README

Author: James D. M. Tolliver

Journal: Am. Nat. Submission

Submission status: *in revision*

Current paper title: Fitness benefits from co-display favor subdominant male-male partnerships between phenotypes

Authors of ms: James D. M. Tolliver, Krisztina Kupán, David B. Lank, Susanne Schindler, and Clemens Küpper

Last updated: 26 October 2021

This code was written in MatLab R2017a, © 1994-2021 The MathWorks, Inc. All the code was written for the extraction of data from published sources or for calculating predictions based on the model Tolliver *et al.*'s (*in revision*) of resident/satellite co-display dynamics.

The code is in three parts: the main text code, the supplementary code, and the Rcode.

The figures with model inputs and predictions presented in the main text and supplemental text can be produced with the plot scripts whereas all functions presented in the main text and supplemental material are in individual function scripts. These functions and scripts act as an entire package for the paper and should be placed in the same file location before running the scrips. Each function and script has its own documentation and description. However, table 1Code summarizes the elements within the model and the code.

Table 1Code. Model elements from Tolliver *et al.* (*in revision*) (Elements) and their associated notation in the code (Element in code), how they appear in the code (Type), and their associated function name with in the code (Function).

Element	Element in code	Type	Function
r	r	Input variable	--
L	L	Input variable	--
T	444	Constant within a function	--
F^{Lek}	F_Lek	Function	Total_cops_on_lek
B	B	Function	Skew_of_lek
$\hat{B}$	B_Hat	Function	Norm_skew_of_lek
K_r	K_r	Parameter estimated within a function	--
h	h	Input variable	--
H_r^h	H_h_r	Parameter estimated within a function	--
F_r^{Res}	F_Res_r	Function	Single_res_cops
F^{Sat}	F_s	Constant within a function	--
$F^{Res\ total}$	F_Res_total	Function	Total_res_cops
$F^{Sat+Res}$	F_SatandRes	Function	Co_dis_benefit
$F_r^{Display}$	F_Dis_r	Parameter estimated within a function	Total_cops_co_dis
D_r	D_r	Function	Dis_risk
M^{Sat}	M_Sat	Input variable	--
M_r^{Res}	M_Res_r	Function	Mono_coeff
C_r^{Res}	C_Res_r	Function	Res_payoffs
C_r^{Sat}	C_Sat_r	Function	Sat_payoffs
G_r^{Res}	G_Res_r	Function	Res_reward
G_r^{Sat}	G_Sat_r	Function	Sat_reward
$C_r^{Res+Res\ choice}$	C_Res_r_ch	Function	Res_payoffs_res_choice
$C_r^{Sat++Res\ choice}$	C_Sat_r_ch	Function	Sat_payoffs_res_choice