

An island-wide bioacoustic survey to the bats of Porto Santo, Macaronesia

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Island Biodiversity

Oceanic islands occupy a small fraction of the planet's land area but harbour a significant share of the planet's biodiversity.

Due to their ability to disperse over water, ca. 60% of all bat species occur on islands, and ca. 25% are insular endemics. Habitat changes and introduced predators are the key threats to insular taxa and species vulnerability tends to be higher in smaller islands (Conenna et al., 2017).

Bats in Macaronesia

Macaronesian (composed by the archipelagos of Azores, Madeira, Cape Verde and the Canaries) harbours numerous endemic vertebrates, including several of high conservation concern. Over 16 species of bats occur throughout the multiple Macaronesian islands, three of which can be found in the archipelago of Madeira, namely: the Madeira Pipistrelle (*Pipistrellus maderensis*), Gray Long-eared bat (*Plecotus austriacus*) and Lesser Noctule (*Nyctalus leisleri*).

Only the Madeira Pipistrelle has been recorded in the Island of Porto Santo. However, the species has recently been suggested to be extinct on the island (Jesus et al., 2015).

Main Aim

We aimed to conduct an island-wide acoustic survey complemented with several nights of mist-netting to try to evaluate if there was an extant of *Pipistrellus maderensis* in Porto Santo.

Survey Area

Porto Santo is one of two habituated islands in the Archipelago of Madeira. It was formed ca. 18 Ma years ago, has approximately 42 km² and the highest peak is 517 m asl. The island has a Mediterranean xeric bioclimate and has been mostly deforested. However, it harbours areas of non-native coniferous forests (Fig. 1b).

Methods

In June 2021, we used AudioMoths to survey 55 sites (placed at 800 to 1,000 m from each other, Fig. 1a). Detectors were recorded from sunset to sunrise and were left one night at each site.

Mist-netting was limited to three nights in a water point near Capela da Graça and Pico Castelo (the most forested area of the island, Fig. 1c).

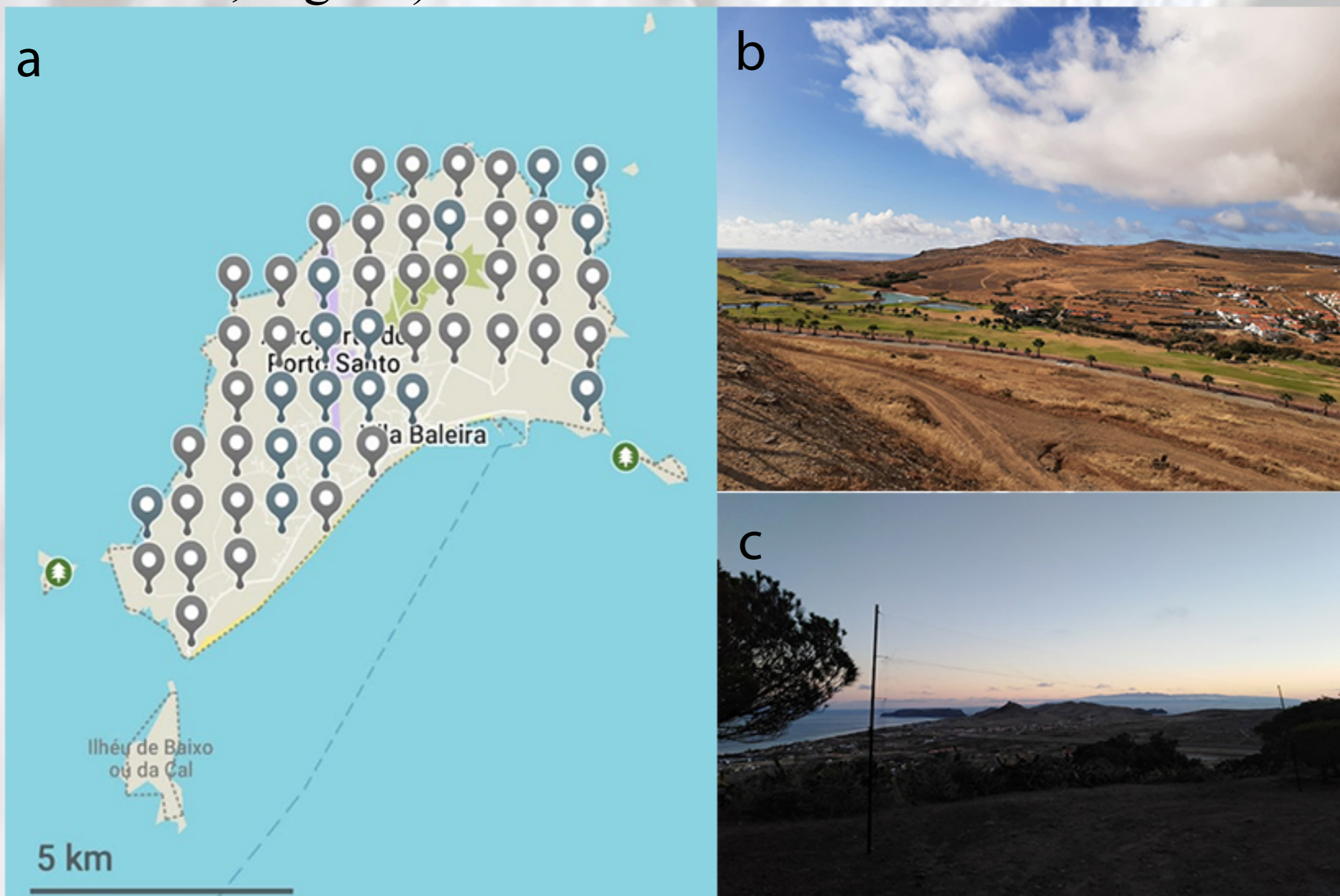


Fig1: a) map of the locations of the recorders in the Porto Santo Island, b) detail of the main habitat of Porto Santo Island, c) Placement of the mist-net in the capture sites

Results

Bat Recordings

We recorded 5880 bat passes from *Pipistrellus maderensis* (Fig.2). Bat passes were detected in 28 out of the 46 sampling sites analysed..

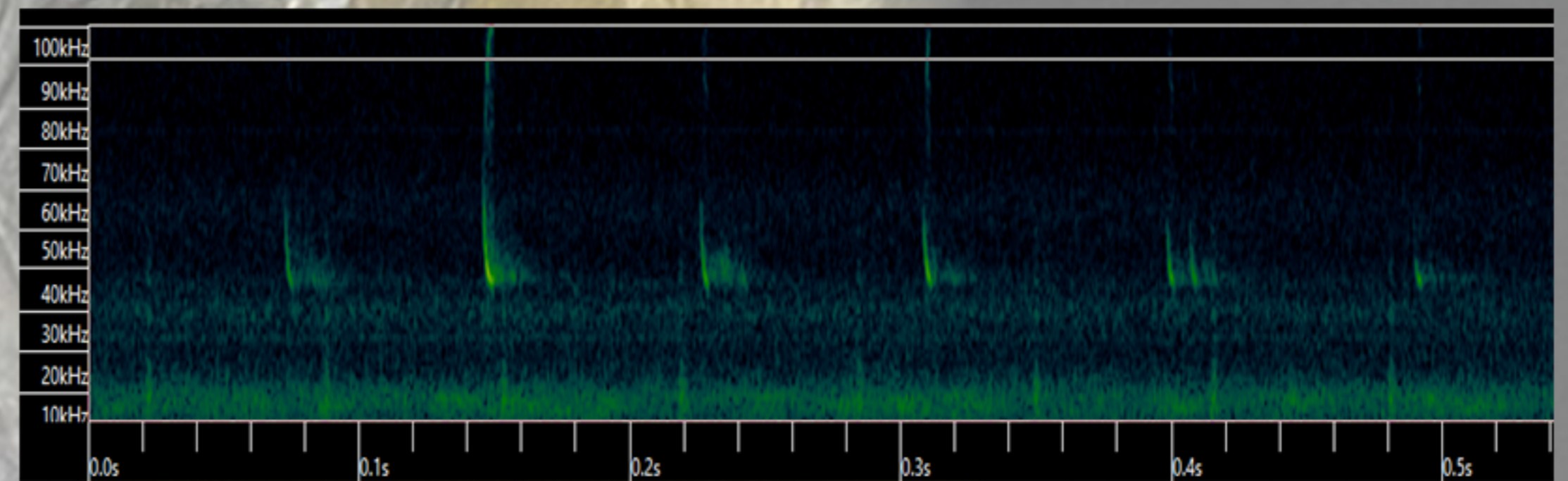


Fig.2: Echolocation of a *Pipistrellus maderensis* recorded in June 2021 in Porto Santo



Bat Captures

We capture six individuals, including a lactating female and five juvenile bats (Fig. 3).

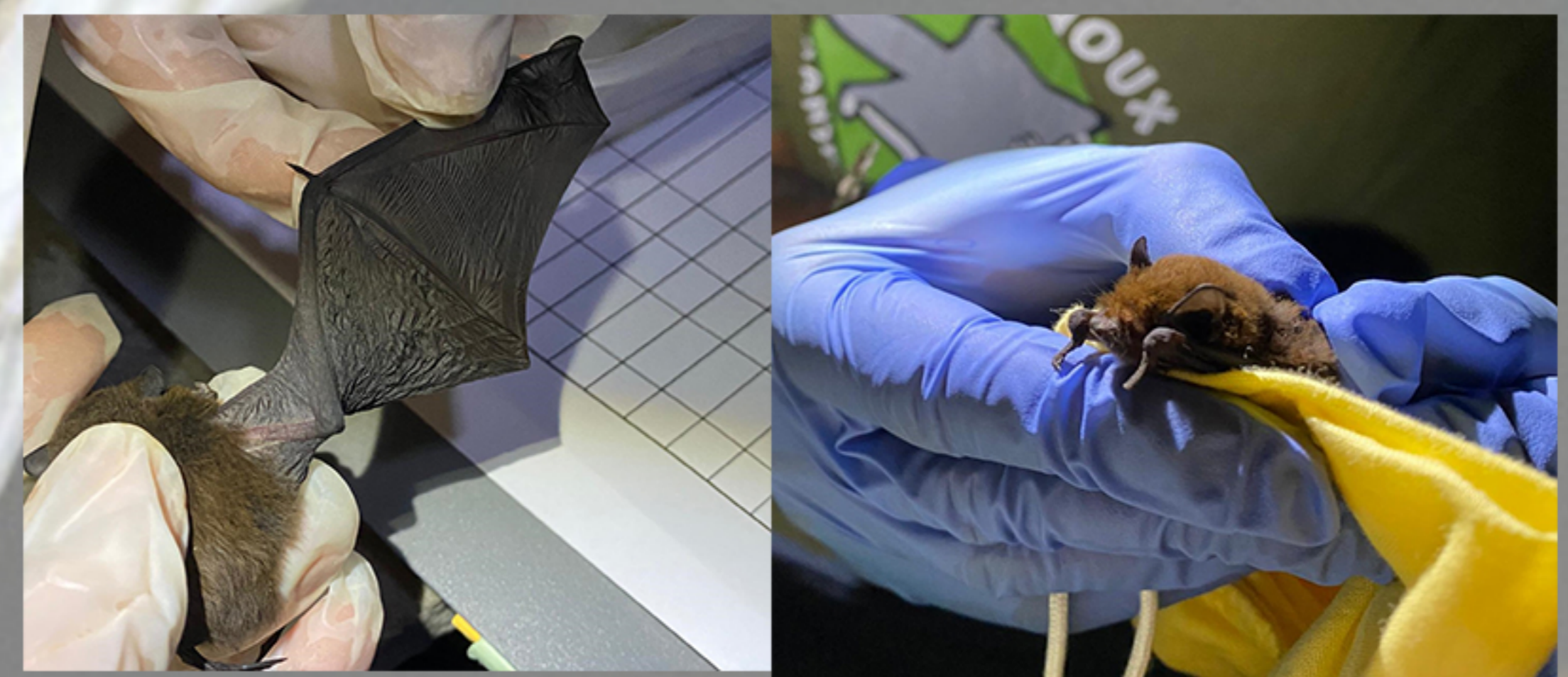


Fig.3: Photos of two *Pipistrellus maderensis* captured in Porto Santo during our fieldwork.

Conservation Implications

Our survey confirms that bats are still present in Porto Santo and that *Pipistrellus maderensis* is actively reproducing in the island.

These findings emphasize the need to target more conservation and research effort towards small island bat populations.

Bibliography

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- Jesus, J., Teixeira, S., Freitas, T., Teixeira, D., & Brehm, A. (2013). Genetic identity of *Pipistrellus maderensis* from the madeira archipelago: A first assessment, and implications for conservation. *Hystrix*, 24(2), 177–180

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