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Play Behavior by a Juvenile Humpback Whale (*Megaptera novaeangliae*) with an Inanimate Object (Driftwood) in the Gulf of Tribugá, Colombia

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Humpback whales (*Megaptera novaeangliae*) are a cosmopolitan species that often visit inshore waters close to the coast, making it easier to see and study them. Consequently, this baleen whale has been researched the most, particularly in Colombia (Flórez-González et al., 2007; Avila et al., 2013). The Colombian Pacific is visited by hundreds of humpback whales from Stock G (that feed along the western Antarctic Peninsula) from early May to late December (Acevedo et al., 2017; Avila et al., 2020). These whales use the warm and calm Colombian waters to breed and mate (Flórez-González et al., 2007; Avila et al., 2013, 2020). The Gulf of Tribugá, located on the north Pacific coast of Colombia, is known for its biodiversity and pristine ecosystems almost untouched by human development. Humpback whales are common here. Throughout the breeding season, humpbacks, including competitive groups of males, solitary males, and mother–calf pairs with or without escorts, can be observed displaying a variety of behaviors.

Assessing whale behavior offers a better understanding of the importance of these species in marine ecosystems as well as giving knowledge about their ecology and habitat use (Kiszka et al., 2015). Focal follow efforts of humpback whales have facilitated research into identifying and categorizing their behavior (Kavanagh et al., 2017), including general behaviors (diving, resting, foraging; Tyson et al., 2012; Friedlaender et al., 2016), surface actions (breach, head lunge, tail and fin slaps; Deakos, 2002; Kavanagh et al., 2017), feeding (via bubble net, lunge-feeding, snaking, surface straining; Hain et al., 1982), and interactive behaviors (spy-hopping, rolling, play with an object, evasion; Félix & Botero-Acosta, 2012), among others (Clapham, 2000; Kiszka et al., 2015; Kosma et al., 2019).

Whales and dolphins often interact in playful ways, which suggests innovation and creativity (Patterson & Mann, 2015), with playful activity prevalent among various species and exhibited by all age classes (Paulos et al., 2010). It has been suggested that play behavior may facilitate an individual's ability to acquire knowledge, adapt to changing environments, contribute to species survival, and provide young animals a venue in which they may cultivate important relationships (Mann & Smuts, 1999; Kuczaj & Makecha, 2008). Nonetheless, defining what play represents in animals is difficult and a subject of debate (Burghardt, 2005). Herein, we report the first observed humpback whale play behavior with a foreign object in the Gulf of Tribugá in Colombia.

In August 2020, ongoing cetacean monitoring was performed by a group of trained fishermen from the Gulf of Tribugá as part of a community science program implemented by the R&E Ocean Community Conservation Foundation as a contingency plan for monitoring marine mammals in the area during COVID-19 lockdown. On 28 August, during a survey, a juvenile humpback whale was encountered. The young whale, ~7 m long, was seen close to Termales (Latitude: 65° 24' 649" N; Longitude: 77° 27' 675" W; Figure 1), within the Gulf of Tribugá, at 1109 h. About 600 m away, the original behavior noted was identified as resting on its back, with the white ventral side visible at the surface. However, once the team carefully approached the individual (~5 m), they detected an object, identified as an ~1.5-m-long piece of driftwood, which this juvenile was rolling around its body. Observations and video-photographic evidence collected by the research team (fishermen) showed the following behaviors displayed by this juvenile humpback whale:

- Very shallow, almost superficial dives, submerging and coming up underneath the driftwood, positioning it on its back close to the dorsal fin, and lifting it (Figures 2A & 3A)
- Rolling observed, which is likely to change the position of the driftwood from its back to its ventral side (Figures 2B & 3B)
- Some type of manipulation or maneuvering of the driftwood with its pectoral fins (Figure 3C), as well as budging and pushing the driftwood with its rostrum (Figures 2C & 3D)
- Tail movements such as very small ventral tail slaps and swishes at surface (see Supplementary Video 1, which is available in the "Supplemental Material" section of the *Aquatic Mammals* website: https://www.aquaticmammalsjournal.org/index.php?option=com_content&view=article&id=10&Itemid=147)

In general, the humpback whale seemed relaxed and to be engaged in a very playful interaction with the driftwood. The whale's behavior did not seem interrupted by the presence of the research

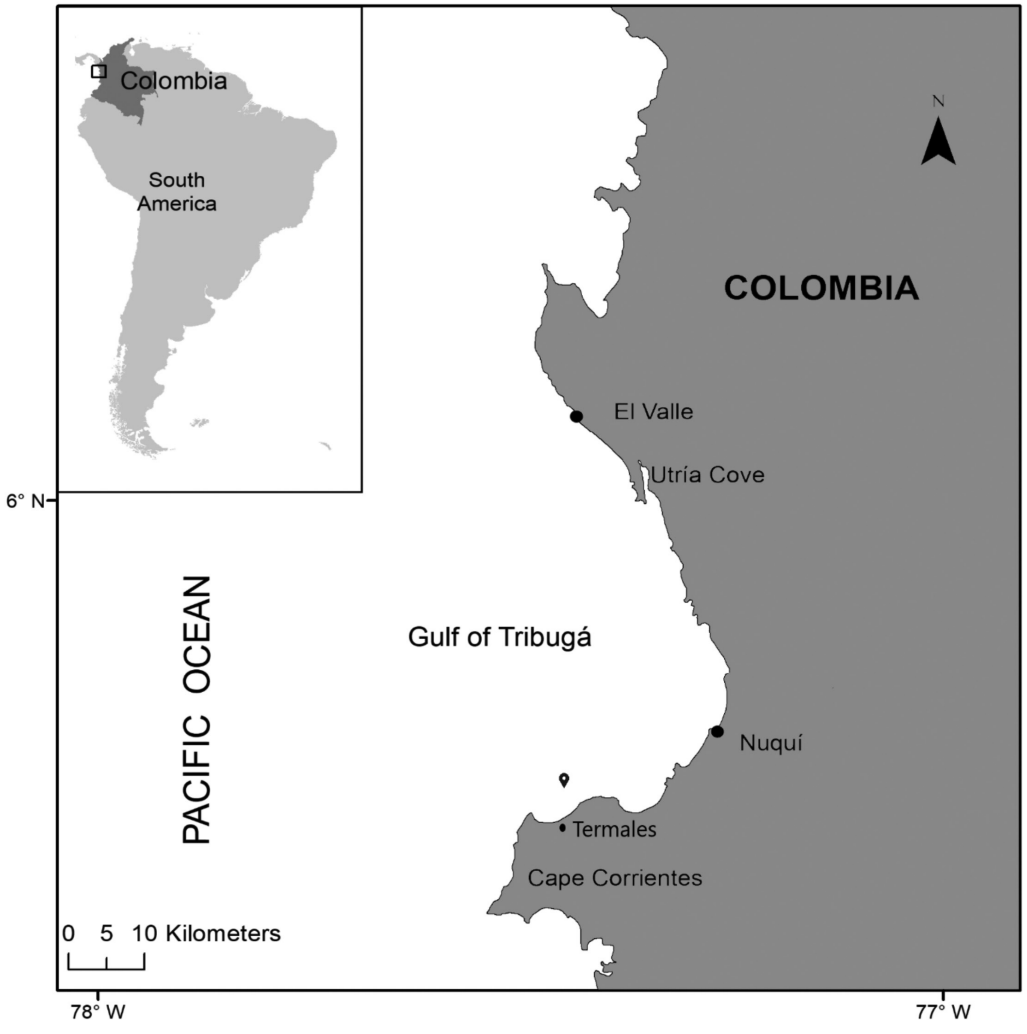

Figure 1. Geographic position of where a humpback whale (*Megaptera novaeangliae*) was observed playing with an inanimate (driftwood) object in the Gulf of Tribugá (northern Colombian Pacific)

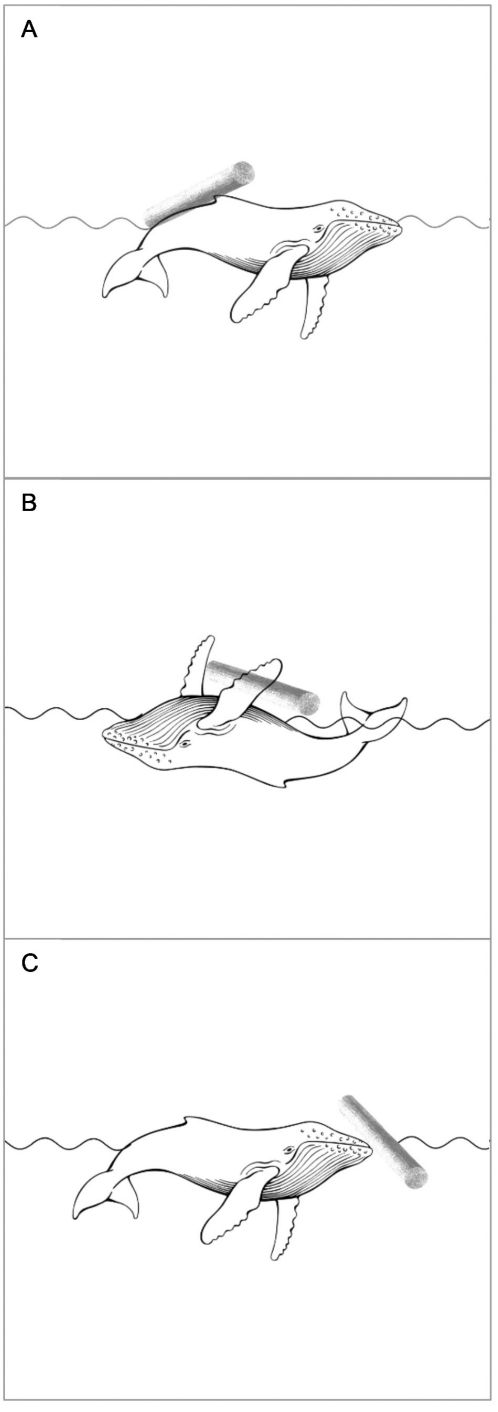

Figure 2. Graphic description of a young humpback whale playing with driftwood: (A) inanimate object on its back close to the dorsal fin; (B) object on the ventral side around the pectoral fins; and (C) whale pushing driftwood with its rostrum. (Sketches created by Ann Carole Vallejo)

boat, and no other boats were present. The behavior was observed for almost 11 min. The sighting ended at 1120 h.

This behavior meets at least three criteria for play categorization in animals suggested by Burghardt (2005): (1) it was voluntary and seemed pleasurable or self-rewarding; (2) it was different from more serious behaviors in that it was exaggerated, precocious, or incomplete; and (3) even though during the observation start the juvenile was already interacting with the driftwood, the animal did not seem stressed or hungry and appeared healthy. This kind of behavior has been observed in other cetaceans, mainly in odontocetes, such as dolphins, but a few object play observations have been reported for mysticetes (Parra, 2007; Owen et al., 2012; Shea & Gallagher, 2021).

Studies on wild and captive dolphins suggest that individuals have the capacity to carry animate and inanimate objects on their rostra, melons, fins, and tail flukes (Miles & Herzing, 2003; Kuczaj & Yeater, 2007; Parra, 2007). Object manipulation has a range of functions (Smolker et al., 1997; Parra, 2007), including socio-sexual displays (Martin et al., 2008), epimeletic behavior (Fertl & Fulling, 2007), and object play (Payne, 1972; Würsig et al., 1989; Bloom, 1991; Miles & Herzing, 2003; Greene et al., 2011). For example, functional behavior has been observed in bottlenose dolphins (*Tursiops truncatus*) carrying objects on their rostrum and on the melon, pectoral flippers, and tail flukes in Shark Bay, Western Australia, and in England, respectively (Bloom, 1991; Parra, 2007). Courtship behaviour has been observed with aquatic plants and balls of clay (Martin et al., 2008). Play behaviour was studied for captive bottlenose dolphins from the Roatan Institute for Marine Science on Roatan, Honduras, and for wild Atlantic spotted dolphins (*Stenella frontalis*) from near Bimini, The Bahamas; these object play interactions found that the captive dolphins played with biological debris, human-made objects, inanimate objects, and trash while wild dolphins interacted more with the sand (Greene et al., 2011). Atlantic spotted dolphins (Miles & Herzing, 2003) and rough-toothed dolphins (*Steno bredanensis*; Kuczaj & Yeater, 2007) have been documented carrying seagrass. In Patagonia, Argentina, killer whales (*Orcinus orca*) play with their prey, throwing prey in the air and recapturing it again, repeating this activity a couple of times for each prey item (Lopez & Lopez, 1985).

Among baleen whales, southern right whale (*Eubalaena australis*) calves in Patagonia have been observed manipulating seaweed with their heads and flippers (Payne, 1972). In Australia, juvenile and subadult humpback whales grasp seaweed in their mouths and drape it over their backs and

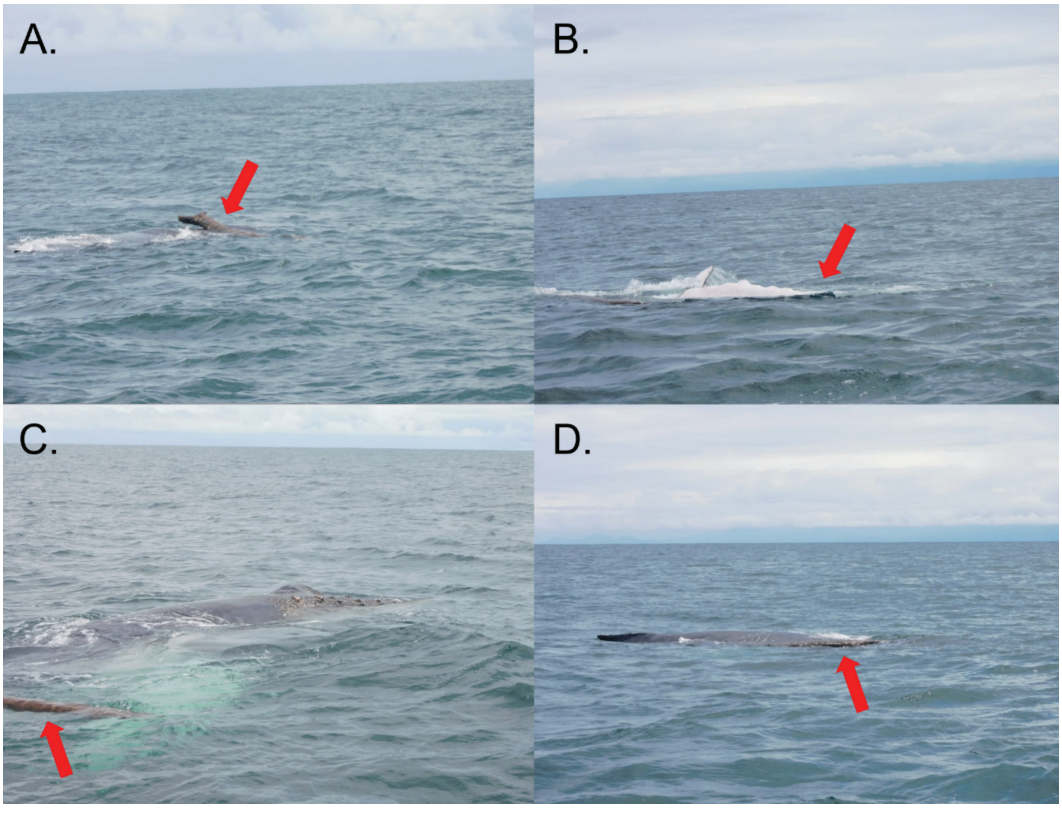

Figure 3. Photos of a young humpback whale playing with driftwood in the Gulf of Tribugá (northern Colombian Pacific): (A) the humpback carrying driftwood on its back; (B) the whale with driftwood on its ventral side and by its right pectoral fin; (C) the humpback with driftwood by its right pectoral fin; and (D) the whale nudging driftwood by with its rostrum. Red arrow in all frames shows driftwood position. (*Photo credit:* Yerson González Murillo)

pectoral fins (Owen et al., 2012). In Hawaii, a juvenile female humpback whale was observed manipulating a big piece of cargo net; over the course of an hour, it passed the net between its pectoral fin to its rostrum repeatedly (Deakos et al., 2010).

A recent study off New England recorded an encounter between a humpback whale and a large lion's mane jellyfish (*Cyanea capillata*; Shea & Gallagher, 2021). Even though manipulation of the jellyfish was similar to how the humpback manipulated the driftwood in this event, the purpose might have been different. Detailed observation of the jellyfish manipulation by the whale's fins and rostrum suggested a purpose that was potentially therapeutic, specifically for wound healing or parasite removal (Shea & Gallagher, 2021), which was not indicated with the driftwood interaction here.

Observations reported here were similar to those made by Würsig et al. (1989) of bowhead whales (*Balaena mysticetus*) in the Beaufort Sea. During 1981, 1982, and 1984, bowhead whales were observed playing with an organic item—a log, ~20 m long—from 5 s to 1.5 h. Most interactions with logs consisted of whales nudging or pushing them with their head or body, manipulating the logs with flippers while belly-up underneath the logs, or lifting the log with the back or tailstock (Würsig et al., 1989). Additionally, there was a news report in British Columbia near Comox Harbor (retrieved 22 April 2022): a ~4-y-old humpback whale was seen playing with a log, and its behavior was referred to as logging or resting. The interaction was described as the whale repetitively going back and forth, diving with a large log, lifting it onto her head, and actively playing with it (Zimmer, 2018).

In the Gulf of Tribugá, the young humpback was observed doing the same behavior as described for bowhead whales (Würsig et al., 1989), nudging or pushing, lifting, manipulating, and moving with and around the driftwood. It has been suggested that this type of behavior may provide a mechanism by which young animals perfect motor skills

via practice, which can facilitate the development of flexible problem-solving skills by providing animals a safe context to explore the consequences of new behaviors (Kuczaj & Makecha, 2008). In addition, the manner in which these whales interact with logs/driftwood seems to be similar to that seen in bouts of sexual behavior (Würsig et al., 1989) and maternal discipline (Payne, 1995).

Many cetaceans have shown high cognitive capacity, behavior plasticity, and learning capabilities (Patterson & Mann, 2015); and while some behaviors may be better understood than others in humpback whales, the few examples of innovative object use in mysticetes suggest we have more to learn about their behavioral subtleties (Paulos et al., 2010; Shea & Gallagher, 2021). The study of play in cetaceans is made difficult because of their aquatic lifestyle. Observations of wild cetaceans are limited to surface behavior, although there are exceptions (e.g., Brunnick, 2000; Dudzinski et al., 2009). Therefore, inclusion of trained local communities in sampling efforts, particularly in developing countries where long-term monitoring programs have not been established, gives us the opportunity to monitor more frequently areas with gaps about cetacean occurrence and behavior. As a result of these observations of play behavior, the scope of knowledge regarding the social dynamics, developmental processes, flexibility, and cognitive abilities of cetaceans has been expanded.

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