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Source: Bulletin of the British Ornithologists' Club, 140(1) : 96-98

Published By: British Ornithologists' Club

URL: <https://doi.org/10.25226/bboc.v140i1.2020.a10>

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Historical breeding records of Chestnut-bellied Imperial Pigeon *Ducula brenchleyi* in the Ragnar Kreuger collection, with a description of the egg

by Vladislav Marcuk & Donovan de Boer

Received 19 August 2019; revised 2 January 2020; published 19 March 2020

<http://zoobank.org/urn:lsid:zoobank.org:pub:479BBB93-3068-4BAF-9408-596FFB8EF5A8>

Chestnut-bellied Imperial Pigeon *Ducula brenchleyi* is endemic to the Solomon Islands (Baptista *et al.* 2019). The current distribution is apparently restricted to the largest islands in the south of the archipelago: Makira, Malaita and Guadalcanal. Previously the species was recorded *inter alia* on the Three Sister Islands, Ugi (now Uki) and Ulawa. On the latter two, the species was reported as common and abundant, respectively, in 1953 (Cain & Galbraith 1956). However, no recent records are available from any of the satellite islands, suggesting that the species is very rare there or locally extinct (BirdLife International 2019).

Chestnut-bellied Imperial Pigeon inhabits primary lowland and montane forest, and was reported to feed mainly on banyan figs at one study site (Baptista *et al.* 2019). In addition, it is found in degraded forests, and gardens, provided suitable fruiting trees are present (BirdLife International 2019). Recent records reveal that *D. brenchleyi* predominately occupies elevations of 200–700 m—but in the relatively near past it was frequently observed close to sea level (Cain & Galbraith 1956, Baptista *et al.* 2019). Due to wholesale deforestation of coastal areas, the species is now confined to higher altitudes in many regions (Baptista *et al.* 2019). The species is considered globally Vulnerable, and is threatened by hunting and habitat loss (BirdLife International 2019). However, following a ban on firearms in 2003 on Makira hunting pressure on that island has declined significantly (Mittermeier *et al.* 2018).

Virtually nothing is known concerning the breeding biology of *D. brenchleyi* (Mittermeier *et al.* 2018, Baptista *et al.* 2019). A nest was discovered only recently, in December 2016, on the south coast of Makira (Mittermeier *et al.* 2018). It was sited near a beach, in a small rosewood *Pterocarpus indicus* tree and concealed by epiphytes, c.10 m above ground. An adult was attending the nest, indicating that it was active (Mittermeier *et al.* 2018). Linear measurements of the eggs ($n = 3$) discussed below were already provided by Schönwetter (1963), but without data as to precise collecting location, their morphology, clutch size or seasonality. As no further information is currently available concerning the species' breeding biology, here we provide additional information concerning seasonality, clutch size and nests, along with a description of the egg, based on three clutches deposited in the LUOMUS (Finnish Museum of Natural History; MZH).

Historical breeding records

The following is based on three clutches collected by William M. French (1897–1960), a British planter with an intense interest in natural history, especially birds and their eggs. French began developing a coconut plantation on the Three Sisters Islands, after serving in Australia for several years and visiting New Guinea and India (RCS Library n.d.). In 1929 he was invited to collect on behalf of the American Museum of Natural History, New York, in the eastern islands of the Solomons. He assembled a large number of skins and bird eggs during the 1930s, until he was forced to leave the Solomons due to the advance of the Japanese army during World War II, leaving some specimens and personal possessions in a

TABLE 1

Overview of all three clutches of Chestnut-bellied Imperial Pigeon *Ducula brenchleyi* collected by William French on Malaupaina Island (Three Sister Islands) in 1938

Clutch size	Egg size (in mm)	Collection date	Catalogue no. (R. Kreuger catalogue no.)
1	46.4 × 32.7	25 August 1938	MZH 42424 (R. Kreuger 12422)
1	44.1 × 33.6	11 September 1938	MZH 42425 (R. Kreuger 12423)
1	43.5 × 33.0	15 September 1938	MZH 42426 (R. Kreuger 12424)

walled-up cave (RCS Library n.d.). Although he was unable to retrieve these specimens, others were donated by him to what is now the Natural History Museum, Tring, and other collections (RCS Library n.d.).

A substantial part of French's egg collection was subsequently acquired by Ragnar Kreuger (1897–1997), a Finnish industrialist and avid egg collector. Kreuger began to collect eggs in the 1910s, purchasing his first private collection in 1917 (<https://web.archive.org/web/20110716144551/http://www.luomus.fi/elaintiede/selkarankaiset/kokoelmat/munakokoelma.htm>). Over several decades he acquired one of the largest and most diverse, private egg collections in the world. In 1962 Kreuger gifted the entire collection, numbering *c.*60,000 eggs (E.-S. Hyytiäinen pers. comm.) to the University of Helsinki, where it is maintained in the Finnish Museum of Natural History (MZH).

Between 25 August and 15 September 1938 three active nests of Chestnut-bellied Imperial Pigeon were discovered by French on Malaupaina Island (*c.*10°14'52.80"S, 161°58'12.00"E; see Table 1). According to the label data associated with the eggs, the nests were simple platforms of sticks, placed on horizontal branches *c.*4.5–6.0 m above ground. All three nests were located in ridgetop forest and contained a single egg. Two of the three eggs were presumably collected during the mid to late incubation period, as their development was described as advanced.

The egg (see Fig. 1) is elliptical and white, typical of the genus *Ducula*. Mean size of the three eggs is 44.66 × 33.10 mm, range 43.5–46.4 × 32.7–33.0 mm. Mean shell weight is 1.681 g (*r* = 1.63–1.73 g; *n* = 3).

These data suggest that egg laying presumably peaked in August–September on the Three Sister Islands, and that clutch size is typically a single white egg. The latter is consistent with published information for congeneric taxa (Gibbs *et al.* 2001, del Hoyo *et al.* 2019).

These historic breeding records once more demonstrate the relevance of museum collections in contributing to a better knowledge of the biology of relatively little-known species. However, further research is essential for a fundamental understanding of the breeding biology, general ecology, and long-term conservation of this poorly known endemic.



Figure 1. Egg of Chestnut-bellied Imperial Pigeon *Ducula brenchleyi* (MZH 42424; R. Kreuger catalogue no. 12422) (Emma-Sofia Hyytiäinen © LUOMUS)

Acknowledgements

We thank the Finnish Museum of Natural History and the LUOMUS staff for permitting us to use the data presented here. Furthermore, we are grateful to Alexandre Aleixo for helping us with the initial request. We particularly acknowledge the assistance of Emma-Sofia Hyytiäinen, who generously helped extract data from the original labels, and provided the photograph. We thank Guy Kirwan and David Gibbs for their suggestions and comments, which significantly improved the quality of the submitted draft.

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