Longevity estimates of urban birds from Lima, Peru

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En este estudio presento datos de longevidad de 13 especies de aves (12 paseriformes y un falconiforme) que habitan en zonas urbanas de la ciudad de Lima, Perú. Estas aves son típicas del bioma Desierto Pacífico. La longevidad fue calculada a través de anillamiento y observaciones continuas durante 15 años (noviembre 1995–julio 2010) de monitoreo de las aves en un parque urbano. Los casos del Saltapalito *Volatinia jacarina* (diez años, seis meses, 27 días), Turtupilín *Pyrocephalus rubinus* (diez años, cuatro meses, 14 días), Mielero *Coereba flaveola* (nueve años, siete meses, 12 días) y Gorrión Americano *Zonotrichia capensis* (ocho años, un mes, 18 días) son récords de longevidad para estas especies. Los parques urbanos pueden ser centros de entrenamiento para monitoreo de aves, capacitando ornitólogos profesionales y amateur. Con los datos de este monitoreo, se ha producido información valiosa de la historia natural de las aves urbanas.

Is the sparrow singing in the garden the same one that was singing last year? Or maybe ten years ago? It would be possible to answer these questions if we could identify the individual sparrow. This type of question could drive avian longevity research. We currently know that birds can live longer than other similar-sized vertebrates[8,12] and that their longevity could be related to metabolism, genetics or other factors[7,15]. Most longevity information on wild birds comes from long-term monitoring studies involving marking and identification of colour-banded individuals, mainly in the Nearctic and Palearctic[9,21,23,27]. In the Neotropics, data are scarce and rather dispersed[11,24]. Yet, according to Scholer *et al.*[24] (and references cited therein) most Neotropical passerines could live 5–10 years.

Usually, bird-banding stations are sited in natural areas subject to minimal or reduced human disturbance. However, large cities are not devoid of birds as several species have adapted to urban parks and gardens[3]. Large cities are expanding in biodiversity hotspots[1], and these anthropogenic areas could be used to implement bird-monitoring projects and to further research and conservation. Lima, the capital of Peru, is a megapolis that faces several environmental problems and, at the same time, harbours an avifauna typical of the Pacific Desert biome[4,6,10]. Here, I present longevity data for some urban species obtained via mark-recapture efforts during a monitoring programme in one of the city's urban parks.

Methods

Between November 1995 and July 2010, I monitored birds in an urban park within the Lima metropolitan area, Peru, using binoculars and mist-nets. This work was part of an initiative of Grupo Aves del Perú (GAP) to increase awareness of bird conservation among the general public using urban birds. The study area was Gastañeta park in the Barrio Médico neighbourhood, Surquillo district, southern Lima (0.5 ha; 12º07.01'S 77º00.90'W). Climate is dry and warm most of the year, with 100% humidity in winter. Mean daily temperatures range between 15ºC and 26ºC[4]. Vegetation is a mosaic of grassland, bushes and trees, most of which are exotic species. The most abundant woody plants are *Inga fuellei* and *Tipuana tipu* (Fabaceae), *Lantana camara* (Verbenaceae) and *Punica granatum* (Lythraceae)[4].

To mark birds, I set up 7–10 mist-nets (36 mm mesh, 1.8 m tall) around bushy vegetation, once per month, from November 1995 to July 2010. The nets were distributed in places with densest plant cover. Mist-nets were opened during 06h00–12h00, for a total mist-netting effort of 4,724.74 net-hours (4–107 net-hours / month[5]). Most birds mist-netted were identified with aluminium numbered bands and a unique combination of plastic colour bands (Table 1). Some individuals were not colour-banded because appropriately sized bands were unavailable. My assistants and I checked the mist-nets every 30 minutes and kept watch for possible disturbances that could interfere with trapping (e.g., too many people in close proximity or the presence of domesticated animals potentially disturbing the birds). Although we endeavoured to mitigate disturbance, mist-netting was sometimes suspended.

I adapted the protocol of Ralph *et al.*[19] for bird counts and captures. I counted all birds inside the park using a 100-m transect that crossed it from north to south. This census method proved to be more efficient for bird surveys in urban areas of Lima[20]. Counts were undertaken once per week (with some interruptions), and usually started at dawn (06h00) and lasted 30 minutes. I spent a total of 148 hours conducting bird counts, recording all colour-banded birds. The unique combination of coloured and metal bands permitted me to identify