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**Systematics, morphology, and ecology of pigeons and doves (Aves: Columbidae)
of the Mascarene Islands, with three new species**

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Abstract

The original diversity of the pigeons and doves (Columbidae: *Nesoenas*, *Columba*, *Alectroenas*) of the Mascarene Islands (Mauritius, Réunion, Rodrigues) has been poorly understood. Only two of perhaps as many as ten species are known from skin specimens, whereas the rest are known from old accounts and subfossil remains only. Most accounts, however, do not distinguish between species, so accurate identification is difficult to determine. The introduction of non-native pigeons has further exacerbated the problem and has led to erroneous interpretation. This paper provides a detailed re-analysis of the Mascarene columbid fauna (excluding the large, terrestrial “didines”, the Dodo *Raphus cucullatus* and Solitaire *Pezophaps solitaria*), based partly on newly discovered subfossil remains. Key findings include: a new species of *Alectroenas* from Rodrigues and new species of *Nesoenas* and *Columba* from Mauritius; referral of the problematic species '*Columba*' *rodericana* of Rodrigues to the genus *Nesoenas*; and documentation of new morphological and historical information concerning the extant Pink Pigeon *Nesoenas mayeri* and the extinct Mauritius Blue Pigeon *Alectroenas nitidissima*. The Columbidae comprises the largest avian radiation in the Mascarenes and probably colonised the islands at least four times from Madagascar and SE Asia during low sea level stands.

Key words: Mascarene pigeons and doves, *Nesoenas*, *Alectroenas*, *Columba* extinction, affinities, ecology

Introduction

Pigeons and doves (Columbidae) have populated the large land mass of Madagascar as well as isolated islands and archipelagos throughout the southwestern Indian Ocean, including the Comoros, Mascarenes, and the Seychelles (Goodwin 1983; Gibbs et al. 2001). At least three clades of smaller pigeons reached the Mascarene Islands of Mauritius (20.25° S, 57.5° E), Réunion (21° S, 55.5° E) and Rodrigues (19.75° S, 63.5° E), one of which originated in Madagascar (*Nesoenas* from *Streptopelia*-like turtle doves) and one in Indo-Australia (blue pigeons of the genus *Alectroenas*); the third clade, which is here provisionally included in *Columba* until further physical evidence becomes available (see systematic account below), may have had African or Indo-Australian origins. A fourth colonisation event, from which the endemic didines *Raphus* and *Pezophaps* evolved, was by an ancestral species related to the extant Nicobar pigeon *Caloenas nicobarica* from southeast Asia (Shapiro et al. 2002), but this is open to debate (see Johnson & Clayton 2000).

The Pink Pigeon *Nesoenas mayeri* is the only surviving indigenous Mascarene pigeon and was until recently considered to be critically endangered (see Jones, in Cheke & Hume 2008). Another species, now extinct but represented by three skins, is the Mauritius Blue Pigeon or Dutch Pigeon *Alectroenas nitidissima*, the last having been taken in 1826 (Rothschild 1907; Hachisuka 1953; Greenway 1958, 1967; Fuller 1987, 2000). No skin specimens of other species exist, yet details from contemporary accounts (e.g. Het Tweede Boeck 1601; Dapper 1668; Hoffman 1680 [Grandidier & Grandidier 1905]; Dubois 1674) and the palaeontological record indicate that as many as nine now extinct species of smaller columbids once inhabited the Mascarenes, together with the extant *N. mayeri*. This has resulted in considerable confusion. Introduction of the Rock Dove *Columba livia* (c.1715), Madagascar Turtle Dove *Nesoenas picturata* (c.1770), Spotted Dove *Stigmatopelia chinensis* (c.1781) and Zebra Dove *Geopelia striata* (c. 1770) (Rountree 1952; Cheke 1987; Cheke & Hume 2008) may also have influenced the number of species reported.

This paper synthesizes all available sources of data on Mascarene pigeons, including historical observations and accounts, all available museum specimens, and recently collected palaeontological material. Comparisons presented here, using morphometric data based on osteology, indicate that endemic species of *Nesoenas* and *Alectroe-*