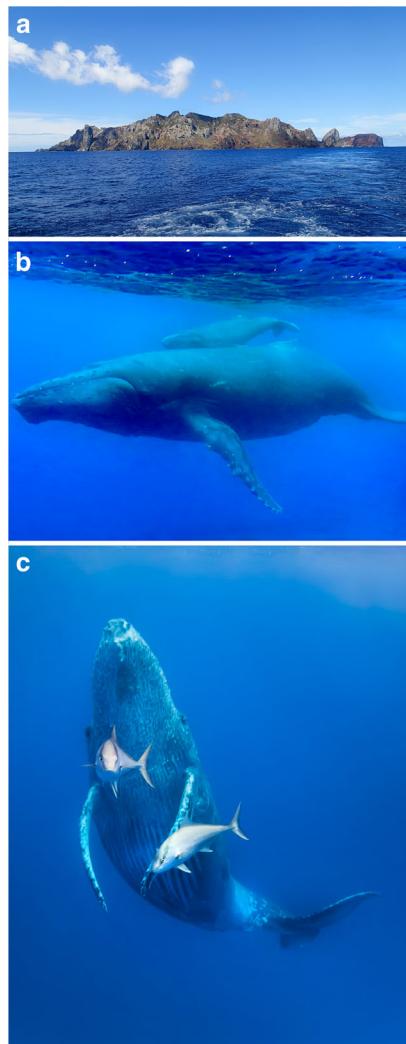


Out of the mainstream: humpback whale calving site and associated fishes at an oceanic island off Brazil

M. B. Lucena¹ · M. C. Barbosa¹ · M. N. Sissini² · I. Sazima³

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In the Southwestern Atlantic, the coastal Abrolhos Bank off Brazil is the most important breeding and calving site for humpback whales, *Megaptera novaeangliae*, during the austral spring and summer (Martins et al. 2001). We present here a previously unrecorded calving site of this whale, the oceanic Trindade Island (Fig. 1a), a volcanic formation situated 1200 km off Brazil, about 1000 km far from Abrolhos. Sightings of humpbacks off Brazil indicate offshore (not coastal) migration from Abrolhos to feeding areas to the south or southeast (Zerbini et al. 2011) and vice-versa, which would explain our records at Trindade Island. In August–September 2014 (late austral winter and early spring), during four diving fish censuses, we opportunistically recorded eight humpback adults around Trindade Island, of which two were mother/calf pairs (Fig. 1b). The presence of mother/calf pairs at Trindade is an uncommon event and may indicate an effect of the increasing humpback population off Brazil. As actions to protect humpback whales benefit from the knowledge of actual and potential breeding and calving sites, records of such ad-



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✉ M. B. Lucena
boucasdelucena@hotmail.com

¹ Departamento de Biologia Marinha, Universidade Federal Fluminense, Niterói, Brazil

² Departamento de Botânica, Universidade Federal de Santa Catarina, Florianópolis, Brazil

³ Museu de Zoologia, Universidade Estadual de Campinas, Campinas, Brazil

Fig. 1 Trindade Island, situated 1200 km off Brazil (a), a humpback whale (*Megaptera novaeangliae*) calf on the back of a female (b), two almaco jacks (*Seriola rivoliana*) swim under a moving adult whale (c)

ditional sites are of particular interest. During our four dives with the whales, we observed four fish species previously unrecorded in association with humpbacks: the carnivorous jacks *Seriola rivoliana* (Fig. 1c) and *Caranx cryos* on one occasion each, *C. ruber* twice and the omnivorous triggerfish *Melichthys niger* on three occasions during the dives. Although we recorded no feeding during these associations, observed until the whales were out of sight (up to 10 min), the fishes probably benefit from this seasonal interaction in the form of food source and cover. Whales play an important role in marine ecosystems, recycling nutrients and enhancing productivity through their nutrient-rich feces (Roman et al. 2014). Pelagic and reef fishes such as *C. cryos* and *M. niger* associate with dolphins and feed on their feces and vomits (Sazima et al. 2003). *S. rivoliana* and *C. ruber* probably feed on cetacean wastes as well, albeit this requires confirmation. Even if adult whales defecate little or not at all at breeding grounds, calves defecate a nutrient-rich material (Sazima et al. 2003). The influence of humpback whales on trophic chains in tropical reefs of the Southwestern Atlantic is unknown, particularly at small and isolated oceanic islands, and further

observations of fishes associated with these cetaceans may shed some light on this relationship.

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