Supplementary table 1: Overview of analysed species. This information was collected directly from the cited literature. References include information regarding cellular mode of reproduction, origin of asexuality and/or the age of asexuality.

species	common name	NCBI accesion	cellular mechanism of parthenogenesis	evidence	hybrid origin	age of asexuality [y]	references
Poecilia formosa	amazon molly	SAMN01797685	sperm-dependent functional mitotic	cytology, genetics	yes	100 k	[1]
Adineta vaga	bdelloid rotifer	SAMEA2043852	functional mitotic	stained karyotypes have no apparent chromosome pairs		46 M	[2,3]
Adineta ricciae	bdelloid rotifer	SAMEA104393659	functional mitotic			46 M	[3,4]
Rotaria macrura	bdelloid rotifer	SAMEA104393678	functional mitotic	no direct evidence[1]		46 M	[5,6]
Rotaria magnacalcarata	bdelloid rotifer	SAMEA104393684	functional mitotic	no direct evidence[1]		46 M	[5,6]
Leptopilina clavipes	parasitoid wasp	SAMN02047179	gamete duplication[2]	cytology	no	6-43 k	[7]
Trichogramma pretiosum	trichogramma wasp	SAMN02439301	gamete duplication[2]	cytology, genetic markers	no	"few"	[8,9]
Ooceraea biroi[3]	raider ant	SAMN02428046	central fusion	cytology, RAD seq	no		[10]
Apis mellifera capensis	cape honey bee	SAMN10245904 SAMN10245906	central fusion	cytology	no	20	[11]
Aptinothrips rufus	thrip		gamete duplication[4]		no	150-200 k	[12]
Folsomia candida	springtail	SAMN04196550	terminal fusion[4]	cytology	no		[13]
Daphnia pulex	water flea	SAMN03964753 SAMN03964750	central fusion equivalent	No separation at meiosis I; abortive meiosis	yes	1-170 k	[14]
Procambarus virginalis	marbled crayfish	SAMN07142640	functional mitotic	microsat study, histological evidence		less than 30	[15–17]
Plectus sambesii	nemotode	SAMN07227113	unknown meiotic	2 meiotic divisions, 2 polar bodies, but no fusions were observed, putative endoduplication			[18]
Mesorhabditis belari	nemotode	SAMEA5150020	unknown meiotic	cytology; 2 meiotic divisions observed			[19]
Diploscapter coronatus	nemotode	SAMD00025087	unknown		yes		[18,20]

[1] Meiosis was not observed in two bdelloid rotifers *Habrotrocha tridens* and *Philodina roseola*, both members of *Philodinidae*, the same family as *Rotaria*.
[2] *Wolbachia* induced
[3] formerly *Cerapachys biroi*
[4] suggested that it is endosymbiont induced

Diploscapter pachys	nematode	SAMN03456257	functional mitotic	formally central fusion (meiosis I skipped), no recombination, only sister chromatid separation	yes	18 M[5]	[21]
Panagrolaimus davidi	nemotode	SAMN02741088	unknown	polar body produced	yes	1.3-8.5 M	[22]
Acrobeloides nanus	nemotode	SAMN06041019	unknown meiotic				[18]
Meloidogyne incognita	root-knot nematode	SAMEA104032784 SAMN05712521	functional mitotic		yes	"recently"	[23–25]
Meloidogyne javanica	root-knot nematode	SAMEA3298191 SAMN05712519	functional mitotic		yes	"recently"	[25]
Meloidogyne arenaria	root-knot nematode	SAMEA3298190 SAMN05712513 SAMN08721831	functional mitotic		yes	"recently"	[25]
Meloidogyne floridensis	peach root-knot nematode	SAMN05712529	unknown	meiotic mechanism suggested by cytology; however the study conflicts in ploidy with the data in this study (see S1)	yes	"recently"	[25, 26]
Meloidogyne enterolobii	root-knot nematode	SAMN05712528	functional mitotic		yes	"recently"	[25]
Hypsibius dujardini	tardigrade; water bear	SAMEA3679301	terminal fusion equivalent	meiosis II suppressed			[27]
Ramazzottius varieornatus	tardigrade; water bear; Kumamushi	SAMD00054187		no males have been found			[6]

[5] Assuming non-hybrid origin suggested by Hiraki at al. 2017.
[6] personal communication with Mark Blaxter

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