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.

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| Substrates | Definition |
| Ground | Bare soil and litter scattered on the ground |
| Roots | Aerial roots of *Rhizophora* trees, exposed roots of other species, and pneumatophores of *Avicennia germinans*  |
| 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 |

Supplementary Table 2

Percentage of time that each species foraged on each substrate. Acronymous 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.*

|  |  |
| --- | --- |
|  | Substrates |
| species | 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. Acronymous 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.*

|  |  |
| --- | --- |
|  | Maneuvers |
| Species | scr | fpv | fpg | soh | suh | sos | sus | sug | spo | gog | gov | pib | prl | hud |
| S.p.e.\* | 0.03 | 0.00 | 0.00 | 0.17 | 0.20 | 0.13 | 0.06 | 0.00 | 0.13 | 1.24 | 96.60 | 0.18 | 0.90 | 0.36 |
| S.p.e. ° | 0.00 | 0.05 | 0.01 | 0.21 | 0.41 | 0.21 | 0.20 | 0.00 | 0.05 | 4.69 | 92.86 | 0.07 | 0.69 | 0.54 |
| S.pe | 0.00 | 0.00 | 0.00 | 0.26 | 0.31 | 0.22 | 0.21 | 0.00 | 0.04 | 0.59 | 97.59 | 0.05 | 0.40 | 0.32 |
| P.cit | 0.00 | 0.00 | 0.00 | 0.08 | 0.16 | 0.10 | 0.04 | 0.01 | 0.01 | 2.25 | 92.94 | 3.10 | 0.92 | 0.37 |
| P.nov | 0.42 | 0.00 | 0.00 | 0.42 | 0.00 | 0.11 | 0.07 | 0.00 | 0.00 | 89.61 | 9.36 | 0.00 | 0.00 | 0.00 |
| L.pe | 0.00 | 0.00 | 0.00 | 0.18 | 0.06 | 0.09 | 0.01 | 0.00 | 0.00 | 0.00 | 92.72 | 0.04 | 6.62 | 0.28 |