

Coroller-Chouraki *et al.* 2026. Parasitism by, species composition, morphometry, and parasitoidism of *Protocalliphora* bird blowflies (Diptera: Calliphoridae) in Quebec's farmlands: a 16-year dataset. The Canadian Entomologist.

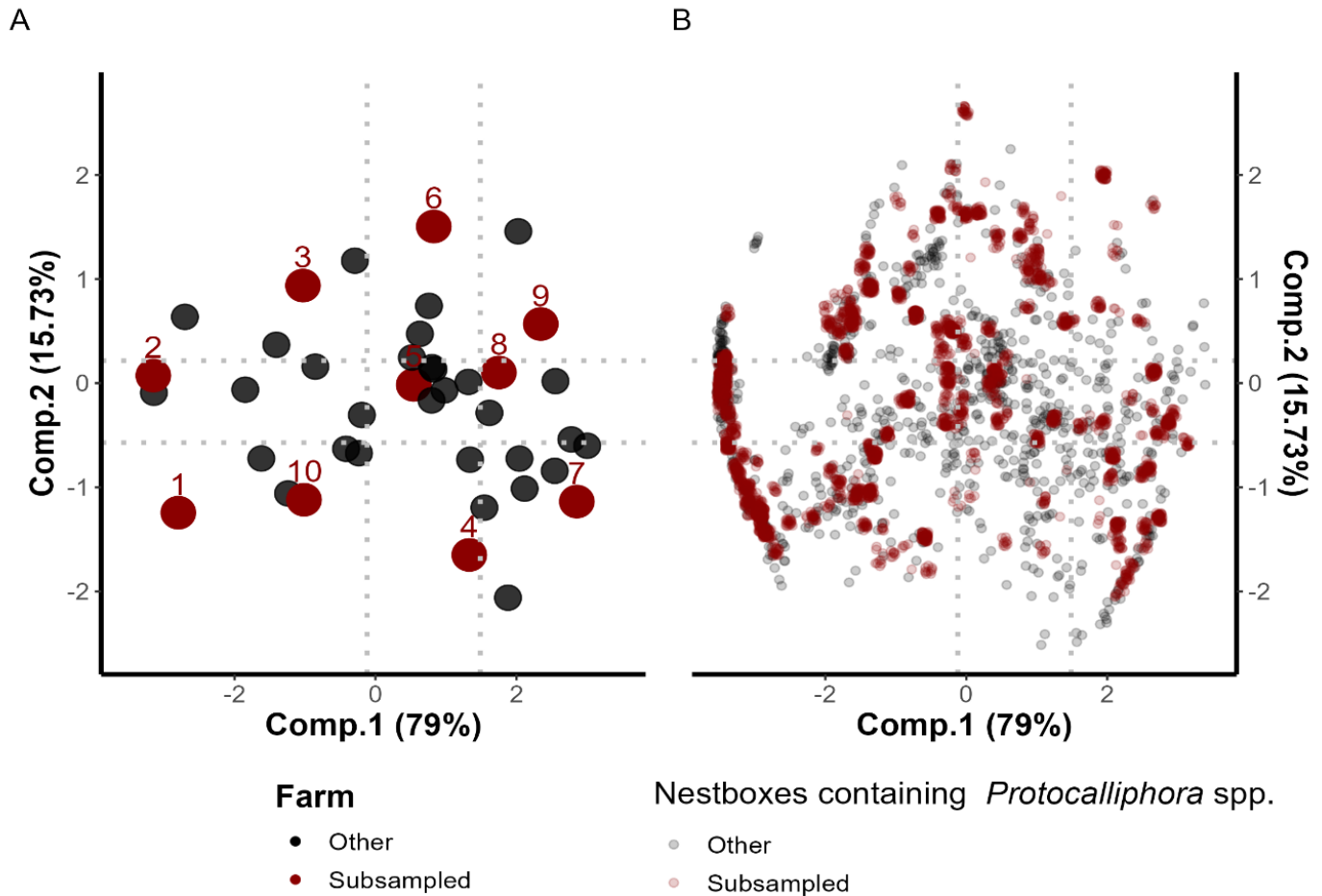
26 **Supplementary material, File S2 – agricultural intensification and random** 27 **sampling of *Protocalliphora*-infested nest boxes**

28 We quantified the landscape habitat composition within a 500-m radius surrounding each
29 tree swallow, *Tachycineta bicolor*, nest box by combining *in situ* habitat characterisation with
30 high-resolution orthophotos (1:40 000; QGIS, <https://qgis.org/>). Habitat mapping was conducted
31 at the end of each breeding season between 2006 and 2019 and included four major land-cover
32 categories: Forest, Corn/Soybean, Other Cereals (wheat, oat, barley), and Pasture/Forage (hay,
33 alfalfa, clover). Orthophotos were used to delineate field and forest boundaries, following the
34 procedures outlined in Garrett *et al.* (2022b) and Powell *et al.* (2024). Streams and water bodies
35 covered an average less than 1% of the area surrounding nest boxes (Garrett *et al.* 2022c) and
36 were excluded from analyses.

37 To characterise the average landscape habitat composition of each farm, we performed a
38 robust compositional principal component analysis (rPCA) using the *robCompositions* R
39 package (Templ *et al.* 2011) on the annual relative cover of the four habitat types within each
40 500-m buffer (2006–2019). The first component (Comp. 1) explained 79% of the total variance
41 and was positively correlated with Corn/Soybean and negatively with Forage and Forest cover,
42 representing a gradient of agricultural intensity. The second component (Comp. 2) explained
43 16% of the variance and was positively associated with tree cover and negatively with Forage,
44 representing a tree–forage gradient. As *in situ* characterisation of crops could not be performed in
45 2004 and 2005, Comp. 1 and Comp. 2 values for those years were estimated by averaging the
46 corresponding 2006–2008 scores for each nest box. This approach was justified by the relatively
47 stable landscape configuration observed over time within farms, although interannual changes in

48 field boundaries and crop rotations were not negligible and can contribute meaningfully to local
49 habitat heterogeneity.

50 To select a representative subset of nests infested by *Protocalliphora* spp. for further
51 analyses of their puparia, we first stratified the full dataset according to the 33% and 66%
52 quantiles of both Comp. 1 and Comp. 2 scores, thereby defining nine distinct classes of
53 “agricultural context” (e.g., *Low Comp.1 × Low Comp.2*, *Mid Comp.1 × High Comp.2*, etc.; Fig.
54 S2A). One farm was then randomly selected within each of these nine agricultural-context
55 classes before an additional farm was randomly chosen among the remaining ones, for a total of
56 10 farms. Because each farm contained 10 nest boxes spaced approximately 50 m apart, the
57 landscape habitat composition surrounding each box varied slightly within farms. Moreover, as
58 field configuration and crop composition could shift from year to year due to crop rotations and
59 local management practices, randomly selecting two infested nests (when available) per farm
60 allowed for substantial landscape heterogeneity across the time series (Fig. S2B). To ensure
61 adequate representation across years and to maintain statistical robustness, we sometimes had to
62 randomly select additional farms. We randomly selected up to two *Protocalliphora*-infested nests
63 from these additional farms and stopped as soon as we could process at least 100 *Protocalliphora*
64 spp. puparia on each year. A total of 263 nests were subsampled across farms and years,
65 representing a broad spectrum of agricultural intensity and landscape structural complexity
66 among the 1227 nests found to be infested by *Protocalliphora* spp. between 2004 and 2019 in
67 our study system.



68 **Figure S2. A**, Stratification of the 40 farms across the agricultural landscape gradient
69 defined by a robust compositional principal component analysis of habitat types within 500 m of
70 nest boxes. Grey dashed lines mark the 33% and 66% quantiles of Comp. 1 and Comp. 2 scores,
71 defining nine classes of agricultural context. Among the 40 farms (black dots), 10 (red dots) were
72 randomly selected across these classes, with up to two *Protocalliphora*-infested nests examined
73 per farm and year. Additional randomly selected farms and nests (≤ 2 nests) were sequentially
74 added to ensure that at least 100 puparia could be processed on each year, increasing coverage of
75 landscape contexts. **B**, Distribution of the 263 nests (red dots) selected among all 1227 nests
76 infested by *Protocalliphora* spp. (grey dots) between 2004 and 2019.

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78 **REFERENCES**

79 For the bibliographic information of the references cited in Supplementary material,

80 File S2, please see the references in the main paper.

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