

# SUPPLEMENTARY MATERIAL

## Differences in foraging strategies and morphology of five warbler species (Parulidae) in a tropical mangrove forest

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Supplementary Table 1

Definition of substrates and foraging maneuvers employed by the five warbler species (*Setophaga p. erithachorides*, *S. petechia*, *Protonotaria citrea*, *Parkesia noveboracensis*, and *Leothlypis peregrina*) in the mangrove forest.

Substrates	Definition
Ground	Bare soil and litter scattered on the ground
Roots	Aerial roots of <i>Rhizophora</i> trees, exposed roots of other species, and pneumatophores of <i>Avicennia germinans</i>
Trunk [trk]	Main stem of trees
Branches 1 [br.1]	Leafless branches with diameter > 3cm
Branches 2 [br.2]	Leafless branches with diameter between 2 and 3 cm
Branches 3 [br.3]	Leafless branches with diameter between 1 and 2 cm
Twigs	Thin branches with leaves
Leaves	Full grown and young leaves
Flowers	Buds, full open and decay flowers
Maneuvers	
Screen [scr]	The prey is pursued and attacked in a continuous flight.
Flush-pursue on vegetation [fpv]	The bird flushes the prey from a substrate and chases it.
Flush-pursue on the ground [fpg]	Similar to the previous maneuver, but the bird is foraging on the ground.
Sally-outward-hover [soh]	The bird sallies horizontally and hovers at the target substrate at the end of the sally.
Sally-upward-hover [suh]	The bird sallies upwards (angle between 45 and 90°) and hovers at the target substrate at the end of the sally.
Sally-outward-strike [sos]	The bird attacks the prey in the air with a direct, horizontal, flight.
Sally-upward-strike [sus]	The bird attacks the prey in the air with an upward flight (45 to 90°).
Sally-upward-strike-ground [sug]	Similar to the previous maneuver, but the bird departs from the ground.

Sally-pounce [spo]	The bird lands briefly at the end of the sally to attack a prey on a substrate.
Glean on the ground [gog]	The bird pick (or attack) prey from the ground or litter.
Glean on vegetation [gov]	The bird pick (or attack) prey from nearby leaves, twigs, branches or trunks.
Probe in bark [pib]	The bird inserts its bill into bark cracks, searching for prey.
Probe in rolled leaves [prl]	Similar to the previous maneuver, but the bird inserts its bill into rolled (usually dead) leaves.
Hang-upside-down [hud]	To hang, belly-up, on the perch to reach a prey

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Supplementary Table 2

Percentage of time that each species foraged on each substrate. Acronyms for substrates are included in TABLE A1. Species: S.p.e.\* – *Setophaga petechia erithachorides* in absence of migrants; S.p.e. ° – *S. p. erithachorides* when migrants present; S.pe. – *S. petechia*; P.cit – *Protonotaria citrea*; P.nov- *Parkesia noveboracensis*; L.pe – *Leiothlypis peregrina*.

species	Substrates								
	trk	br.1	br.2	br.3	twigs	leaves	roots	ground	flowers
S.p.e.*	0.23	0.82	2.24	5.41	41.98	47.45	0.47	1.39	0.00
S.p.er.°	0.10	1.31	1.00	2.83	45.78	45.33	0.63	2.94	0.08
S.pet	0.00	0.61	0.72	2.19	37.58	58.08	0.69	0.02	0.11
P.cit	0.34	0.71	1.30	3.12	18.65	74.85	0.23	0.77	0.04
P.nov	2.70	0.27	0.11	0.26	0.91	3.73	0.03	91.99	0.00
L.per	0.00	0.00	0.18	0.63	16.08	80.53	0.00	0.13	2.46

TABLE A3

Percentage of time that each species used each foraging maneuver. Acronyms for maneuvers are included in TABLE A1. Species: S.p.e.\* – *Setophaga petechia erithachorides* in absence of migrants; S.p.e. ° – *S. p. erithachorides* when migrants present; S.pe. – *S. petechia*; P.cit – *Protonotaria citrea*; P.nov- *Parkesia noveboracensis*; L.pe – *Leiothlypis peregrina*.

Species	Maneuvers													
	scr	fpv	fpg	soh	suh	sos	sus	sug	spo	gog	gov	pib	prl	hud
S.p.e.*	0.0	0.0	0.0	0.1	0.2	0.1	0.0		0.1		96.6	0.1	0.9	0.3
S.p.e. °	3	0	0	7	0	3	6	0.00	3	1.24	0	8	0	6
S.pe	0.0	0.0	0.0	0.2	0.4	0.2	0.2		0.0		92.8	0.0	0.6	0.5
P.cit	0	5	1	1	1	1	0	0.00	5	4.69	6	7	9	4
P.nov	0.0	0.0	0.0	0.2	0.3	0.2	0.2		0.0		97.5	0.0	0.4	0.3
L.pe	0	0	0	6	1	2	1	0.00	4	0.59	9	5	0	2
	0.0	0.0	0.0	0.0	0.1	0.1	0.0		0.0		92.9	3.1	0.9	0.3
	0	0	0	8	6	0	4	0.01	1	2.25	4	0	2	7
	0.4	0.0	0.0	0.4	0.0	0.1	0.0		0.0	89.6		0.0	0.0	0.0
	2	0	0	2	0	1	7	0.00	0	1	9.36	0	0	0
	0.0	0.0	0.0	0.1	0.0	0.0	0.0		0.0		92.7	0.0	6.6	0.2
	0	0	0	8	6	9	1	0.00	0	0.00	2	4	2	8