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## Haldane's rule in the 21st century

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Species	Taxonomic group	Inviability / Fertility	Method	Obeying Haldane's rule	Alternative	Suggested theory	Authors
<i>Alouatta pigra</i> and <i>A. palliata</i>	Mammalia	Inviability	Quantification of introgression	Only in one direction			Cortés-Ortiz et al. 2007
<i>Alouatta caraya</i> and <i>A. clamitans</i>	Mammalia	Inviability	Quantification of introgression	Yes			Aguiar et al. 2008
<i>M. musculus</i> and <i>M. domesticus</i>	Mammalia	Inviability	Quantification of introgression	Yes		Faster X	Payseur 2004
<i>Peromyscus polionotus</i> and <i>P. maniculatus</i>	Mammalia	Inviability	Experimental crosses	Yes			Vrana et al. 2000
2 haplotype clades of <i>Elephas maximus</i>	Mammalia	Reduced reproductive success	Quantification of introgression	Yes		Faster male	Fickel et al. 2007
<i>Arctocephalus gazella</i> , <i>A. tropicalis</i> and <i>A. forsteri</i>	Mammalia	Reduced reproductive success	Quantification of introgression	Yes			Lancaster et al. 2007
<i>Sorex antinorii</i> and <i>S. araneus</i> (race Cordon)	Mammalia	Sterility	Quantification of introgression	Yes			Balloux et al. 2000
<i>Thrichomus pachyurus</i> , <i>T. apereoides apereoides</i> , and <i>T. a. laurentius</i>	Mammalia	Sterility	Experimental crosses	Yes		Dominance	Borodin et al. 2006
<i>Sorex araneus</i> (Drnholec and Bialowie chromosome races)	Mammalia	Sterility	Quantification of introgression	Yes			Jadwiszczak et al. 2006
<i>Phyllotis mugister</i> and <i>P. darwini</i>	Mammalia	Sterility	Experimental crosses	Yes			Walker et al. 1999
<i>Sorex antinorii</i> and <i>S. araneus</i> (race Vaud)	Mammalia	Sterility	Quantification of introgression	Yes			Yannic et al. 2008
<i>Vermivora pinus</i> and <i>V. chrysoptera</i>	Aves	Inviability	Sex Ratio observations	No (B)	no immediate evidence of a hybrid disadvantage		Neville et al. 2008
<i>Dendroica occidentalis</i> and <i>D. townsendi</i>	Aves	Inviability	Sex Ratio observations	No (B)	Species too closely related		Smith and Rohwer 2000
<i>Poecile atricapillus</i> and <i>P. carolinensis</i>	Aves	Inviability	Quantification of introgression	Yes			Bronson et al. 2005
<i>Passerina amoena</i> and <i>P. cyanea</i>	Aves	Inviability	Quantification of introgression	Yes		Dominance Faster Z	Carling & Brumfield 2008
<i>Larus hyperboreus</i> , <i>L. argentatus</i> , <i>L. fuscus</i> , <i>L. smithsonianus</i> , <i>L. michahellis</i> and <i>L. marinus</i>	Aves	Inviability	Quantification of introgression	Yes		Faster heterogametic sex	Crochet et al. 2003

<i>Larus argentatus</i> and <i>Larus cachinnans</i>	Aves	Inviability	Quantification of introgression	Yes		Faster heterogametic sex	Gay et al. 2007
<i>Anas rubripes</i> and <i>Anas platyrhynchos</i>	Aves	Inviability	Experimental crosses	Yes			Kirby et al. 2004
20 species of Pigeons and doves	Aves	Inviability	Experimental crosses	Yes		Faster heterogametic sex	Lijtmaer et al. 2003
<i>Lagopus lagopus</i> and <i>L. muta</i>	Aves	Inviability	Quantification of introgression	Yes		Faster heterogametic sex	Quintela et al. 2010
4 species of Flycatchers (Muscicapidae)	Aves	Inviability	Quantification of introgression	Yes			Saetre et al. 2001
161 interspecific crosses of ducks (Anatinae)	Aves	Inviability	Quantification of introgression	Yes			Tubaro and Lijtmaer 2002
<i>Ficedula hypoleuca</i> and <i>F. albicollis</i>	Aves	Inviability	Experimental crosses	Yes			Veen et al. 2001
<i>Larus hyperboreus</i> and <i>L. argentatus</i>	Aves	Inviability	Quantification of introgression	Yes		Faster heterogametic sex	Vigfúsdóttir et al. 2008
<i>Erythrura gouldiae</i> (red and black color morph)	Aves	Inviability (but not sterility)	Experimental crosses	Yes			Prike and Griffith 2009
<i>Phylloscopus collybita collybita</i> and <i>P. c. brehmii</i>	Aves	Inviability + sterility	Quantification of introgression	Yes			Bensch et al. 2002
<i>Phylloscopus collybita</i> and <i>P. brehmii</i>	Aves	Sterility	Quantification of introgression	Yes			Helbig 2001
<i>Aquila clanga</i> and <i>A. pomarina</i>	Aves	Sterility	Quantification of introgression	Yes			Helbig et al. 2005
<i>Lacerta agilis</i> (populations from Sweden and central Europe)	Reptilia	Inviability (but not sterility)	Experimental crosses	Yes			Olsson et al. 2004
<i>Triturus cristatus</i> and <i>T. marmoratus</i>	Amphibia	Inviability	Quantification of introgression	Only in one direction	Cytoneuclear incompatibilities		Arntzen 2002, 2009
<i>Xenopus laevis</i> and <i>X.muelleri</i>	Amphibia	Sterility	Experimental crosses	No (A)	improper interactions with hormones and receptors		Malone et al. 2007
93 hybridizations of species of the genus <i>Bufo</i>	Amphibia	Inviability (but not sterility)	Experimental crosses	Yes (for 65 cases)*		Dominance	Malone & Fontenot 2008

37 hybridizations of 32 species of the family Centrarchidae	Teleostei	Inviability	Quantification of introgression	No (B)	Mitonuclear incompatibilities		Bolnick & Near 2005; Bolnick et al. 2008
<i>Etheostoma luteovinctum</i> and <i>E. hopkinsi</i>	Teleostei	Inviability	Experimental crosses	Only in one direction			Mendelson et al. 2007
<i>Fundulus euryzonus</i> and <i>F. notatus</i>	Teleostei	Inviability	Experimental crosses	Only in one direction			Vigueira et al. 2007
<i>Fundulus euryzonus</i> and <i>F. olivaceus</i>	Teleostei	Inviability	Experimental crosses	Only in one direction			Vigueira et al. 2007
<i>Hexagrammos agrammus</i> , <i>H. octogrammus</i> and <i>H. otakii</i>	Teleostei	Inviability	Quantification of introgression	Yes			Crow et al. 2007
Two genetically distinct laboratory strains of <i>Danio rerio</i>	Teleostei	Inviability	Experimental crosses	Yes			Lawrence et al. 2008
<i>Cyprinodon elegans</i> and <i>C. variegatus</i>	Teleostei	Inviability	Experimental crosses	Yes		Faster male Dominance	Tech 2006
fresh- and bracketwater types of <i>Pungitius pungitius</i>	Teleostei	Sterility	Experimental crosses	Yes		Faster male Dominance	Takahashi et al. 2005
PA, PF, and JA forms of <i>Gasterosteus aculeatus</i>	Teleostei	Sterility	Quantification of introgression	Yes		Faster X	Yamada and Goto 2003; Kitano et al. 2007, 2009
<i>Poecilia reticulata</i> (Caroni and Oropuche populations)	Teleostei	Sterility (but not inviability)	Experimental crosses	Yes			Russell and Magurran 2006
<i>Liriomyza trifolii</i> and <i>L. sativae</i>	Insecta: Diptera	Inviability	Experimental crosses	Only in one direction			Sakamaki et al. 2005
<i>Anastrepha fraterculus</i> and <i>A. obliqua</i>	Insecta: Diptera	Inviability	Experimental crosses	Only in one direction			dos Santos et al. 2001
<i>Anastrepha sororcula</i> and <i>A. obliqua</i>	Insecta: Diptera	Inviability	Experimental crosses	Only in one direction			dos Santos et al. 2001
2 populations of <i>Anastrepha fraterculus</i>	Insecta: Diptera	Inviability	Experimental crosses	Only in one direction			Selivon et al. 1999
<i>Aedes polynesiensis</i> , <i>Ae. pseudoscutellaris</i> and <i>Ae. kesseli</i>	Insecta: Diptera	Sterility	Experimental crosses	Incomplete			Dev and Rai 2006
<i>Drosophila yakuba</i> and <i>D. santomea</i>	Insecta: Diptera	Sterility	Experimental crosses	Yes		Faster X Dominance Faster male	Coyne et al. 2004; Moehring et al. 2006
<i>Anastrepha fraterculus</i> and <i>A. sororcula</i>	Insecta: Diptera	Sterility		Yes			dos Santos & Matioli (unpublished)
<i>Glossina palpalis palpalis</i> and <i>G. p. gambiensis</i>	Insecta: Diptera	Sterility	Experimental crosses	Yes			Gooding 1997

<i>Glossina swynnertoni</i> and <i>G. morsitans centralis</i>	Insecta: Diptera	Sterility	Experimental crosses	Yes			Gooding 1997
<i>Glossina swynnertoni</i> and <i>G. morsitans morsitans</i>	Insecta: Diptera	Sterility	Experimental crosses	Yes			Gooding 1997
4 species of the <i>Drosophila virilis</i> subgroup	Insecta: Diptera	Sterility	Experimental crosses	Yes		Dominance	Heikkinen and Lummen 1998
<i>Anopheles albitarsis</i> s.s. and <i>A. deaneorum</i>	Insecta: Diptera	Sterility	Experimental crosses	Yes			Lima et al. 2004
<i>Drosophila mauritiana</i> and <i>D. sechellia</i>	Insecta: Diptera	Sterility	Construction of introgression lines	Yes		Dominance Faster male Faster X	Masly and Presgraves 2007
<i>Drosophila bipectinata</i> and <i>D. parabipectinata</i>	Insecta: Diptera	Sterility	Experimental crosses	Yes		X-Y interactions	Mishra and Singh 2007
<i>Drosophila bipectinata</i> and <i>D. pseudoananassae</i>	Insecta: Diptera	Sterility	Experimental crosses	Yes		X-Y interactions	Mishra and Singh 2007
<i>Drosophila malerkotliana</i> and <i>D. bipectinata</i>	Insecta: Diptera	Sterility	Experimental crosses	Yes		X-autosome interactions	Mishra and Singh 2007
<i>Drosophila malerkotliana</i> and <i>D. parabipectinata</i>	Insecta: Diptera	Sterility	Experimental crosses	Yes		X-autosome interactions	Mishra and Singh 2007
<i>Drosophila persimilis</i> and <i>D. pseudoobscura bogotana</i>	Insecta: Diptera	Sterility	Experimental crosses	Yes		Dominance	Chang and Noor 2007
<i>Drosophila pseudoobscura</i> (Bogota and USA subspecies)	Insecta: Diptera	Sterility	Experimental crosses	Yes		X-autosome interactions	Orr and Irving 2001
<i>Drosophila recens</i> and <i>D. subquinaria</i>	Insecta: Diptera	Sterility	Experimental crosses	Yes			Shoemaker 1999
<i>Drosophila simulans</i> and <i>D. mauritiana</i>	Insecta: Diptera	Sterility	Experimental crosses	Yes		Faster heterogametic sex	Tao and Hartl 2003
<i>Anopheles gambiae</i> and <i>A. arabiensis</i>	Insecta: Diptera	Sterility	Experimental crosses	Yes (in backcross)		Dominance Faster male	Slotman et al. 2005
<i>Cyrtodiopsis dalmanni</i> and <i>C. whitei</i>	Insecta: Diptera	Sterility (but not inviability)	Experimental crosses	Yes		Faster male	Christianson et al. 2005
<i>Limnopus dissortis</i> and <i>L. notabilis</i>	Insecta: Hemiptera	Inviability	Quantification of introgression	No (A)	Cytonuclear incompatibilities		Abe et al. 2005
<i>Aquarius remigoides</i> and <i>A. remigis</i>	Insecta: Hemiptera	Inviability + sterility	Experimental crosses + quantification of introgression	Only in one direction			Gallant and Fairbairn 1997

<i>Nasonia vitripennis</i> , <i>N. longicornis</i> and <i>N. giraulti</i>	Insecta: Hymenoptera	Inviability	Experimental crosses	Yes		Dominance Faster male Faster X	Koevoets and Beukeboom 2009
<i>Formica aquilonia</i> and <i>F. polyctena</i>	Insecta: Hymenoptera	Inviability	Quantification of introgression	Yes			Kulmuni et al. 2010
<i>Tribolium castaneum</i> (Colombia and Ecuador populations)	Insecta: Coleoptera	Deformities	Experimental crosses	Yes (temperature dependent)		X-autosome interactions	Demuth & Wade 2007
<i>Ohomopterus insulicola</i> and <i>O. arrowianus</i>	Insecta: Coleoptera	Sterility	Experimental crosses	Yes			Sota et al. 2000
<i>Carabus yamato</i> and <i>C. albrechti</i>	Insecta: Coleoptera	Sterility	Experimental crosses	Yes			Takami et al. 2007
<i>Carabus punctatoauratus</i> and <i>C. splendens</i>	Insecta: Coleoptera	Sterility (but not inviability)	Experimental crosses	Yes			Brouat et al. 2006
<i>Danaus erippus</i> and <i>Danaus plexippus nigrippus</i>	Insecta: Lepidoptera	Inviability	Experimental crosses	Yes			Hay-roe et al. 2007
<i>Papilio machaon</i> and <i>P. hospiton</i>	Insecta: Lepidoptera	Inviability	Quantification of introgression	Yes			Cianchi et al. 2003
<i>Danaus chrysippus</i> and <i>D. gilippus</i>	Insecta: Lepidoptera	Inviability (but not sterility)	Experimental crosses	Yes			Smith et al. 2002
<i>Anartia fatima</i> and <i>A. amathea</i>	Insecta: Lepidoptera	Inviability + sterility	Experimental crosses	Yes		Dominance	Davies et al. 1997
<i>Helicoverpa armigera</i> and <i>H. assulta</i>	Insecta: Lepidoptera	Sterility	Experimental crosses	Only in one direction			Tang et al. 2005
<i>Helicoverpa armigera</i> and <i>H. assulta</i>	Insecta: Lepidoptera	Sterility	Experimental crosses	Only in one direction		Z-autosome interactions	Zhao et al. 2007
<i>Heliconius melpomene</i> and <i>H. heurippa</i>	Insecta: Lepidoptera	Sterility	Experimental crosses	Only in one direction		Dominance	Salazar et al. 2005
<i>Heliconius melpomene melpomene</i> and <i>H. m. rosina</i>	Insecta: Lepidoptera	Sterility	Experimental crosses	Yes		Dominance	Jiggins et al. 2001
<i>Heliconius melpomene</i> and <i>H. cydno</i>	Insecta: Lepidoptera	Sterility (but not inviability)	Experimental crosses	Yes		Dominance	Naisbit et al. 2002
5 populations of <i>Tigriopus californicus</i>	Crustacea	Sterility	Experimental crosses	No (B)	No sexual selection on males		Willett 2008
<i>Viviparus ater</i> and <i>V. contectus</i>	Gastropoda	Inviability (but not sterility)	Experimental crosses	Yes			Trub and Ribi 1997
<i>Pristionchus aerivorus</i> and <i>P. pseudaeivorus</i>	Nematoda	Inviability	Experimental crosses	Yes			Herrmann et al. 2006