Aggregations and temporal changes in the activity and bioturbation contribution of the sea cucumber *Holothuria whitmaei* (Echinodermata: Holothuroidea). Mar Ecol Prog Ser 415:127–139

Shim KC, Koprivnikar J, Forbes MR (2013) Variable effects of increased temperature on a trematode parasite and its intertidal hosts. J Exp Mar Biol Ecol 439:61–68

Shull DH, Yasuda M (2001) Size-selective downward particle transport by cirratulid polychaetes. J Mar Res 59:453–473

Siebert AE (1973) A description of haplozoon *Axiothella* n. sp., an endosymbiont of the polychaete *Axiothella rubrocincta*. J Phycol 9:185–190

Silva PM da, Cremonte F, Sabry RC, Rosa RD, Cantelli L, Barracco MA (2009) Presence and histopathological effects of the *Parvatrema* sp. (Digenea, Gymnophallidae) in the stout razor clam *Tagelus plebeius* (Bivalvia, Psammobiidae). J Invertebr Pathol 102:14–20

Simão MF, Leite RB, Rocha C, Cancela ML (2010) Changes in bioturbation of iron biogeochemistry and in molecular response of the clam *Ruditapes decussates* upon *Perkinsus olseni* infection. Arch Environ Contam Toxicol 59:433–443

Smith AE, Chapman JW, Dumbauld BR (2008) Population structure and energetics of the bopyrid isopod parasite *Orthione griffenis* in mud shrimp *Upogebia pugettensis*. J Crustac Biol 28:228–233

Smith SM, Green CW (2015) Sediment suspension and elevation loss triggered by Atlantic mud fiddler crab (*Uca pugnax*) bioturbation in salt marsh Dieback areas of Southern New England. J Coast Res 299:88–94

Sohn W-M, Na B-K, Cho S-H, Lee W-J (2017) Prevalence and density of digenetic trematode metacercariae in clams and oysters from western coastal regions of the Republic of Korea. Korean J Parasitol 55:399–408

Solan M, Wigham B, Hudson I, Kennedy R, Coulon C, Norling K, Nilsson H, Rosenberg R (2004) *In situ* quantification of bioturbation using time-lapse fluorescent sediment profile imaging (f-SPI), luminophore tracers and model simulation. Mar Ecol Prog Ser 271:1–12

Sospedra J, Falco S, Morata T, Rodilla M (2017) Influence of organic enrichment and *Spisula subtruncata* (da Costa, 1778) on oxygen and nutrient fluxes in fine sand sediments. Estuaries Coasts 40:726–740

Sri-aroon P, Lohachit C, Harada M (2005) Brackish-water mollusks of Surat Thani Province, southern Thailand. Southeast Asian J Trop Med Public Health 36 Suppl 4:180–188

Stanzel C, Finelli C (2004) The effects of temperature and salinity on ventilation behavior of two species of ghost shrimp (Thalassinidea) from the northern Gulf of Mexico: a laboratory study. J Exp Mar Biol Ecol 312:19–41

Stead RA, Thompson RJ (2006) The influence of an intermittent food supply on the feeding behaviour of *Yoldia hyperborea* (Bivalvia: Nuculanidae). J Exp Mar Biol Ecol 332:37–48

Stentiford GD, Bateman KS, Dubuffet A, Chambers E, Stone DM (2011) *Hepatospora eriocheir* (Wang and Chen, 2007) gen. et comb. nov. infecting invasive Chinese mitten crabs (*Eriocheir sinensis*) in Europe. J Invertebr Pathol 108:156–166

Studer A, Poulin R (2013) Differential effects of temperature variability on the transmission of a marine parasite. Mar Biol 160:2763–2773

Svoboda J, Strand DA, Vrålstad T, Grandjean F, Edsman L, Kozák P, Kouba A, Fristad RF, Bahadir Koca S, Petrusek A (2014) The crayfish plague pathogen can infect freshwater-inhabiting crabs. Freshw Biol 59:918–929

Swinbanks DD (1981) Sediment reworking and the biogenic formation of clay laminae by *Abarenicola Pacifica*. J Sediment Res 51:1137–1145

Takano T, Warén A, Kano Y (2017) *Megadenus atrae* n. sp., an endoparasitic eulimid gastropod (Mollusca) from the black sea cucumber *Holothuria atra* Jaeger (Aspidochirotida: Holothuriidae) in the Indo-West Pacific. Syst Parasitol 94:699–709

Tanaka Y, Aoki S, Okamoto K (2017) Effects of the bioturbating crab *Macrophthalmus japonicus* on abiotic and biotic tidal mudflat characteristics in the Tama River, Tokyo Bay, Japan. Plankton Benthos Res 12:34–43

Thiel M, Zubillaga GF (1997) The temporal and spatial occurrence of *Tetrastemma fozensis* (Hoplonemertini) in intertidal bivalves. Hydrobiologia 365:257–262

Thieltges DW (2006) Parasite induced summer mortality in the cockle *Cerastoderma edule* by the trematode *Gymnophallus choledochus*. Hydrobiologia 559:455–461

Thieltges DW, Ferguson MAD, Jones CS, Noble LR, Poulin R (2009) Biogeographical patterns of marine larval trematode parasites in two intermediate snail hosts in Europe. J Biogeogr 36:1493–1501

Thieltges DW, Krakau M, Andresen H, Fottner S, Reise K (2006) Macroparasite community in molluscs of a tidal basin in the Wadden Sea. Helgol Mar Res 60:307–316

Thomas F, Renaud F, Meeûs T de, Poulin R (1998) Manipulation of host behaviour by parasites: ecosystem engineering in the intertidal zone? Proc R Soc B Biol Sci 265:1091–1096

Thompson B, Riddle M (2005) Bioturbation behaviour of the spatangoid urchin *Abatus ingens* in Antarctic marine sediments. Mar Ecol Prog Ser 290:135–143

Tibbles BJ, Lucas MI, Coyne VE, Newton ST (1994) Nitrogenase activity in marine sediments from a temperate saltmarsh lagoon: modulation by complex polysaccharides, ammonium and oxygen. J Exp Mar Biol Ecol 184:1–20

Tomiyama T, Yamada K, Wakui K, Tamaoki M, Miyazaki K (2016) Impact of sea spider parasitism on host clams: relationships between burial patterns and parasite loads, somatic condition and survival of host. Hydrobiologia 770:15–26

Trannum HC (2017) Drilling discharges reduce sediment reworking of two benthic species. Mar Pollut Bull 124:266–269

Uthicke S (1999) Sediment bioturbation and impact of feeding activity of *Holothuria (Halodeima) atra* and *Stichopus chloronotus*, two sediment feeding holothurians, at Lizard Island, Great Barrier Reef. Bull Mar Sci 64:129–141

Valdemarsen T, Quintana CO, Thorsen SW, Kristensen E (2018) Benthic macrofauna bioturbation and early colonization in newly flooded coastal habitats (M (Gee) G Chapman, Ed.). PLOS ONE 13:e0196097

Valencia J, Bassitta M, Picornell A, Ramon C, Castro J (2014) New data on *Perkinsus mediterraneus* in the Balearic archipelago: locations and affected species. Dis Aquat Organ 112:69–82

Valigurová A, Paskerova GG, Diakin A, Kováčiková M, Simdyanov TG (2015) Protococcidian *Eleutheroschizon duboscqi*, an unusual apicomplexan interconnecting gregarines and cryptosporidia (T Spielmann, Ed.). PLOS ONE 10:e0125063

Vaugelas J de, Delesalla B, Monier C (1986) Aspects of the biology of *Callichirus armatus* (A. Milne Edwards, 1870) from French Polynesia. Crustaceana 50:204–216

Vaugelas J de, Saint Laurent M de (1984) Premières données sur l'écologie de *Callichirus laurae* de Saint Laurent sp. nov. (Crustace Decapode Callianassidae): son action bioturbatrice sur les formations sedimentaires du golfe d'Aqaba (Mer Rouge). Comptes Rendus Seances - Acad Sci Ser III 298:147–152

Vazquez NN, Ituarte C, Navone GT, Cremonte F (2006) Parasites of the stout razor clam *Tagellus plebeius* (Psammobiidae) from the southwestern Atlantic ocean. J Shellfish Res 25:877–886

Vicente VA, Orélis-Ribeiro R, Najafzadeh MJ, Sun J, Guerra RS, Miesch S, Ostrensky A, Meis JF, Klaassen CH, Hoog GS de, Boeger WA (2012) Black yeast-like fungi associated with Lethargic Crab Disease (LCD) in the mangrove-land crab, *Ucides cordatus* (Ocypodidae). Vet Microbiol 158:109–122

Villalba A, Casas S, López C, Carballal M (2005) Study of perkinsosis in the carpet shell clam *Tapes decussatus* in Galicia (NW Spain). II. Temporal pattern of disease dynamics and association with clam mortality. Dis Aquat Organ 65:257–267

Villalba A, Iglesias D, Ramilo A, Darriba S, Parada J, No E, Abollo E, Molares J, Carballal M (2014) Cockle *Cerastoderma edule* fishery collapse in the Ría de Arousa (Galicia, NW Spain) associated with the protistan parasite *Marteilia cochillia*. Dis Aquat Organ 109:55–80

Volkenborn N, Meile C, Polerecky L, Pilditch CA, Norkko A, Norkko J, Hewitt JE, Thrush SF, Wethey DS, Woodin SA (2012) Intermittent bioirrigation and oxygen dynamics in permeable sediments: An experimental and modeling study of three tellinid bivalves. J Mar Res 70:794–823

Volkenborn N, Polerecky L, Wethey D, DeWitt T, Woodin S (2012) Hydraulic activities by ghost shrimp *Neotrypaea californiensis* induce oxic−anoxic oscillations in sediments. Mar Ecol Prog Ser 455:141–156

Vonk JA, Kneer D, Stapel J, Asmus H (2008) Shrimp burrow in tropical seagrass meadows: An important sink for litter. Estuar Coast Shelf Sci 79:79–85

Vuddhakul V, Soboon S, Sunghiran W, Kaewpiboon S, Chowdhury A, Ishibashi M, Nakaguchi Y, Nishibuchi M (2006) Distribution of virulent and pandemic strains of *Vibrio parahaemolyticus* in three molluscan shellfish species (*Meretrix meretrix*, *Perna viridis*, and *Anadara granosa*) and their association with foodborne disease in southern Thailand. J Food Prot 69:2615–2620

Wagley S, Koofhethile K, Rangdale R (2009) Prevalence and potential pathogenicity of *Vibrio parahaemolyticus* in chinese mitten crabs (*Eriocheir sinensis*) harvested from the river Thames estuary, England. J Food Prot 72:60–66

Waldbusser GG, Marinelli RL (2009) Evidence of infaunal effects on porewater advection and biogeochemistry in permeable sediments: A proposed infaunal functional group framework. J Mar Res 67:503–532

Wang W, Chen J (2007) Ultrastructural study on a novel microsporidian, *Endoreticulatus eriocheir* sp. nov. (Microsporidia, Encephalitozoonidae), parasite of Chinese mitten crab, *Eriocheir sinensis* (Crustacea, Decapoda). J Invertebr Pathol 94:77–83

Wang W, Gu Z (2002) Rickettsia-like organism associated with tremor disease and mortality of the Chinese mitten crab *Eriocheir sinensis*. Dis Aquat Organ 48:149–153

Wang W, Gu W, Gasparich GE, Bi K, Ou J, Meng Q, Liang T, Feng Q, Zhang J, Zhang Y (2011) *Spiroplasma eriocheiris* sp. nov., associated with mortality in the Chinese mitten crab, *Eriocheir sinensis*. Int J Syst Evol Microbiol 61:703–708

Webb AP, Eyre BD (2004a) Effect of natural populations of burrowing thalassinidean shrimp on sediment irrigation, benthic metabolism, nutrient fluxes and denitrification. Mar Ecol Prog Ser 268:205–220

Webb AP, Eyre BD (2004b) The effect of natural populations of the burrowing and grazing soldier crab (*Mictyris longicarpus*) on sediment irrigation, benthic metabolism and nitrogen fluxes. J Exp Mar Biol Ecol 309:1–19

Wegeberg AM, Jensen KT (1999) Reduced survivorship of *Himasthla* (Trematoda, Digenea)-infected cockles (*Cerastoderma edule*) exposed to oxygen depletion. J Sea Res 42:325–331

White IC (1972) On the ecology of an adult digenetic trematode *Proctoeces subtenuis* from a Lamellibranch host *Scrobicularia plana*. J Mar Biol Assoc U K 52:457

Wilson CA, Hughes ZJ, FitzGerald DM (2012) The effects of crab bioturbation on Mid-Atlantic saltmarsh tidal creek extension: Geotechnical and geochemical changes. Estuar Coast Shelf Sci 106:33–44

Witbaard R, Bergman MJN, Weerlee E van, Duineveld GCA (2017) An estimation of the effects of *Ensis directus* on the transport and burial of silt in the near-shore Dutch coastal zone of the North Sea. J Sea Res 127:95–104

Wolfe K, Byrne M (2017) Biology and ecology of the vulnerable holothuroid, *Stichopus herrmanni*, on a high-latitude coral reef on the Great Barrier Reef. Coral Reefs 36:1143–1156

Wrede A, Dannheim J, Gutow L, Brey T (2017) Who really matters: Influence of German Bight key bioturbators on biogeochemical cycling and sediment turnover. J Exp Mar Biol Ecol 488:92–101

Wu S, Wang C, Lin X, Wang Z, Li X, Liu J, Deng J, Qiu S (2011) Infection prevalence and phylogenetic analysis of *Perkinsus olseni* in *Ruditapes philippinarum* from East China. Dis Aquat Organ 96:55–60

Wunderlich AC, Carmona-Suarez CA, Pinheiro MAA (2017) New records of the isopod *Leidya distorta* infesting the mangrove crab *Ucides cordatus* from South America. Bol Inst Pesca 43:283–290

Xie L, Xie Z (2018) Prevalence of *Marteilia* spp. in thirteen shellfish species collected from China coast. Turk J Fish Aquat Sci 18:753–759

Xu K, Song W, Warren A (1999) Trichodinid ectoparasites (Ciliophora: Peritrichida) from the gills of mariculture molluscs in China, with the descriptions of four new species of *Trichodina* Ehrenberg, 1838. Syst Parasitol 42:229–237

Yamada H, Kayama M (1987) Liberation of nitrogenous compounds from bottom sediments and effect of bioturbation by small bivalve, *Theora lata* (Hinds). Estuar Coast Shelf Sci 24:539–555

Yanagida T, Shirakashi S, Iwaki T, Ikushima N, Ogawa K (2009) Gymnophallid digenean *Parvatrema duboisi* uses Manila clam as the first and second intermediate host. Parasitol Int 58:308–310

Yang H-S, Park K-J, Choi K-S (2010) Pathologic survey on the Manila clam *Ruditapes philippinarum* (Adams and Reeve 1850) from Haeju off the western coastal Yellow Sea. Ocean Sci J 45:93–100

Yang J, Zhan W, Zhou L, Xing J (2008) Purification, virulence and characterization of an extracellular peptidase produced by *Aeromonas salmonicida* ssp. *masoucida* isolated from cultured sea cucumber *Apostichopus japonicus*. Dis Aquat Organ 82:223–229

Yanin L, Kang H-S, Hong H-K, Jeung H-D, Kim B-K, Le TC, Kim Y-O, Choi K-S (2013) Molecular and histological identification of *Marteilioides* infection in Suminoe oyster *Crassostrea ariakensis*, Manila clam *Ruditapes philippinarum* and Pacific oyster *Crassostrea gigas* on the south coast of Korea. J Invertebr Pathol 114:277–284

Yano Y, Kaneniwa M, Satomi M, Oikawa H, Chen S-S (2006) Occurrence and density of *Vibrio parahaemolyticus* in live edible crustaceans from markets in China. J Food Prot 69:2742–2746

Yue X, Liu B, Sun L (2011) Isolation and characterization of a virulent *Vibrio* sp. bacterium from clams (*Meretrix meretrix*) with mass mortality. J Invertebr Pathol 106:242–249

Zhan Z, Li J, Xu K (2018) Detection and quantification of two parasitic ciliates *Boveria labialis* and *Boveria subcylindrica* (Ciliophora: Scuticociliatia) by fluorescence *in situ* hybridization. J Eukaryot Microbiol

Zhang S, Bonami J-R (2007) A roni-like virus associated with mortalities of the freshwater crab, *Eriocheir sinensis* Milne Edwards, cultured in China, exhibiting “sighs disease” and black gill syndrome. J Fish Dis 30:181–186

Zhang J, Cao Z, Li Z, Wang L, Li H, Wu F, Jin L, Li X, Li S, Xu Y (2015) Effect of bacteriophages on *Vibrio alginolyticus* infection in the sea cucumber, *Apostichopus japonicus* (Selenka). J World Aquac Soc 46:149–158

Zorn ME, Lalonde SV, Gingras MK, Pemberton SG, Konhauser KO (2006) Microscale oxygen distribution in various invertebrate burrow walls. Geobiology 4:137–145