



Title	A neotype designation for the Ascension Frigatebird <i>Fregata aquila</i> (Aves: Fregatidae)
Authors	Carlos, CJ; Voisin, J-F; Grouw, HV; Moreno, IB
Description	The file attached is the Published/publisher's pdf version of the article. This is an OpenAccess article.
Date Submitted	2015-06-15

SHORT COMMUNICATION

A neotype designation for the Ascension Frigatebird *Fregata aquila* (Aves: Fregatidae)

Caio J. Carlos^{1*}, Jean-François Voisin², Hein van Grouw³ & Ignacio B. Moreno¹

¹Laboratório de Sistemática e Ecologia de Aves e Mamíferos Marinhos, Departamento de Zoologia, Instituto de Biociências, Universidade Federal do Rio Grande do Sul. Avenida Bento Gonçalves 9500, Agronomia, 91501-970 Porto Alegre, RS, Brazil.

²Laboratoire d'Entomologie, Direction des Collections, Arthropodes terrestres, Muséum national d'Histoire naturelle. C.P. 50, 57 rue Cuvier, F-75005 Paris, France.

³Bird Group, Department of Life Sciences, The Natural History Museum. Tring, Hertfordshire, HP23 6AP, United Kingdom.

*Corresponding Author. E-mail: macronectes1@yahoo.co.uk

ABSTRACT. A neotype is designated for *Pelecanus aquilus* Linnaeus, 1758 (currently *Fregata aquila*; Aves, Fregatidae) to fix the identity of this nominal species.

KEY WORDS. Ornithology, seabird, Suliformes, taxonomy, zoological nomenclature.

Perhaps the most important element in the process of naming a taxon is the clear, unequivocal designation of a name-bearing type. However, this was not always so. In the years around the publication of the 'Systema Naturae', by Linnaeus in 1758, names were mainly based on texts and illustrations produced by naturalists and/or artists of the 17th and 18th centuries. In the absence of designated type specimens, those often impressive illustrations and/or meagre descriptions of that time have posed, and continue to pose, problems to taxonomists (DUBOIS & NEMÉSIO 2007).

An example of such problems is the formal description, by Johann Friedrich Gmelin, of the Southern Giant Petrel *Macronectes giganteus* (J.F. Gmelin, 1788). According to VOISIN (1981), a painting and drawing by Sydney Parkinson, the artist on Captain James Cook's first voyage around the world (1768-1771), that were interpreted to represent 'types' of the Southern Giant Petrel actually depict specimens that cannot be identified to species. Its brief descriptive text, however, corresponds with the other species in the genus, the Northern Giant Petrel *M. halli* Mathews, 1912 (VOISIN 1981). In order to avoid disrupting the taxonomic stability, VOISIN et al. (1992) asked the International Commission on Zoological Nomenclature to use its plenary powers to validate a neotype of the Southern Giant Petrel for *M. giganteus*, and this was accepted in Opinion 1751 (ICZN 1993).

In this contribution, we address a similar case involving another seabird species – the Ascension Frigatebird *Fregata aquila* (Linnaeus, 1758). The Ascension Frigatebird is a large

seabird that currently breeds only on Boatswain Bird Islet near Ascension Island in tropical South Atlantic Ocean, and ranges at sea off West Africa from the Gulf of Guinea to the mouth of the Congo River (ORTA 1992, ASHMOLE et al. 1994, RATCLIFFE et al. 2008). It is a member of the family Fregatidae Degland & Gerbe, 1867, which contains five living species and 13 subspecies, all in *Fregata* Lacépède, 1799, distributed throughout tropical and subtropical oceans. Frigatebirds have a mostly black plumage (particularly males), long pointed wings, deeply forked tails, and long hooked bills. Adult females have a varying amount of white mostly on breast and belly. Juveniles are white or rufous-headed and have extensive white on underparts (HARRISON 1991, ORTA 1992, WALBRIDGE et al. 2003).

LINNAEUS (1758: 133) described the Ascension Frigatebird under the name *Pelecanus aquilus* as follows: '*P[elecanus] cauda forficata, corpore nigro, capite abdomineque albis*' (tail forked, body black, white on head and belly). The name Linnaeus used for this species repeats that previously used by Johan Loren Odhelius in his 1754 dissertation entitled 'Chinensia Langerströmiana' (formally published under Linnaeus' name in 'Amoenitates Academicae'; LINNAEUS 1759) and by Pehr Osbeck in his 1757 'Dagbok öfwer en Ostindisk resa åren 1750, 1751, 1752', translated into English by Johann Reinhold Forster in 1771 (OSBECK 1757 [1771]). The works by both Odhelius and Osbeck are binomial, but being earlier than 1758, are unavailable under Article 3.2 of the Fourth Edition of the International Code of Zoological Nomenclature, hereafter 'the Code' (ICZN 1999). In

his description of *Pelecanus aquilus*, LINNAEUS (1758) also included five other earlier references to it: '*Alcyon major pulla*' (BROWNE 1756), '*Cari pira* [avis Brasil]' (DE LAET 1663), '*Man of War* [= War]' (SLOANE 1707), '*Avis Rabo forcado*' (PETIVER 1764 [1702-1706]), and '*Frigate bird*' (ALBIN 1738). He also added '*Habitat in Insula Adscensionis aliisque pelagicis*' (Ascension Island and the open sea) as the locality for the species.

By the end of the 19th century, only two valid species of frigatebirds were generally recognized, the larger Ascension Island frigatebird occurring in all tropical oceans, and a smaller frigatebird, *Fregata ariel* (G.R. Gray, 1845) restricted to Indian and Pacific Oceans (OGILVIE-GRANT 1898). MATHEWS (1914) revised frigatebird taxonomy, naming new taxa and determining the status of names already published. There (p. 117-118) he argued that the name *F. aquila* was applicable exclusively to birds from Ascension Island, since it was based on a specimen collected there by Osbeck. Furthermore, in his '*Birds of Australia*', he (MATHEWS 1915: 243) opined that the five 'pre-Linnaean' names quoted in the preceding paragraph were 'purely of historical interest'.

As to the first point, we agree with MATHEWS (1914) that Linnaeus's description, ultimately taken from Odhelius's dissertation, is essentially a summary in Latin of a longer text from OSBECK (1757 [1771]), who (p. 88) described a frigatebird from Ascension Island, recording its plumage as: 'the colour of the whole body... is black: but the head, breast, belly, and fore part of the neck are of a fine white'. This pattern recalls that of a juvenile Ascension Frigatebirds, wherein, however, a complete or broken black band runs across the upper-chest (HARRISON 1991, WALBRIDGE et al. 2003).

Osbeck was a student of Linnaeus who travelled to Asia in 1750-1752 and brought home a collection of natural items, chiefly from China (MERRIL 1916). En route he collected a specimen of the Ascension Frigatebird, as inferred from Odhelius (in LINNAEUS 1759: 239): '*Avis in insula Ascensionis a P. Osbeck capta*' (a bird captured by P. Osbeck on Ascension Island). Nevertheless, there is nothing to clearly suggest that Odhelius, or even Linnaeus, ever saw this specimen themselves, or that it is still extant (cf., e.g., WALLING 1992, ZOOLOGY SECTION 1996, 2001). As to the other point, that pre-Linnaean names are of historical interest only, it is necessary to note that, according to the Article 72.4.1 of the Code (ICZN 1999), 'the type series of a nominal species-group taxon consists of all the specimens included by the author in the new nominal taxon (whether directly or by bibliographic reference), except any that the author expressly excludes'. Therefore, all the specimens described and/or illustrated by authors quoted by LINNAEUS (1758) in his description of *Pelecanus aquilus* are, in principle, syntypes.

The Irish physician and botanist Patrick Browne briefly diagnosed his *Alcyon major pulla* as: '*cauda longiore bifurca*' (long forked tail) and added: 'The Man-of-war bird; or the dark-coloured *Alcyon* with slender forked tail' (BROWNE 1756: 483). The word '*Alcyon*' comes from the Ancient Greek word ἄλκυόν (alkuōn), which means 'Kingfisher' (JOBLING 2010). Thus, the species name

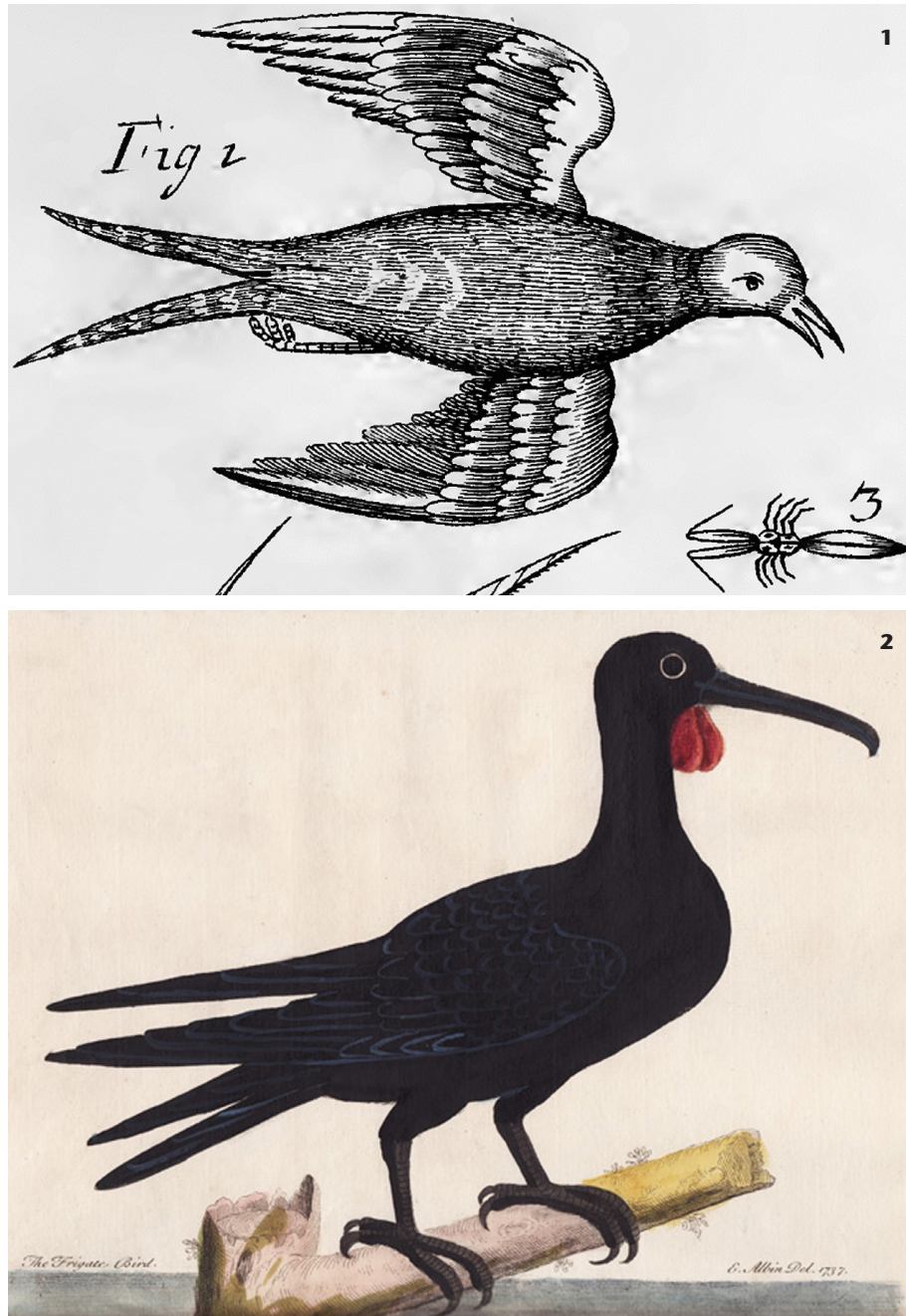
translates as 'The Greater dark Kingfisher', no doubt a reference to the species feeding on fish (ORTA 1992). In the Caribbean, where Browne lived for many years, frigatebirds were called by English sailors as 'Man-of-War bird', the term itself derived from a British Royal Navy expression for a class of warship. BROWNE (1756) neither designated nor illustrated a specimen, but his allusion to a 'wholly dark bird with forked tail' suggests a male Magnificent Frigatebird *F. magnificens* Mathews, 1914, since it is the only member of the family that breeds in the Caribbean (ORTA 1992).

In the Latin edition of his '*History of the New World*' (DE LAET 1663), the Dutch geographer Johannes de Laet mentioned a seabird from Brazil called '*Caripira*', of which he said '*caudam habet bifurcatam, unde & nomen invenit apud Hispanos Rabo-forcado*' (has a forked tail, hence its name Rabo-forcado among the Spanish). The word '*Caripira*' is a corruption of the word '*Grapirá*', which is a Brazilian indigenous (Tupi-Guarani) name for the Magnificent Frigatebird (IHERING 1940). '*Rabiforcado*' is an old Spanish spelling of '*Rabihorcado*' (forked tail; HARTOG 1993). Laet neither mentioned nor illustrated specimens.

During his voyage to Jamaica, the Irish naturalist Hans Sloane reported he saw several '*Men of War Birds* [sic]' while passing near Barbados (SLOANE 1707: 30). He quoted other authors who had also described frigatebirds in their works, DE LAET (1663) among them. Again no specimen was illustrated or otherwise reported.

In 1702-1706, James Petiver, an English apothecary known for his contributions to natural history, published '*Gazophylaceum naturae et artis*', a descriptive catalogue of animals and plants from different parts of the World. This work was collected with others posthumously republished in 1764 under the title '*Jacob Petiver Opera, historiam naturalem spectantia*' (WEISS 1927). There, PETIVER (1764) gave an illustration (plate LIV, fig. 2) and brief text of '*The Indian Forked Tail*'. Its text reads: '*This bird's tail open and shuts like a Taylor's sheers, and for that reason the Portuguese call it Rabo Forcado*'. As noted by EDWARDS (1760: 211), Petiver copied both the figure and text from WILLUGHBY'S '*Ornithology*' (1678: 395; plate LXXVII). This figure, reproduced here as Fig. 1, is very imprecise, and were it not for the fact that the name '*Rabo forcado*' has been mentioned, we would hardly associated the bird represented with a frigatebird.

Eleazar Albin, a German-born, English wildlife illustrator, published '*A natural history of birds*' in 1731-1738. Its paintings were based on actual birds, either living individuals or prepared specimens. Plate LXXX (ALBIN 1738: 75) illustrated an oddly-perched individual titled '*The Frigate Bird*' (Fig. 2), with the attached description: '*The Males are as black as Ravens... He has great red Gills under his throat... which do not appear but in the old ones, the Females had none; they are whiter than Males, especially under the Belly*'. According to ALBIN (1738), the specimen depicted came from an island in the Caribbean called '*Isle of Frigats*'. It is clearly a male (the all-black plumage and red gular pouch are unmistakable; Fig. 2), and probably a Magnificent Frigatebird *F. magnificens*.



Figures 1-2. (1) Plate LIV, figure 2 of PETIVER (1764 [1702-1706]), named 'The Indian Forked Tail'. (2) Plate LXXX of ALBIN (1731), named the 'The Frigate Bird'. Note the all-black plumage and red gular pouch characteristic of adult male frigatebirds.

In summary, none of the accounts of syntypic material cited by LINNAEUS (1758) in his original description of *Pelecanus aquilus* applies unambiguously to the Ascension Island Frigatebird; at least one, however, could involve the Magnificent Frigatebird (BROWNE 1756). Lectotypifying the lost specimen collected by

Osbeck on Ascension Island cannot fix the identity of *Pelecanus aquilus* either because, in the central Atlantic, it can be argued that the specimen could have been a stray of any of three other species of frigatebirds: *F. ariel*, *F. minor* (J.F. Gmelin, 1789) and *F. magnificens*. Thus neotypification provides the only solution if the

name *aquilus* (-a) is to be tied unchallengeably to the Ascension Island frigatebird, the species for which it has been used for over a century. Accordingly, we choose as neotype of *Pelecanus aquilus* Linnaeus, 1758: BMNH 1899.1.4.13, adult breeding male, collected on Ascension Island by Dr. Frank Penrose in December 1877, and now in the Natural History Museum at Tring, UK (Fig. 3). Its measurements (in mm) are: bill (culmen from forehead), 88.3; wing (unflattened chord, from the carpal joint to the tip of the longest primary), 557; tail (from the point of insertion of central rectrices to the tip of the longest rectrix), 352; and tarsus (from the intertarsal joint to the base of the toes), 16.8. This designation satisfies the provisions of Article 75, Neotypes, of the Code (ICZN

1999) by clarifying taxonomic identity and type locality of the Ascension Island frigatebird (Article 75.3.1); nominating its size and green gloss on dorsum and upper-wing coverts as diagnostic characters (Article 75.3.2); providing data and description sufficient to ensure recognition of the specimen designated (Article 75.3.3); giving reasons and references for believing that original type material is lost (Article 75.3.4); selecting a neotype consistent with descriptions of at least some of the former syntypic material (Article 75.3.5); choosing a neotype from the most specific of the originally cited type localities, Ascension Island (Article 75.3.6); and recording that the neotype is the property of a recognized scientific institution (Article 75.3.7)



Figure 3. Neotype of *Fregata aquila* (Linnaeus, 1758): Ventral, lateral, and dorsal views of specimen BMNH 1899.1.4.13 in the Natural History Museum at Tring, UK. Scale bar: 30 cm.

ACKNOWLEDGMENTS

The MS benefited from valuable comments and suggestions made by two anonymous reviewers and Richard Schodde. This contribution is part of an ongoing research, by CJC, on the systematics of frigatebirds and received support from Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), Brazil.

LITERATURE CITED

- ALBIN E (1738) **A natural history of birds: illustrated with a hundred and one copper plates, curiously engraven from the life.** London, The Author, vol. 3, 95p.
- ASHMOLE NP, ASHMOLE MJ, SIMMONS, KEL (1994) Seabird conservation and feral cats on Ascension Island, South Atlantic, p. 94-121. In: NETTLESHIP DN, BURGER J, GOCHFELD M (Eds.) **Seabirds on Islands: threats, case studies and action plans.** Cambridge, Birdlife International, 318p.
- BROWNE P (1756) **The civil and natural history of Jamaica.** London, The Author, viii+503p.
- DE LAET J (1663) **Novus orbis seu Descriptionis Indiae Occidentalis, Libri XVIII.** Lugdunum Batavorum [Leiden], Elzevirios, 708p.
- DUBOIS A, NEMÉSIO A (2007) Does nomenclatural availability of nomina of new species and subspecies require the deposition of vouchers in collections? *Zootaxa* 1409: 1-22.
- EDWARDS G (1760) **Gleanings of natural history, exhibiting figures of quadrupeds, birds, insects, plants, etc. most of which have not, till now, been either figured or described.** London, The Author, xxxv+220p.
- HARRISON P (1991) **Seabirds: An Identification Guide.** London, Christopher Helm, 2nd ed., 448p.
- HARTOG JC (1993) An early note on the occurrence of the Magnificent Frigate Bird [sic], *Fregata magnificens* Mathews, 1914, in the Cape Verde Islands: Columbus as an ornithologist. *Zoologische Mededelingen* 67: 361-364.
- ICZN (1993) Opinion 1751. *Procellaria gigantea* Gmelin, [1789] (currently *Macronectes giganteus*; Aves, Procellariiformes): usage of the specific name conserved by the designation of a neotype. *Bulletin of Zoological Nomenclature* 50: 298-299.
- ICZN (1999) **The International code of zoological nomenclature.** London, The International Trust for Zoological Nomenclature, The Natural History Museum, 4th ed., xxix+336p.
- IHERING R (1940) **Dicionário dos animais do Brasil.** São Paulo, Diretoria de Publicidade Agrícola, 898p.
- JOBLING JA (2010) **Helm dictionary of scientific bird names.** London, Christopher Helm, 432p.
- LINNAEUS C (1758) **Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis.** Holmiae [Stockholm], Laurentius Salvius, vol. 1, 10th ed., 826p.
- LINNAEUS C (1759) **Amoenitates academicae; seu dissertationes variae physicae, medicae, botanicae, antehac seorsim editae, nunc collectae et auctae, cum tabulis aenaeis.** Holmiae [Stockholm], Laurentius Salvius, vol. 4, 600p.
- MATHEWS GM (1914) On the species and subspecies of the genus *Fregata*. *The Austral Avian Record* 2: 117-121.
- MATHEWS GM (1915) **The birds of Australia.** London, Witherby & Co., vol. 4, part 3, xii+141p.
- MERRILL ED (1916) Osbeck's Dagbok Ofwer en Ostindsk Resa. *American Journal of Botany* 3: 571-588.
- Ogilvie-Grant WR (1898) **Catalogue of birds in the British Museum, Volume XXVI. Catalogue of the Plataleae, Herodiones, Steganopodes, Pygopodes, and Impennes in the collection of the British Museum.** London, British Museum (Natural History), xvii+687p.
- ORTA J (1992) *Fregatidae* (frigatebirds), p. 362-374. In: DEL HOYO J, ELLIOT A, SARGATAL J (Eds.) **Handbook of the birds of the World.** Barcelona, Lynx Edicions, vol. 1, 696p.
- OSBECK P (1771) **A voyage to China and East Indies.** London, Benjamin White, vol. 2, 499p.
- PETIVER J (1764) **Jacob Petiver opera historiam naturalem spectantia; or Gazophylaceum containing several 1000 Figures of Birds, Beasts, Reptiles, Insects, Fish, Beetles, Moths, Flies, Shells, Corals, Fossils, etc, from all Nations on 156 Copperplates, with English and Latin Names.** London, John Millan, 452p.
- RATCLIFFE N, PELEMBE T, WHITE R (2008) Resolving the population status of Ascension Frigatebird *Fregata aquila* using a 'virtual ecologist' model. *Ibis* 150: 300-306. doi: 10.1111/j.1474-919X.2007.00778.x
- SLOANE H (1707) **A voyage to the islands Madera, Barbados, Nieves, S. Christophers and Jamaica: with the natural history of the herbs and trees, four-footed beasts, fishes, birds, insects, reptiles, &c. of the last of those islands.** London, The Author, vol. 1, xlix+264p.
- VOISIN J-F (1981) Quelle espèce Gmelin a-t-il décrite sous le nom de *Procellaria gigantea*? *Le Gerfaut, Revue belge d'Ornithologie* 71: 251-255.
- VOISIN J-F, BROOKE RK, BOCK WJ, BOURNE WRP, COOPER J, CROXALL JP, ESCALANTE R, HAFTORN S, HOGSTAD O, HUMPHREY PS, HUNTER S, JOUANIN C, LAMBERT K, LERAUT P, SHAUGHNESSY PD, VUILLEUMIER F, WARHAM J (1992) Case 2784. *Procellaria gigantea* Gmelin, [1789] (currently *Macronectes giganteus*; Aves, Procellariiformes): proposed conservation of usage of the specific name by designation of a neotype. *Bulletin of Zoological Nomenclature* 49: 140-143.
- WALBRIDGE G, SMALL B, MCGOWAN RY (2003) Ascension Frigatebird on Tíree – new to the Western Palearctic. *British Birds* 96: 58-73.
- WALLING L (1992) Linnaean specimens in the Zoological Museum of Uppsala University. *Archives of Natural History* 19: 219-230. doi: 10.3366/anh.1992.19.2.219
- WEISS HB (1927) James Petiver's Gazophylacii. *Journal of the New York Entomological Society* 35: 411-414.

WILLUGHBY F (1678) **The ornithology of Francis Willughby of Middleton in the county of Warwick Esq...: in three books: wherein all the birds hitherto known, being reduced into a method sutable [sic] to their natures, are accurately described: the descriptions illustrated by most elegant figures, nearly resembling the live birds, engraven in LXXVII copper plates.** London, John Martyn, 636p.

ZOOLOGY SECTION (1996) **Catalogue of type specimens. 2. General zoology.** Uppsala, Uppsala University, Museum of Evolution, 78p.

ZOOLOGY SECTION (2001) **Catalogue of type specimens. 4. Linnaean specimens.** Uppsala, Uppsala University, Museum of Evolution, 128p.

Submitted: 17 June 2016

Received in revised form: 5 September 2016

Accepted: 25 October 2016

Editorial responsibility: Michel P. Valim

Authors contributions: CJC and JFV conceived the paper; CJC wrote the first draft and all authors discussed ideas and collaborated on subsequent drafts.

Competing Interests: The authors have declared that no competing interests exist.