

Prevalence and Diversity of Avian Haemosporidians May Vary with Anthropogenic Disturbance in Tropical Habitats in Myanmar

Jaime Muriel ^{1,#,*}, Alfonso Marzal ^{2,#}, Sergio Magallanes ², Luz García-Longoria ^{2,3}, Marcela Suarez-Rubio ⁴, Paul J. J. Bates ^{4,5}, Htet Htet Lin ⁶, Aye Nyein Soe ⁶, Khin Swe Oo ⁷, Aung Aung Aye ⁸, Naw Dolly Wilbur ⁹, Ni Ni Win ⁹, Yupa Tin Soe ⁹, Khaing Khin Linn ⁹ and Swen C. Renner ¹⁰

Supplementary Materials:

Classification of land-use types

In each locality, four general habitat types representing four levels of urbanization have been established following the procedures of Suarez-Rubio et al. (2016): (1) "Downtown City" or DC which is downtown at the city centre with the highest human population; (2) "Paddy field" or PF which is an agricultural area just on the margins of each city; (3) "University Campus" or UC is within each city the university campus complex; and (4) "M Hill" or MH, which is a hill site close to each city.

Downtown habitats are located at the city center and are highly developed (>70% impervious surface), and have a very high housing and human population density. Trees, mostly native species, are limited to few rather small patches and along streets. University Campus are located at the margin of the city center. It is moderately developed (30-40%), have relatively many large trees, and partially dense understory. Some parts are covered with grass or bare soils. Hill habitats are located outside of the city, and are sparsely developed (<30%), and are covered with forests that consist mainly of scrubs and thorn bushes of up to 15 m height. Buildings consist of few pagodas/stupas and the stairways. In addition, there are few houses and inhabitants. Paddy Fields at the fringes of the cities are rural agricultural areas with no houses and some larger trees. The agricultural area is characterized by a patchwork of rice Paddy Fields and plantations, although rice is in all three cases the dominant crop in the area.

The characteristics of habitat and general structure within each of the four areas and between the three cities are homogenous as to reduce any other potential confounding effects on the birds.

- Suarez-Rubio M et al. (2016) Nonbreeding Bird Communities Along an Urban-Rural Gradient of a Tropical City in Central Myanmar *Tropical Conservation Science* 9:1-9 doi:10.1177/1940082916675961

Supplementary Table S1. Geographical coordinates (decimal) of the different sampling points in each land use area grouped by locality. In addition, the total number of birds sampled and the number of infected birds are shown per each sampling point.

| Locality | Land-use type | Latitude | Longitude | N total | N infected |
|------------|-------------------|-----------|-----------|---------|------------|
| Mandalay | Downtown | 21.988275 | 96.076456 | 14 | 0 |
| Mandalay | University campus | 21.956566 | 96.093230 | 9 | 3 |
| Mandalay | Paddy fields | 21.960759 | 96.172929 | 11 | 3 |
| Mandalay | Hill | 22.014704 | 96.111387 | 23 | 3 |
| Mawlamyine | Downtown | 16.478917 | 97.627245 | 1 | 0 |
| Mawlamyine | University campus | 16.437862 | 97.651014 | 15 | 0 |
| Mawlamyine | Paddy fields | 16.485742 | 97.665363 | 6 | 3 |
| Mawlamyine | Hill | 16.413040 | 97.680100 | 16 | 0 |
| Myeik | Downtown | 12.440894 | 98.598614 | 1 | 1 |
| Myeik | University campus | 12.467465 | 98.609946 | 21 | 2 |
| Myeik | Paddy fields | 12.487662 | 98.628605 | 7 | 1 |
| Myeik | Hill | 12.452348 | 98.573263 | 22 | 3 |

Supplementary Table S2. Tukey post-hoc tests showing differences in haemosporidian prevalence between localities and land-use types.

| | | Estimate \pm Std. Error | z value | Pr(> z) |
|------------|-----------------------|---------------------------|---------|----------|
| Localities | Mawlamyine - Mandalay | -0.8224 \pm 0.7241 | -1.136 | 0.4895 |
| | Myeik - Mandalay | -1.5380 \pm 0.6421 | -2.395 | 0.0433 |
| | Myeik - Mawlamyine | -0.7156 \pm 0.8034 | -0.891 | 0.6439 |
| Land-uses | Paddy field - Hill | 1.6776 \pm 0.7488 | 2.241 | 0.0640 |
| | Urban - Hill | 0.3494 \pm 0.7374 | 0.474 | 0.8831 |
| | Urban - Paddy field | -1.3283 \pm 0.6217 | -2.136 | 0.0819 |