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Electronic Supplementary Information

Migration behaviour of commercial monarchs reared outdoors and wild-derived monarchs reared indoors

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Supplemental Files

1. TengerTrolander_Video_S1.mp4 is a 1-minute clip of individual S101, a wild type reared in a glass top greenhouse in autumn changing directions repeatedly in a flight simulator.

2. TengerTrolander_Video_S2.mp4 is a 1-minute clip of individual E101, a wild type reared outdoors in autumn flying south consistently in a flight simulator.

3. TengerTrolander_Data_S1.xlsx contains orientation data for all monarchs, organized by population and rearing condition.

Supplemental Tables

Table S1. Number of total flight trials and successful flight tests for all tested monarchs (N=74) by population of origin (wild type or commercial) and treatment (outdoor or indoor-reared). Greyed areas indicate individuals with successful flight tests and white those that never flew. Laboratory reared individual are S123, S124, S122, and S126.

Wild type Outdoor			Wild type Indoor			Commercial Outdoor		
ID	Trials	Successful flights	ID	Trials	Successful flights	ID	Trials	Successful flights
E104	12	2	S101	8	6	B102	9	3
E108	11	4	S123	4	3	B103	9	2
E110	10	1	S113	3	3	B100	8	2
E101	9	7	S111	3	2	B108	8	1
E100	9	0	S115	3	1	B105	7	5
E107	9	0	S118	3	1	B142	7	5
E103	8	5	S104	3	0	B146	7	3
E111	8	2	S124	3	0	B144	7	2
E106	8	1	S117	2	2	B133	6	4
E105	8	0	S016	2	1	B139	6	0
E113	8	0	S110	2	1	B143	6	0
E109	7	2	S112	2	1	B111	5	3
E102	6	0	S119	2	1	B124	5	3
E112	4	0	S122	2	1	B134	5	1
E114	2	0	S107	2	0	B138	5	1
			S108	2	0	B140	5	1
			S109	2	0	B141	5	1
			S105	1	1	B145	5	0
			S114	1	1	B104	4	4
			S126	1	1	B110	4	4
			S103	1	0	B106	4	3
			S116	1	0	B115	4	2
						B117	4	2
						B128	4	1
						B132	4	1
						B136	4	1
						B109	3	3
						B101	3	0
						B130	3	0
						B147	3	0
						B126	2	1
						B129	2	1
						B127	2	0
						B122	1	1
						B125	1	0
						B131	1	0
						B137	1	0

Table S2. Flight test data for all individuals from wild-type group reared indoors. Individual (ID), mean vector magnitude (R), mean vector (Direction Flown), minimum time in hours spent outdoors post tethering and rest period (Time outdoors), age in days, and the date of the flight test (Flight date). Data is organized by increasing amount of time spent outdoors. Data are color coded by their direction flown, S stands for south and N for north.

ID	R	Direction Flown		Time outdoors (hrs)	Age (days)	Flight Date
S111	0.83	191.11	S	1.03	11	10/27/2019
S115	0.96	15.61	N	1.08	10	10/27/2019
S113	0.99	161.2	S	1.37	10	10/27/2019
S114	1	210.5	S	1.38	10	10/27/2019
S110	0.98	77.06	N	1.67	11	10/27/2019
S117	0.74	193.86	S	1.82	10	10/27/2019
S105	0.64	212.53	S	2.07	12	10/27/2019
S123	0.67	245.92	S	2.37	12	10/27/2019
S101	0.42	123.5	S	3.95	13	10/7/2019
S123	0.99	237.85	S	5.28	13	10/28/2019
S111	0.4	194.32	S	6.82	19	11/4/2019
S113	0.88	325.12	N	6.98	18	11/4/2019
S117	0.91	50.12	N	7.1	18	11/4/2019
S118	0.22	115.32	S	7.3	17	11/4/2019
S123	0.99	293.7	N	7.33	20	11/4/2019
S112	0.93	230.58	S	7.53	18	11/4/2019
S106	0.5	54.2	N	7.68	20	11/4/2019
S126	0.46	30.18	N	7.87	7	11/4/2019
S119	0.96	221.65	S	7.95	17	11/4/2019
S122	0.99	330.5	N	8.7	20	11/4/2019
S113	1	334.61	N	10	20	11/6/2019
S101	1	16.47	N	11.53	15	10/9/2019
S101	0.77	326.5	N	14.7	20	10/14/2019
S101	0.14	171.01	S	21.52	33	10/27/2019
S101	0.55	128.5	S	22.98	34	10/28/2019
S101	0.57	231.01	S	26.13	41	11/4/2019