

FAIRBAIRN ODD COUPLES (2013)

SUPPLEMENTARY TABLE B

Sexual dimorphisms in dioecious species: presence/absence of morphological traits that show externally apparent differences between the sexes in animal classes that include at least some dioecious species. Phyla and classes are listed in alphabetical order within four major evolutionary groupings: Deuterostomia, Ecdysozoa, Lophotrochozoa and the non-bilaterian phyla.

<i>Phylum, Class</i>	<i>Common names</i>	<i>Visible gonads</i>	<i>Genital opening<sup>a</sup></i>	<i>Body size<sup>b</sup></i>		<i>Body shape<sup>c</sup></i>	<i>Appendages<sup>d</sup></i>	<i>Integument<sup>e</sup></i>	<i>Color<sup>f</sup></i>
				<i>Males larger</i>	<i>Females larger</i>				
BILATERIAN PHYLA									
DEUTEROSTOMIA									
CHORDATA									
Actinopterygii	Ray-finned fishes		x, int.	x	x*, dm	x, bp	x		x
Amphibia	Amphibians		x, int.	x	x*, dm	x	x	x	x
Aves	Birds			x*	x	x	x	x	x
Cephalaspidomorphi	Lampreys		x		x	x	x		
Cephalochordata	Lancelets	x							
Elasmobranchii	Sharks, skates, rays		x, int.	x	x*	x	x	x	
Holocephali	Chimeras, ratfish, ghost sharks		x, int.		x		x	x	
Mammalia	Mammals	x	x, int.	x*	x	x		x	x

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				<i>Males larger</i>	<i>Females larger</i>				
Reptilia	Reptiles		x, int.	x	x, dm	x	x	x	x
Sarcopterygii	Lobe-finned fishes				x	x	x		
ECHINODERMATA									
Asteroidea	Sea stars		x, int.		x				
Crinoidea	Sea lilies, feather stars				x	x, bp			
Echinoidea	Sea urchins, sand dollars		x			x, bp			
Holothurioidea	Sea cucumbers		x, int.						
Ophiuroidea	Brittle stars		x		x, dm			x	
HEMICHORDATA									
Enteropneusta	Acorn worms	x	x						x
Pterobranchia					x		x		x
ECDYSOZOA									
ARTHROPODA									
Arachnida	Spiders, scorpions, mites, ticks		x, int.	x	x*, dm	x	x	x	x

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				<i>Males larger</i>	<i>Females larger</i>				
Branchiopoda	Freshwater crustaceans incl. cladocerans and fairy shrimp		x, int.		x, dm	x, bp			
Chilopoda	Centipedes		x		x	x	x		
Diplopoda	Millipedes		x, int.		x	x			x
Entognatha	Springtails and relatives				x	x	x		x
Insecta	Insects		x, int.	x	x*, dm	x	x	x	x
Malacostraca	Crustaceans incl. crabs, lobsters, shrimp and relatives		x, int.	x*	x, dm	x, bp	x	x	x
Maxillopoda	Crustaceans including barnacles, copepods and relatives		x, int.		x, dm	x, bp	x	x	x
Merostomata	Horseshoe crabs				x		x		
Ostracoda	Seed or mussel shrimp		x, int.	x			x		
Pauropoda									

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				<i>Males larger</i>	<i>Females larger</i>				
Pycnogonida	Sea spiders						x		
Symphyla	Garden centipedes								
CEPHALORHYNCHA									
Kinorhyncha			x, int.			x			
Loricifera			x, int.		x			x	
Priapulida	Penis worms		x					x	
NEMATA									
Adenophorea			x, int.		x, dm	x		x	
Secernentea			x, int.		x, dm	x		x	
NEMATOMORPHA	Horse-hair worms			x	x*	x			
ONYCHOPHORA	Velvet worms		x		x	x	x	x	
TARDIGRADA									
Eutardigrada			x		x	x	x		
Heterotardigrada			x, int.		x	x	x		
LOPHOTROCHOZOA									
ACANTHOCEPHALA	Spiny- or thorny-								

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				<i>Males larger</i>	<i>Females larger</i>				
	headed worms								
Archiacanthocephala			x, int.		x, dm	x		x	
Eocanthacephala			x, int.		x, dm	x		x	
Palaeacanthocephala			x, int.		x, dm	x		x	
ANNELIDA									
Polychaeta	Polychaete worms		x, int.		x, dm	x	x	x	
BRACHIOPODA									
Articulata						x, bp			
Inarticulata						x, bp			
CYCLIOPHORA									
Eucycliophora			x, int		x, dm	x			
ECHIURA									
Echiurida	Spoon worms				x, dm	x	x		
ECTOPROCTA									
Gymnolaemata	Bryozoans or moss animals		x						

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				<i>Males larger</i>	<i>Females larger</i>				
ENTOPROCTA	Goblet worms			x*	x	x, bp			
MESOZOA									
Orthonectida					x	x		x	
MOLLUSCA									
Aplacophora		x	x, int.						
Bivalvia (Pelecypoda)	Bivalves incl. clams, mussels and relatives				x, dm	x			
Cephalopoda	Octopods, Squid, Nautiloids				x, dm	x	x		
Gastropoda	Snails, slugs		x, int.	x	x*, dm	x		x	x
Monoplacophora									
Polyplacophora	Chitons	x		x					x
Scaphopoda	Tusk shells	x				x			
NEMERTEA (RHYNCHOCOELA)	Ribbon worms								
Anopla		x			x	x			
Enopla		x			x, dm	x			x

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				<i>Males larger</i>	<i>Females larger</i>				
PHORONIDA	Horseshoe worms					x	x		
PLATYHELMINTHES									
Trematoda	Flukes		x, int.		x	x			
Turbellaria	Non-parasitic Flatworms		x, int.		x, dm	x			
ROTIFERA									
Eurotatoria			x, int.		x, dm	x	x		x
Pararotatoria				x	x	x			x
SIPUNCULA	Peanut worms	x							
NON-BILATERIAN PHYLA									
CNIDARIA									
Anthozoa	Anenomes, corals, sea fans	x			x	x, bp			x
Cubozoa	Box jellies	x							x
Hydrozoa	Hydra, Portuguese Man 'o war, and relatives	x				x, bp	x		

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				<i>Males larger</i>	<i>Females larger</i>				
Scyphozoa	Jellies	x							
Staurozoa	Stalked jellies	x							
CTENOPHORA	Comb jellies								
Tentaculata		x							
PORIFERA	Sponges								
Calcarea									
Demospongia									x
Total classes: <sup>g</sup>	73	15	39	15	47	48	27	24	19

<sup>a</sup> int: male genitalia are modified for intromission.

<sup>b</sup> In classes with both male-larger and female-larger sexual size dimorphism, the dominant pattern (if any) is indicated by an asterix. dm: dwarf males have been reported.

<sup>c</sup> Includes head and tail but not sensory and locomotory appendages. bp: brood pouches have been reported.

<sup>d</sup> Includes the number, size and shape of locomotory and sensory appendages such as antennae, legs, wings, and fins, as well as non-genital appendages modified to act as intromittent organs. Tail dimorphisms are not included.

<sup>e</sup> Includes the size, number, distribution or shape of cilia, scales, spines, hooks, bristles, feathers, hair, horns and teeth. Although not integumental structures, the antlers of mammals are included in this category because they are analogous in function to the sexually-selected horns and spines of other animals.

<sup>f</sup> Excluding color of externally visible gonads.

<sup>g</sup> Phyla with no recognized class designations are included as single classes in these counts.

*Sources:*

**Primary sources:** Breder and Rosen (1966), Geise and Pearse (1974, 1975a,b, 1977, 1979), Ghiselin (1974), Blackwelder and Shepherd (1981), Bell (1982), Charnov (1982), Adiyodi and Adiyodi (1989, 1990, 1992, 1993, 1994), Fairbairn 1997, Lombardi (1998), Conn (2000), Pechenik (2005), Jarne and Auld (2006), de Meeûs et al (2007), Fairbairn et al (2007), and Hickman et al. (2007).

**Additional sources for specific groups:**



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Acanthocephala: Poulin and Morand (2000)  
Arthropoda: Sharma and Metz (1976), Gilbert (1983), Chae and Nishida (1994), Poulin, 1996, Hopkin (1997), Minelli et al (2000), Ohtsuka and Huys (2001), Li et al. (2008)  
Brachiopoda: James et al. (1991)  
Cephalorhyncha : Neuhaus & Higgins (2002), Kristensen (2002)  
Chordata: Shine (1979), Breder and Rosen (1966), Sims (2005), Filiz & Taskavak (2006), Cox et al. (2007), Kupfer (2007), Lindenfors et al. (2007)  
Cnidaria: Lewis and Long (2005)  
Ctenophora: Harbison and Miller (1986)  
Echinodermata: Vail (1987), Hamel and Himmelman (1992), O'Loughlin (2001), Stöhr (2001), Emler (2002), Tominaga et al (2004)  
Hemichordata: Hadfield (1975), Sastry (1979), Heller (1993)  
Mollusca: Crozier (1920), Coe (1944), Webber (1977), McFadien-Carter (1979), Pearse (1979), Heller (1993), Gowlett-Holmes (2001), Lamprell and Healy (2001), Lu (2001), Schwabe (2008)  
Myxozoa: Kent et al (2001).  
Nemata: Maggenti (1981), Poulin (1997)  
Nematopmorma: Schmidt-Rhaesa (2002), Cochran et al. (2004)  
Nemertea: McDermott and Gibson (1993), Roe (1993), Stricker et al. (2000), Döhren and Bartolomaeus (2006)  
Phoronida: Temereva and Malakhov (2001)  
Placozoa: Pearse and Voigt 2007)  
Platyhelminthes: Campbell (1970), (Bell 1982)  
Rotifera: Gilbert and Williamson (1983), Ricci et al. (1993)  
Tardigrada: Guldberg and Kristensen (2006), Claxton (1996), Garey et al. (2008)