FIRST RECORD OF PINCOYA STORM PETREL *OCEANITES PINCOYAE* FROM AFRICA, WITH IMPLICATIONS FOR THE TAXONOMY AND ECOLOGY OF *OCEANITES* STORM PETRELS

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ABSTRACT

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On 16 May 2021, a storm petrel was photographed on a pelagic trip in the Benguela Current off Cape Town, South Africa, exhibiting the diagnostic features of Pincoya Storm Petrel *Oceanites pincoyae.* This sighting occurred far from other records, the closest being approximately 7500 km away. The record, therefore, requires us to reassess our understanding of the movements and ecology of Pincoya Storm Petrel, which was previously known only from shallow waters in fjords and adjacent seas in south-central Chile. Pincoya Storm Petrel is considered Data Deficient by the International Union for Conservation of Nature (IUCN), the breeding range remains unknown, and the population was estimated to number only around 3000 individuals. While Pincoya Storm Petrel is recognised as a valid species by the International Ornithological Congress (IOC), eBird/Clements checklists, and the South American Classification Committee, its taxonomic status has been questioned. This sighting of a bird with all the features of Pincoya Storm Petrel distant from previous sightings, and in a markedly different ecological setting, may lead us to re-evaluate our understanding of species limits and phenotypic variation in *Oceanites* storm petrels. Further research to collect phenotypic, phylogenetic, and phenological data will allow us to re-examine species boundaries in Oceanites and enhance our understanding of this fascinating genus.

Key words: Pincoya Storm Petrel range, Pincoya Storm Petrel conservation, *Oceanites* identification, *Oceanites* taxonomy, vagrancy

INTRODUCTION

Storm petrels (families Hydrobatidae and Oceanitidae) are a diverse group of tubenoses occurring widely across the world's oceans. Storm petrel taxonomy remains a dynamic field of research with species limits being revised using new phenotypic, phylogenetic, and phenological data. Among the Hydrobatidae, cryptic taxa have been uncovered in cool- and hot-season breeders of the Band-rumped Storm Petrel *Hydrobates castro* complex nesting on the Azores (Bolton *et al*. 2008, Wallace *et al*. 2017) and Galápagos (Friesen *et al*. 2007) and among seasonal breeders in the Leach's Storm Petrel *Hydrobates leucorhous* complex (Ainley 1980, Power & Ainley 1986). Taxonomic uncertainty also exists within the Oceanitidae, particularly in the genus *Oceanites*. Currently, three species of *Oceanites* are recognised by both the International Ornithological Congress (IOC; Gill *et al*. 2023) and eBird/Clements (Clements *et al*. 2023) checklists: the polytypic Wilson's *O. oceanicus* (subspecies *oceanicus*, *exasperatus*, and *chilensis*) and Elliot's *O. gracilis* (subspecies *gracilis* and *galapagoensis*) storm petrels, and the monotypic Pincoya Storm Petrel *O. pincoyae* (Harrison *et al*. 2013). The *chilensis* subspecies of Wilson's Storm Petrel is sometimes considered a distinct species, known as the the "Fuegian Storm Petrel" (see, for example, Harrison *et al*. 2021, Howell & Zufelt 2019).

The discovery of Pincoya Storm Petrel was sparked by observations of storm petrels in the Puerto Montt area of south-central Chile that did not match the appearance of any described *Oceanites* taxon (Dowdall *et al*. 2009). These birds were distinguished by their striking white upperwing and underwing panels, as well as an extensive white rump that extended around the vent and onto the lower belly. Further investigation revealed that these birds had been seen by multiple observers in the same area dating back to 1983. In addition, two storm petrels collected in 1972 and 1983 at El Bolson, Argentina, 80 km east of the Chilean observations, were re-identified by Peter Harrison as Pincoya Storm Petrel, having previously been labelled as Elliot's Storm Petrel by Pearman (2000). Pincoya Storm Petrel was formally described in 2013 (Harrison *et al*. 2013) and, prior to the Benguela Current record reported here, was only known from a small area of Chile where birds occur year-round (Dowdall *et al*. 2009, Harrison *et al*. 2013, Howell & Schmidt 2016). However, recent records submitted to eBird have expanded its known distribution, with sightings between the Talcahuano area and the Patagonian fjords of Aysen, including the San Rafael Lagoon (Medrano & Norambuena 2022). Despite this, the breeding areas of Pincoya Storm Petrel remain unknown, making it a mysterious species that requires further research to better understand its ecology and behaviour.

The taxonomic status of Pincoya Storm Petrel has been the subject of debate since its initial description. While some consider it a distinct species, others suggest it may be an extreme variant or morph of another *Oceanites* taxon (Howell & Schmidt 2016). Despite this

debate, Pincoya Storm Petrel is recognised as a distinct species by both the IOC and eBird/Clements checklists. Moreover, the South American Classification Committee passed a proposal to recognise its specific status in 2016 (Jaramillo, 2016). Thus, pending future taxonomic revisions of *Oceanites*, records of birds displaying the features of Pincoya Storm Petrel must be evaluated in this framework.

However, observations of apparent Pincoya Storm Petrels in contexts that stretch our understanding of that taxon may require us to re-examine species limits in *Oceanites*. Here, we report an observation that does just that. Our report consists of an individual far from previous sightings displaying the diagnostic characters of Pincoya Storm Petrel. This may lead us to change our current understanding of Pincoya Storm Petrel ecology and/or re-evaluate species limits and phenotypic variation in *Oceanites* storm petrels.

OBSERVATION

On 16 May 2021, while on a pelagic birding trip in the Benguela Current off Cape Town, South Africa, GAJ photographed an unusual storm petrel behind a trawler roughly 30 nautical miles (50 km) southwest of Hout Bay (approximately 34.1°S, 17.9°E). The bird briefly flew past the back of the boat before disappearing into the melee of other birds surrounding the trawler. The storm petrel had the overall structure of an *Oceanites*, being slightly built with smoothly curved wings, feet projecting markedly beyond the tail tip, and a square-ended tail lacking any hint of a fork. However, unlike the many Wilson's Storm Petrels present in the area, the bird had a striking and broad white bar on the underwing coverts that extended onto the base of the primaries. Additionally, the upperwing covert bar was markedly pale, and there was extensive white on the lower belly (Fig. 1, top row).

After seeing photos of the Benguela Current bird, NTK suggested it might belong to one of the eastern Pacific taxa of *Oceanites*, specifically Elliot's or Pincoya storm petrels. In their description of Pincoya Storm Petrel, Harrison *et al*. (2013) outlined the following diagnostic features that distinguish it from all other *Oceanites* species: (1) bold white ulnar (upperwing covert) bars; (2) bold white underwing bar extending onto primary bases, reminiscent of a *Fregetta* storm petrel; and (3) extensive white to the lower belly and ventral area. All three features are shown by the Benguela Current bird.

Fig. 1. Identification of the Pincoya Storm Petrel *Oceanites pincoyae* seen in the Benguela Current off Cape Town, South Africa, in comparison with other *Oceanites* storm petrel species. Note the extensive white underwing coverts of the Cape Town and Chilean *pincoyae*, beyond known variation for ("Fuegian") Wilson's Storm Petrel *O. (wilsoni) chilensis*. Also note the white on the rump that wraps round and extends on to the lower belly of the Cape Town bird more than on *chilensis* but not as extensive as on *gracilis*. Top row: The Cape Town Pincoya Storm Petrel, approximately 50 km SW of Cape Town, South Africa, 16 May 2021. Second row: Four different Pincoya Storm Petrels from previously known range, Ancud Gulf, Chile, February 2020. Third row: Four different (Fuegian) Wilson's Storm Petrel *O. wilsoni chilensis*, Humboldt Current north of Valpariso and south of Coquimbo, Chile, 07–10 March 2020. Bottom row: Four different Elliot's Storm Petrel *O. gracilis*, Humboldt Current north of Lima, Peru, November 2017. (Photos: top row, Gabriel Jamie; remaining rows, Kirk Zufelt)

Additionally, the bird shows an interesting feature on the underwing, namely a black "bar" formed by the tips of the primary coverts which interrupts the white flash (clearly visible in Fig. 1). This feature is present in many images of Pincoya Storm Petrel from known range on the Macaulay Library and was not observed on *chilensis* Wilson's Storm Petrels. For comparison, see Fig. 1, which shows the Cape Town bird (top row) alongside Pincoya Storm Petrel from core-range, and Elliot's and *chilensis* Wilson's Storm Petrel (lower rows).

Images of the Cape Town storm petrel were shared with Robert Flood and Kirk Zufelt, who had recently studied Pincoya Storm Petrel. They agreed that the bird exhibits the diagnostic features of Pincoya Storm Petrel. Here is their response:

> "We are undertaking an ongoing study into the plumage variation in the *Oceanites* complex off South America, Pacific Ocean…. To date we have photos of 400–500 individual *Pincoya pincoyae*, around 250 individual Fuegian *chilensis*, a fair collection of various individual Elliot's *gracilis*, very many individual Wilson's *oceanicus*, and smaller numbers of individual *Oceanites* from Ushuaia and the Chilean fjords. Based on these samples, the white upperwing ulnar bar, underwing covert panel, and lower belly markings of the South African bird are consistent with *pincoyae* (perhaps 65% are this well marked, some less so, others more so) and are outside of the range of variation in *chilensis*, *gracilis*, and *oceanicus*. The South African bird has what our early findings indicate are the diagnostic, large white underwing-covert panel plus two other specific plumage features that will feature in an upcoming publication. There is no evidence of any form of plumage aberration with all features consistent with our sample of *pincoyae*. However, the taxonomy of this complex is yet to be resolved."

On sending the photos to Peter Harrison, who initially described Pincoya Storm Petrel, he replied: "The images that you sent over are without doubt of a classic Pincoya Storm Petrel. Your images match almost exactly Fig. 2 in my 2013 *Auk* paper. See also my illustrations on Plate 144, top right figure (Harrison *et al*. 2021). Your images leave no doubt in my mind, the evidence is simply overwhelming." Photos of the Cape Town bird were also sent to Hadoram Shirihai and Vincent Bretagnolle, who have been studying *Oceanites* storm petrels in the eastern Pacific in preparation for their upcoming *Tubenoses of the World* book. Both agreed the Cape Town bird was a Pincoya Storm Petrel.

Harrison *et al*. (2013) outlined a fourth characteristic of Pincoya Storm Petrel, namely that it has a unique tail pattern with white outer vanes to the basal third of the fifth and sixth retrices. The Cape Town bird was not photographed with tail spread so the presence of this feature cannot be assessed. However, it should be noted that, based on the assessment of Robert Flood and Kirk Zufelt, accurate identification of Pincoya Storm Petrel does not require the tail pattern to be seen. A fifth characteristic of Pincoya Storm Petrel laid out by Harrison *et al*. (2013), that it has a longer middle toe and claw than either Elliot's or Fuegian storm petrels, is likely impossible to assess without a bird in the hand.

Recent observations by Howell and Schmidt (2016) have raised questions about the identification of Pincoya Storm Petrel. Particularly, they question whether some Fuegian Storm Petrels (Wilson's of subspecies *chilensis*) at the extreme end of that species' phenotypic distribution can overlap with some Pincoya Storm Petrel in certain key characteristics, such as the extent of white on the underwing and belly. Additionally, they provide examples of Wilson's Storm Petrel showing white outer vanes to the outer two rectrices, again implying that this feature may not

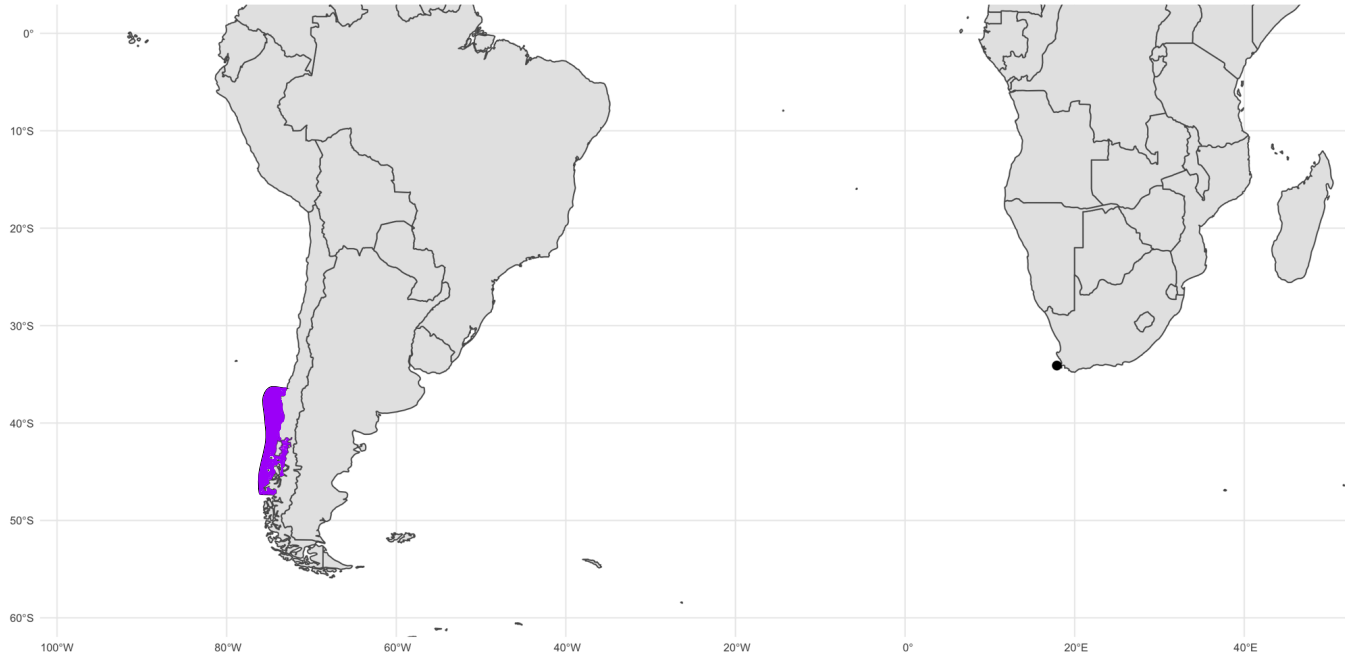

Fig. 2. Location of Pincoya Storm Petrel sighting in Benguela Current off Cape Town, South Africa (black dot) compared to its range based on previous records of Pincoya Storm Petrel (purple polygon) from *Birds of the World Online* (Medrano & Norambuena 2022). Generated with R packages "rnaturalearth" and "ggplot2". The distance between the Cape Town observation and known range is about 7500 km.

be diagnostic of *pincoyae*. They question whether Pincoya Storm Petrel truly represents a separate species or instead is a subspecies or even a morph of Wilson's/Fuegian Storm Petrel. When photos of the Cape Town bird were sent to Steve Howell, he responded that he thought the bird's appearance "agrees with the features of *pincoyae*." However, he expressed his doubt as to the taxonomic status of *pincoyae*, pending further field and molecular work into these taxa. In his opinion, the most honest answer to the question of the bird's identity, given the state of our current knowledge is: "A bird showing characters associated with the enigmatic taxon *pincoya*e." Similarly, Alvaro Jaramillo, while also thinking the bird looked like a Pincoya Storm Petrel, spoke of our incomplete understanding of *Oceanites* storm petrels and wondered whether it represents an undescribed variant of another *Oceanites* taxon.

DISCUSSION

The observation of a bird displaying the features of Pincoya Storm Petrel in the waters of the Benguela Current off Cape Town, South Africa, around 7500 km from nearest known sightings (Fig. 2), raises questions about the distribution and ecology of this species, as well as about *Oceanites* storm petrel taxonomy and phenotypic variation more generally.

There are four possible explanations for this observation. The Benguela Current bird:

(1) is indeed a Pincoya Storm Petrel and that the species' range extends into the south Atlantic, requiring us to update our understanding of the species' movements and ecology.

(2) is a vagrant Pincoya Storm Petrel, similar to many vagrant tubenoses from around the world.

(3) represents an extreme and undescribed variant of another known *Oceanites* taxon.

(4) represents a new and undescribed taxon of *Oceanites* storm petrel.

Based on the current evidence and our existing understanding of *Oceanites* taxonomy and identification, we favour the first or second explanations. The appearance of the Benguela Current bird fits the diagnostic features of Pincoya Storm Petrel and is beyond the known range of variation for any other *Oceanites* taxon. This assessment was agreed upon by several expert observers with extensive experience of phenotypic variation in these taxa. Were this individual to have been seen within the area of existing sightings of Pincoya Storm Petrel, it would have undoubtedly been identified as one. Given how little is known about the movements, ecology, and phenology of Pincoya Storm Petrel (its breeding grounds remain unknown), it is possible that it occurs much more widely than previously thought. If this is true, it would require us to update our understanding of the ecology of Pincoya Storm Petrel. While previous records had suggested the species was a sedentary species of shallow fjords and adjacent coast in the Humboldt Current, the Benguela Current bird implies that it may be one that ranges much more widely, including over deep waters in the Atlantic. Observations of New Zealand Storm Petrel *Fregetta maoriana* off Gau Island, Fiji, far from previous known sightings in New Zealand/Australasia, have similarly led to an updated understanding of that species and suggested that it undergoes long distance migration/dispersal (Flood & Wilson 2017, Flood *et al*. 2022).

Alternatively, rather than indicating a broader range than previously thought, the Benguela Current Pincoya Storm Petrel could have been a genuine vagrant caught up with the movement of other storm petrels from the eastern Pacific. Supporting this explanation is the fact that, despite the large number of pelagic birding trips going out from Cape Town for multiple decades, no *pincoyae* has ever been documented, suggesting that it is truly rare in the Benguela Current. Seabirds in general have huge vagrancy potential (summarised in Lees & Gilroy 2021), and several individuals of *chilensis* Wilson's Storm Petrel were seen on the same pelagic trip off Cape Town (with much reduced white on the underwing, upperwing, and belly compared to the Pincoya). The *chilensis* Wilson's Storm Petrel overlaps in range with Pincoya Storm Petrel in southern South America, and recent sightings of Pincoya from areas further south in coastal Chile suggest that it may have greater vagrancy potential than previously thought (Medrano & Norambuena 2022). Given that the *pincoyae* was only described in 2013 and was not on the radar of local birders, it could easily have been overlooked among the other storm petrels. Now that birders are aware of its potential to occur, it will be interesting to see whether there are more sightings in the coming years that help establish its true status in the Benguela Current.

Another possible explanation for the occurrence of the Benguela Current bird so far from its known range is that Pincoya Storm Petrel is not a valid taxon and instead represents a morph, or extreme variant, found in another *Oceanites* taxon. *Oceanites* vary intra and inter-specifically in the extent of white on the underwing and belly, and it may be that Pincoya lies at the extreme end of a well-established axis of variation within the genus. While future work may lead us to redefine species limits and phenotypic variation among *Oceanites*, for now the extreme levels of white in underwing and vent shown by the Benguela Current bird are not known from any other described *Oceanites* taxon.

Finally, it is possible that the Cape Town bird represents an undescribed taxon of storm petrel that exhibits the phenotype of Pincoya Storm Petrel. The existence of cryptic undescribed *Oceanites* is plausible. For example, Harrison *et al*. (2021) mention the existence of "Pale-bellied Fuegian Storm Petrels" off South America that could represent an undescribed taxon. However, at this point, such an assertion is entirely speculative until further work establishing breeding grounds, seasonality, phenotypic variation, and phylogenetic relationships among *Oceanites* populations is conducted.

CONCLUSION

When evaluated in the context of our current understanding of *Oceanites* taxonomy and identification, the South African bird exhibits the diagnostic features of Pincoya Storm Petrel. The record was accepted as such by the South African Rarities Committee in March 2023. Future work may subsequently change how we delimit species in this group, but based on current knowledge, a storm petrel matching Pincoya Storm Petrel has been seen in the Benguela Current off Cape Town. In general, this observation highlights the challenges of identifying seabirds far from known range (Flood & Zufelt 2023) and reminds us how much we have to learn about these taxa. It provides an excellent example in which a potential vagrant

forces us to re-evaluate our understanding of a species' ecology and/or taxonomy.

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