

Table S1. Review of the evidence for paternity success trade-offs in male (pre-copulatory) phenotype in birds. Only those studies that report *simultaneously* but also give *independent measures* of the effects of a given phenotype in a male's within- and extrapair paternity success are included. Incidence of extrapair paternity, EPP, is the percentage of broods with at least one extrapair young observed in the species (obtained from [2], when populations levels were not provided in the cited reference). Antagonistic selection occurs when the same phenotypic trait is under opposing directional selection with respect to extrapair and within-pair paternity success.

Species	Male phenotypic trait	Shape of Selection		Reference	EPP
		Extrapair success	Within-pair success		
<i>Carpodacus erythrinus</i>	Plumage	Positive	None	[3]	32%
<i>Carpodacus mexicanus</i>	Song	Positive	Positive	[4]	14%
<i>Cyanistes caeruleus</i>	Song, Age	Positive	Positive	[5]	40%
	Plumage (manipulated)	Positive	None	[6]	
	Plumage (natural)	Negative	Positive	[7]	
<i>Emberiza schoeniclus</i>	Exploratory behavior, Age	Positive	None	[8]	64%
<i>Ficedula albicollis</i>	Plumage	Positive	Positive	[9]	33%
<i>Ficedula hypoleuca</i>	Plumage (UV)	None	Positive	[10]	13%
<i>Geothlypis trichas</i>	Plumage, Age	Positive	None	[11]	49%
	Song, Condition	None	None		
<i>Hirundo rustica</i>	Tail length (natural & artificial)	Positive	Positive	[12]	n/a
<i>Icterus galbula bullockii</i>	Age	Positive	Positive	[13]	46%
	Condition	None	None		
<i>Junco hyemalis</i>	Testosterone levels (artificial)	Stabilizing	Positive	[14]	n/a
<i>Luscinia svecica</i>	Plumage	Positive or None	Positive	[15]	51%
	Size, Condition	None	None		
	Age	Positive	None		
<i>Malurus cyaneus</i>	Plumage molt date	Positive	None	[16]	95%
	Sperm morphology	Negative	Positive	This study	
<i>Malurus melanocephalus</i>	Plumage	Positive	None	[17]	51%
<i>Pachycephala pectoralis</i>	Song	Positive	Positive	[18]	23%
	Plumage	Positive	None		
<i>Periparus ater</i>	Age	Positive	Positive	[19]	67%
<i>Phylloscopus fuscatus</i>	Song	Positive	Positive	[20]	59%
<i>Progne subis</i>	Age	Positive	Positive	[21]	n/a
<i>Promerops cafer</i>	Tail length	Positive	Negative	[22]	71%
<i>Setophaga ruticilla</i>	Age	Positive	Positive	[23]	59%
<i>Tyrannus tyrannus</i>	Song, Size	Positive	Positive	[24]	61%
<i>Wilsonia citrina</i>	Age, Size	None	None	[25]	35%
	Song	Positive	Positive (indirect)	[26]	
	Plumage	None	None		

References

- [2] Griffith SC, Owens IPF, Thuman KA (2002) Extra pair paternity in birds: a review of interspecific variation and adaptive function. *Mol Ecol* 11: 2195–2212.
- [3] Albrecht T, Vinkler M, Schnitzer J, Polakova R, Munclinger P, et al. (2009) Extra-pair fertilizations contribute to selection on secondary male ornamentation in a socially monogamous passerine. *J Evol Biol* 22: 2020–2030.
- [4] Mennill D, Badyaev A, Jonart L, Hill G (2006) Male house finches with elaborate songs have higher reproductive performance. *Ethology* 112: 174–180.
- [5] Kempenaers B, Verheyren GR, Dhondt AA (1997) Extrapair paternity in the blue tit (*Parus caeruleus*): female choice, male characteristics, and offspring quality. *Behav Ecol* 8: 481–492.
- [6] Delhey K, Peters A, Kempenaers B (2007) Cosmetic coloration in birds: Occurrence, function, and evolution. *Am Nat* 169: S145–S158.
- [7] Delhey K, Johnsen A, Peters A, Andersson S, Kempenaers B (2003) Paternity analysis reveals opposing selection pressures on crown coloration in the blue tit (*Parus caeruleus*). *Proc R Soc Lond B* 270: 2057–2063.
- [8] Kleven O, Marthinsen G, Lifjeld J (2006) Male extraterritorial forays, age and paternity in the socially monogamous reed bunting (*Emberiza schoeniclus*). *J Ornithol* 147: 468–473.
- [9] Sheldon B, Ellegren H (1999) Sexual selection resulting from extrapair paternity in collared flycatchers. *Anim Behav* 57: 285–298.
- [10] Lehtonen PK, Primmer CR, Laaksonen T (2009) Different traits affect gain of extrapair paternity and loss of paternity in the pied flycatcher, *Ficedula hypoleuca*. *Anim Behav* 77: 1103–1110.
- [11] Thusius K, Peterson K, Dunn P, Whittingham L (2001) Male mask size is correlated with mating success in the common yellowthroat. *Anim Behav* 62: 435–446.
- [12] Saino N, Primmer C, Ellegren H, Møller A (1997) An experimental study of paternity and tail ornamentation in the barn swallow (*Hirundo rustica*). *Evolution* 51: 562–570.
- [13] Richardson D, Burke T (1999) Extra-pair paternity in relation to male age in Bullock's orioles. *Mol Ecol* 8: 2115–2126.
- [14] McGlothlin JW, Whittaker DJ, Schrock SE, Gerlach NM, Jawor JM, et al. (2010) Natural selection on testosterone production in a wild songbird population. *Am Nat* 175: 687–701.
- [15] Johnsen A, Lifjeld JT, Andersson S, Ornborg J, Amundsen T (2001) Male characteristics and fertilisation success in bluethroats. *Behaviour* 138: 1371–1390.
- [16] Dunn PO, Cockburn A (1999) Extrapair mate choice and honest signaling in cooperatively breeding superb fairy-wrens. *Evolution* 53: 938–946.
- [17] Webster MS, Varian CW, Karubian J (2008) Plumage color and reproduction in the red-backed fairy-wren: Why be a dull breeder? *Behav Ecol* 19: 517–524.
- [18] Dongen W, Mulder R (2009) Multiple ornamentation, female breeding synchrony, and extra-pair mating success of golden whistlers (*Pachycephala pectoralis*). *J Ornithol* 150: 607–620.
- [19] Schmoll T, Mund V, Dietrich-Bischoff V, Winkel W, Lubjuhn T (2007) Male age predicts extrapair and total fertilization success in the socially monogamous coal tit. *Behav Ecol* 18: 1073–1081.
- [20] Forstmeier W (2002) Factors contributing to male mating success in the polygynous dusky warbler (*Phylloscopus fuscatus*). *Behaviour* 139: 1361–1381.
- [21] Wagner R, Schug M, Morton E (1996) Condition dependent control of paternity by female purple martins: Implications for coloniality. *Behav Ecol Sociobiol* 38: 379–389.
- [22] McFarlane ML, Evans MR, Feldheim KA, Preault M, Bowie RC, et al. (2010) Long tails matter in sugarbirds—positively for extrapair but negatively for within-pair fertilization success. *Behav Ecol* 21: 26–32.
- [23] Perreault S, Lemon R, Kuhnlein U (1997) Patterns and correlates of extrapair paternity in American redstarts (*Setophaga ruticilla*). *Behav Ecol* 8: 612–621.
- [24] Dolan AC, Murphy MT, Redmond LJ, Sexton K, Duffield D (2007) Extrapair paternity and the opportunity for sexual selection in a socially monogamous passerine. *Behav Ecol* 18: 985–993.
- [25] Stutchbury B, PIPER W, Neudorf D, Tarof S, Rhymer J, et al. (1997) Correlates of extra-pair fertilization success in hooded warblers. *Behav Ecol Sociobiol* 40: 119–126.
- [26] Chiver I, Stutchbury B, Morton E (2008) Do male plumage and song characteristics influence female off-territory forays and paternity in the hooded warbler? *Behav Ecol Sociobiol* 62: 1981–1990.