

## From Cape Verde to the Netherlands via Portugal and France: the journey of an early specimen of the giant skink *Chioninia coctei* (Duméril & Bibron, 1839)

Luís M.P. Ceriaco<sup>1,2</sup>

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### ABSTRACT

An old specimen of the extinct giant skink *Chioninia coctei* (Duméril & Bibron, 1839), endemic to the islets of Branco and Raso, Cape Verde Islands, in the Naturalis Biodiversity Center, Leiden, the Netherlands, had been misidentified as *Leiolopisma telfairii* (Desjardin, 1831). The specimen, acquired by the Leiden Museum from the Muséum national d'Histoire naturelle in Paris during the 19th century, is demonstrated to be one of the specimens of *C. coctei* sent to Portugal by João da Silva Feijó during the 1780s. It was brought from Lisbon to Paris by Étienne Geoffroy Saint-Hilaire during the Napoleonic invasion in 1808. Together with the specimen remaining in the Paris museum, it is the oldest known of the species. The likely pathway of dispersal, as well as the general characteristics of the specimen, are discussed.

### RESUMO

Um espécimen antigo do extinto lagarto gigante *Chioninia coctei* (Duméril & Bibron, 1839), endémico dos ilhéus Branco e Raso do arquipélago de Cabo Verde, encontra-se actualmente nas colecções do Naturalis Biodiversity Center, Leiden, Países Baixos, erroneamente identificado como *Leiolopisma telfairii* (Desjardin, 1831). O espécimen, que terá dado entrada no Museu de Leiden vindo do Muséum national d'Histoire naturelle de Paris no século XIX, é aqui apresentado como um dos espécimenes de *C. coctei* enviados para Portugal por João da Silva Feijó durante a década de 1780. Terá sido enviado de Lisboa para Paris por Étienne Geoffroy Saint-Hilaire durante a invasão Napoleónica de 1808. Conjuntamente com o espécimen presente no Museu de Paris, apresenta-se como o exemplar mais antigo da espécie que actualmente se conhece. É discutida neste artigo a trajectória singular de dispersão do exemplar, bem como as suas características gerais.

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<sup>1</sup> CEHFCi (Centro de Estudos de História e Filosofia da Ciência), University of Évora, Palácio do Vimioso, Largo Marquês de Marialva 8, 7000-809 Évora, Portugal; [luisceriaco@netcabo.pt](mailto:luisceriaco@netcabo.pt)

<sup>2</sup> Museu Nacional de História Natural e da Ciência, Rua da Escola Politécnica 58, 1250-102 Lisboa, Portugal

## INTRODUCTION

The Cape Verde giant skink *Chioninia coctei* (Duméril & Bibron, 1839)<sup>1</sup> is an endemic and iconic species of the Cape Verde Islands, considered extinct since the beginning of the 20<sup>th</sup> century (Schleich 1996, IUCN 2012). Very few specimens remain in natural history collections around the world (Andreone 2000). During recent investigations into the history and pathways of dispersal of 18<sup>th</sup> and 19<sup>th</sup> century Portuguese natural history collections (cf. Ceríaco & Bour 2012), indications emerged that an old specimen of *C. coctei* – misidentified as *Leiopisma telfairii* (Desjardin, 1831), a species from Round Island, near Mauritius – could be present in the collections of the Naturalis Biodiversity Center (formerly Rijksmuseum van Natuurlijke Historie) in Leiden, the Netherlands, having been presented to the Leiden museum by the Muséum national d'Histoire naturelle in Paris during the 19<sup>th</sup> century. At the time, exchanges of specimens between natural history museums were common practice and considered a sign of goodwill and collaboration between scientists and institutions. These transfers often consisted of duplicate specimens, as natural history investigations (and thus the composition of

collections) largely focused on taxonomic diversity amongst species rather than variation within populations. Therefore, the usual policy of museums was to retain a single (sometimes one male, one female and one juvenile) representative of a species, transferring most duplicates to other museums. This web of transfers contributed to the spread of natural history knowledge throughout Europe, as well as enriching natural history collections. Many of today's natural history collections are a direct result of this process of dispersal and the study of these collections is a subject of study for both biologists and historians (Ceríaco *et al.* in press).

To confirm the identity of the skink specimen discussed herein and to trace the pathway that led to its current repository, Dr Esther Dondorp, curator of herpetology at the Naturalis Biodiversity Center, and Dr Chris Smeenk, emeritus curator of mammalogy at the same institution, were contacted. In order to study the specimen first-hand, the Naturalis collections were visited in January 2013. In this paper, a brief history of the specimen is presented, highlighting its rarity and the singularity of its pathway of dispersal.

## THE ROYAL CABINET OF NATURAL HISTORY OF AJUDA

The beginning of natural history collections in Portugal can be traced back as far as 1768 with the foundation of the Royal Botanical Garden and Cabinet of Natural History of Ajuda in Lisbon, under the superintendence of the Paduan naturalist Domingos Vandelli (1735-1816). Under the direction of Vandelli, the Royal Museum of Ajuda followed the prevailing European trends in Natural History, such as the adoption of the Linnean system of nomenclature and the exploration of vast and largely unknown overseas territories. Vandelli, who was also professor of chemistry and natural history at the University of Coimbra, trained several students to carry out 'philosophical voyages' to the Portuguese overseas territories. From the 1780s onwards, these voyages resulted in 1,000s of specimens, enriching and bringing international fame to the Cabinet of Ajuda. One of Vandelli's students, the naturalist João da Silva Feijó (1760-1824), was entrusted the 'philosophical voyage' to the Cape Verde Islands. Feijó's voyage to Cape Verde was mired with difficulties and, in

terms of collections, much less profitable than the voyages of some of his colleagues, such as that of Alexandre Rodrigues Ferreira to Brazil. Nevertheless, his voyage resulted in some shipments of natural history products to Ajuda (Pereira 2002, Ceríaco *et al.* in press). By the late 18<sup>th</sup> century and mostly due to these voyages, the Cabinet of Ajuda housed one of the richest natural history collections in Europe, which aroused the interest of foreign naturalists. In 1808, after the Napoleonic invasion of Portugal, the French zoologist, Étienne Geoffroy Saint-Hilaire (1779-1844), was appointed to visit and study the Portuguese natural history collections with the main objective of selecting material lacking in the Paris museum. Obviously, due to its rich Brazilian collections, the Cabinet of Ajuda was the main target and Geoffroy selected a considerable number of specimens, mostly from Brazil. The original inventory of specimens selected lists about 76 mammals, 284 birds, 32 amphibians and reptiles, 97 fishes, as well as a large number of invertebrates, mineralogical and

fossil specimens, herbariums, books and manuscripts (Daget & Saldanha 1989). For several years, these specimens were studied by naturalists of the Paris museum, leading to the description of dozens of species new to science, and some are still used in scientific discourse today (cf. Ceríaco & Bour 2012). After the end of the Napoleonic era, the Cabinet of Ajuda entered a prolonged phase of decline, ultimately resulting in its closure in 1836 and the transfer of all of its remaining collections to the newly created National Museum of Lisbon, at the time

housed at the premises of the Academy of Sciences in Lisbon. The museum and its collections remained there until 1858, when it was transferred to the Polytechnic School of Lisbon, under the supervision of the Portuguese zoologist José Vicente Barbosa du Bocage (1823-1907). The few remaining specimens from Ajuda were incorporated in the new collections made from the second half of the 19th century onwards, until a catastrophic fire destroyed almost all in 1978.

### GIANT SKINK SPECIMENS FROM AJUDA

The first specimens of *C. coctei* were collected by João da Silva Feijó in 1784, during his ‘philosophical voyage’ to the Cape Verde Islands. In one of his inventories<sup>2</sup>, listing the natural products collected on the island of Santa Luzia and the islets of Branco and Raso and remitted to the Royal Cabinet of Ajuda, Feijó refers to ‘2 *Lagartos do d.<sup>a</sup> Ilheo*’ (two lizards from the islet [of Branco]). In another manuscript<sup>3</sup>, written after Feijó’s return to Portugal, while working at the Cabinet of Ajuda, the naturalist briefly refers to the species as ‘a large and fat kind of lizard’, with a skin ‘covered with fish scales’, and used by the locals to make footwear, pointing out that the species only occurred on one of the uninhabited islets west of the island of São Nicolau (see Carreira 1986). This was the first and only reference to the species made by a Portuguese naturalist until 1873.

The amphibians and reptiles sent to Paris by Geoffroy were handed to Bernard Germain Lacépède (1756-1825), curator of the reptile (including amphibians) and fish department of the Paris museum. Lacépède produced a rather detailed list of all the specimens received<sup>4</sup>, using a notation system to indicate the importance of each specimen. This notation used the symbols +, ++ and +++, in which ‘*la croix unique, expliquait-il, désignent les objets qui manquent à la collection, la double croix ceux qui en ont sont inconnus, la triple croix les objets les plus remarquables*’ (the single cross refers to those objects that are lacking in the collection, the double cross to those that are unknown, the triple cross to those most remarkable). Marked ++ were ‘2 autres *Scinques tout à fait nouveaux*’ (two others completely new skinks). These specimens were inserted in the first section of the

list (‘§ 1 - *Conservés secs et emapillés*’, i.e. conserved dry and stuffed), implying that the two ‘*Scinques*’ were mounted specimens. Since no other new scincid is known to have been present in the Ajuda collections, these are inferred to be specimens of *C. coctei* sent to Portugal by Feijó during his sojourn in the Cape Verde Islands.

After their arrival in Paris, one specimen was studied by some of the foremost naturalists of the time, i.e. Georges Cuvier (1769-1832), André Marie Constant Duméril (1774-1860) and Gabriel Bibron (1805-1848). The first to examine the specimen was Cuvier, who extracted the skull and depicted it in his magnum opus, *Recherches sur les Ossements Fossiles* (Cuvier 1824). Duméril & Bibron (1839) described the species and named it *Euprepes coctei*, based on the single specimen present in the Paris museum (MNHN 8299-Sc 371), the same from which the skull studied by Cuvier was taken. Despite the fact that two individuals had been sent by Geoffroy in 1808, only a single specimen figures in Cuvier’s (1824) and Duméril & Bibron’s (1839) works. It is important to note that Duméril & Bibron (1839) did not know the geographical origin of the animal, but only that it had been brought from Portugal to Paris by Geoffroy, and they put forward the hypothesis that the specimen originated from the coasts of Africa. This situation was mainly due to the lack of original labels on most of the Ajuda specimens, a problem that has led to numerous errors (Daget & Saldanha 1989).

The specimen currently present in Leiden was apparently sent from Paris to the Netherlands before Duméril & Bibron (1839) described and named the species. In a catalogue<sup>5</sup> from 1835 in the Naturalis archives, signed by Hermann Schlegel (1804-1884), at the time

curator of vertebrates under the Leiden museum's first director Coenraad Jacob Temminck (1778-1858), 102 items are listed, one of which (No. 92) reads '*Scincus Telfarii* [sic], *île de France*' (the old French name of Mauritius). '*Scincus Telfarii*' (= *Leiolopisma telfairii*), then recently described by Desjardin (1831), is a species of 'giant skink' endemic to Round Island, off Mauritius, somewhat similar in general appearance to *C. coctei*. This listing most probably refers to the specimen in Naturalis discussed here, since, according to the original label, the specimen was identified as '*Scincus Telfarii*' from '*Île Ronde*' (Fig. 1). This is repeated on the pedestal, which, in Schlegel's handwriting, reads '*Ile ronde près de Mauritius*'. However, despite the apparent correspondence between catalogue and labels, there is a discrepancy, since the labels mention the specimen having been acquired from the Paris Museum in 1838, while the catalogue is dated 1835. The annual reports of the Leiden Museum over these years do not shed light on this, but perhaps the material from Paris arrived later or - more likely - was catalogued only in 1838. During this period, Temminck regularly filed complaints with the government about the lack of

space at the museum's original premises and shipments of specimens often remained unpacked for years (Holthuis 1995). Given the above, it seems altogether reasonable to assume that the specimen is in fact the second *C. coctei* reported by Lacépède.

After Duméril & Bibron's (1839) description, more than 30 years passed before something was heard again about the taxon. Having received three live specimens of the species from Francisco Frederico Hopffer, head of the public health service in Cape Verde, combined with information received from French correspondents, Bocage (1873a,b) was able to establish that the islet of Branco constituted the natural habitat of the species. He proceeded by coining a new genus, *Macroscincus*, for it (Bocage 1873b). Around the same time, he identified three more specimens of *C. coctei* in the collections of the Lisbon museum that had once belonged to the Cabinet of Ajuda (Bocage 1873a,b, 1896). Moreover, Bocage (1873a,b) mentioned that he had located an original manuscript list in which the specimens, including two '*lagartos*' (Bocage 1896), shipped by Feijó in 1784 were recorded, clearly the same list as referred to above.

#### THE LEIDEN SPECIMEN

The Leiden specimen is an old mounted animal attached to a small pedestal (23 x 34.5 cm), which in turn is attached to a larger pedestal (27 x 62 cm), with the catalogue number RMNH-RENA 17057 (Fig. 1). The animal is mounted in a straight position, with the open mouth almost closed. The general state of conservation is good, with the exception of the tail which is cracked in several places. Since the animal is mounted on the smaller pedestal, it is almost impossible to detach it without damaging the specimen. Therefore, the only measurement taken was the total length of 56.5 cm. In addition to its general appearance, the specimen shows all the distinctive characters of *C. coctei*, such as the multi-cusped teeth and the shape of the head scales. Comparing the specimen with other mounted examples of *C. coctei*, particularly those in the collections of the *Escola Secundária Passos Manuel* in Lisbon, which date from the second half of the 19th century, it is obvious that the Leiden specimen is much older, due to its

general appearance and the taxidermical techniques employed. The specimen shows many similarities with the Paris specimen and also shows some distinctive characteristics of the old Ajuda taxidermical techniques, such as the large belly scar and the typical 'waxed' appearance, both similar to the Paris specimen.

With its taxonomic identity and provenance now being established beyond reasonable doubt, it could be assumed that the Leiden specimen of *C. coctei* is part of the type series. Because neither a holotype nor a lectotype has been fixed, the Leiden specimen would automatically be a syntype (cf. Art. 72.1, 72.4 and 73.2 of the Code; ICZN 1999). However, the situation is complicated by the fact that, as mentioned above, there exists a list by Feijó in which he explicitly mentions the shipment of two specimens. Because Bocage (1873a,b, 1896) located another three *coctei* specimens from Ajuda in the Lisbon museum, there must have been at least five in the Cabinet of Ajuda<sup>6</sup>.



Fig. 1. *Chioninia coctei* (Duméril & Bibron, 1839), RMNH-RENA 17057, Naturalis Biodiversity Center, Leiden, the Netherlands, 14 January 2013 (Luis Ceríaco; ©Naturalis Biodiversity Center).

This implies that Feijó made more than one shipment of *C. coctei* specimens, making it impossible to know whether the two specimens selected by Geoffroy were precisely the two included in Feijó's list. Although the precise duration of his stay has as yet not been clarified, it seems that Feijó remained in the islands for several years, having ample time to obtain more specimens. Another, in view of the times and circumstances rather remote possibility is that the

three specimens discovered by Bocage (1873a,b) were not shipped by Feijó, but were obtained from another source at some time during the early 19th century. In any case, as the three specimens in the Lisbon museum were destroyed in the 1978 fire, to all intents and purposes it seems judicious to consider the two surviving specimens from Ajuda, presently in Paris and Leiden, as constituting the type series of *C. coctei*.

## DISCUSSION

Based on its external characteristics, the specimen presently in the collections of the Naturalis Biodiversity Center in Leiden can be positively identified as a specimen of *C. coctei*. Despite the lack of definitive data, but supported by an array of circumstantial evidence, it can be concluded that it originally came from the Royal Cabinet of Natural History of Ajuda and therefore was collected by João da Silva Feijó during his ‘philosophical voyage’ to the Cape Verde Islands. There are several arguments that support this: 1) its incorporation in the collections of the Paris museum must have been the result of Geoffroy’s shipment of specimens from Portugal, since no other naturalists visited the Cape Verde Islands and sent specimens of *coctei* after Feijó for more than 80 years; 2) although Duméril & Bibron (1839) described the species based on a single specimen from the Cabinet of Ajuda, two specimens had been shipped to Paris by Geoffroy; 3) the species’ geographical distribution remained unknown until 1873, when new specimens arrived in Lisbon (Bocage 1873a,b), reinforcing the first argument; 4) the Leiden specimen still has the original labels and identification as ‘*Scincus telfairii*’ from ‘*île Ronde*’ and the note of being offered by the Paris Museum, dating from before the publication of Duméril & Bibron’s (1839) description, thus agreeing with the reference in the Leiden catalogue; and 5) the taxidermical

techniques and general characteristics of the specimen positively match with other remaining Ajuda specimens, including the *coctei* specimen in Paris.

The correct identification of this specimen and its pathway of dispersal constitute a considerable novelty vis-à-vis the unfortunate story of *C. coctei*, but also provides new data for investigators. For biologists this identification is not only important because it corrects an identification error perpetuated through time, but also because it represents the discovery of a specimen of an extinct species. Therefore, the remaining specimens represent the only opportunity to study the species and they are in fact the only material evidence of *C. coctei*’s former existence, a situation that is even more pregnant given the rarity of specimens of *coctei* in museums around the world. For historians of science, the pathway of dispersal of this particular specimen is a fine example of the web of transfers, practices and relations amongst 19th century natural history institutions in Europe. This case has particular importance because it illustrates a pathway of specimens from the Ajuda collection so far unknown, but also because it represents a very old specimen, still surviving today. The specimen can therefore reclaim its legitimate place as a rare and historical representative of the legendary, but tragically extinct, Cape Verde giant skink.

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## NOTES

- <sup>1</sup> For the use of *Chioninia* rather than *Mabuya* or *Macroscincus* for the giant skink, see Miralles *et al.* (2010).
- <sup>2</sup> *Lista das Produçoens de S<sup>ta</sup> Luzia; Ilheos Raso; e Br<sup>co</sup> que observou, recolheo e remeteo p.<sup>a</sup> o Real Gabinete do Prince N. Snr. em o anno de 1784*, presently in the historical archive of the Museu Bocage, Lisbon - AHMB Rem. 558C.
- <sup>3</sup> *Ensaio filosófico e Político sobre as Ilhas de Cabo Verde, escrito e oferecido à Real Academia das Ciências por João da Silva Feijó, naturalista que foi encarregado do serviço de S. Mag. do exame das mesmas Ilhas em 1797.*
- <sup>4</sup> *Reptiles et Poissons rapportés du Portugal par M. le Professeur Geoffroy St Hilaire.*
- <sup>5</sup> *Catalogue de Reptiles cédés en Juin 1835 sous titre d'échange du Musée de Paris à celui des Pays-Bas.*
- <sup>6</sup> Indeed, unaware that in fact two specimens had been moved to Paris, Bocage (1902) concluded that Feijó had shipped a total of four specimens of *C. coctei*.

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