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A mass stranding of buoy barnacles, *Dosima fascicularis*, on the Isles of Coll and Colonsay, Inner Hebrides, Scotland, in July 2020

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Goose barnacles of the family Lepadidae are enigmatic creatures that live mostly attached to floating objects drifting in oceanic waters. They can be transported considerable distances by oceanic currents such as the Gulf Stream and North Atlantic Drift, which bring them to British and Irish waters (Trehwella & Hatcher, 2015). They may also occur on ship hulls (Marine Biological Association, 1957; Evans, 2000) but are more usually encountered when cast ashore attached to driftwood or man-made flotsam, especially along the Atlantic facing coastlines of Scotland, Ireland and south-west England.

Washed up branches may be festooned with goose barnacles and their coincidental superficial resemblance to geese led to their common name and the myth of the existence of barnacle trees. In times past it was believed that barnacle geese, then unknown to nest in Britain, actually hatched from these goose barnacles as illustrated in medieval bestiaries (Lappo *et al.*, 2019). The specific names of two of the commoner goose barnacle species - *Lepas anserifera* and *L. anatifera* (meaning goose-bearer and duck-bearer respectively) - allude to this mythology.

Occasionally goose barnacles, notably the species of the genus *Conchoderma*, may attach to marine animals including fish, whales, dolphins and turtles. *Conchoderma* spp. are unusual among barnacles in having no, or a very reduced, armament of shell plates (Marine Biological Association, 1957; Berrow *et al.*, 2010; Chan *et al.*, 2021; O'Reilly *et al.*, 2022). One species of pedunculated barnacle, *Pollicipes pollicipes*, belonging to the family Pollicipedidae, attaches to intertidal rock, on exposed coasts battered by waves. It is very rare in the U.K., being confined to a few sites in Cornwall, but is more frequent in Spain and Portugal where it is harvested and sold as “percebes”, an expensive seafood (Southward, 2008).

Unlike *Pollicipes* and the many species of pedunculated barnacles from deeper waters, true goose barnacles, i.e. those of the genus *Lepas*, almost all

attach on floating objects, which can be either floating free or attached, such as anchored ships and buoys. It is an interesting fact that in tropical seas almost any floating object, even the smallest ones, are almost immediately colonised by *Lepas* species, attaching as the cypris larvae that are common to all barnacles (Chan *et al.* 2021). It was indeed the presence of such larvae, including the naupliar stages that precede the cyprids, that first provided evidence that barnacles are crustaceans. Until then they had been classified as Mollusca together with gastropods, bivalves and cephalopods (Høeg & Møller, 2006).

We emphasise here that the name “goose barnacles”, also called “stalked barnacles”, does not encompass a natural (monophyletic) unit, but refers to the possession of a long, flexible stalk or peduncle. This is in contrast to “acorn” barnacles (Balanomorpha), which do represent a monophyletic group characterised by, among other traits, the absence of a peduncle (see Chan *et al.*, (2021) for a recent account of the biology and relationships of all barnacles).

While JM was visiting the Isle of Coll, Scotland between 20th July and 2nd August 2020, numerous goose barnacles were observed cast up on all the beaches on the west coast of the island. The beaches, facing the Atlantic, comprised sandy bays with dunes at the back and often rocky stretches on either side. No barnacles were seen at Arinagour beach on the east side of the island.

The biggest accumulation of goose barnacles on the west coast was at Hough Bay, with thousands of clumps of dead and decaying barnacles found on the tide-line, all the way along the beach for hundreds of metres. Many of the barnacles seemed to have been there at least a few days, possibly more, as many of the shells were empty, and very fragile. There was no sign of birds feeding on them and no other animals were observed washed up with them. The weather at the time was sunny and warm enough to swim, albeit with the usual wind on the island. The goose barnacle clumps that were washed into rock-pools were still alive, and some were actively trying to feed. The clumps ranged in size from one or two barnacles up to grapefruit sized clusters. Unfortunately, no photos were taken to help confirm the identity of these goose barnacles. Coll residents had also noticed the cast-up barnacles, and it was reported that the barnacles had been washing up all over the island for at least several days.

Around the same time, AM was visiting the nearby Isle of Colonsay and ventured to Kiloran Bay on 28th July 2020. The weather was sunny with some cloud and a gentle onshore westerly breeze, but there had been some windier weather a few days earlier. On this day many seabirds were noticed scavenging along the tide-line and clumps of goose barnacles were seen in abundance. The bay is approximately 800 m wide, and

the goose barnacles were spread across its full width, probably numbering tens of thousands. They were mostly scattered across the sand at the high-water line, but some were found in a rock-pool at the south-west end of the bay and a clump of these was photographed (Fig. 1). The goose barnacle specimens can readily be identified as the buoy barnacle (*Dosima fascicularis*) due to the thin translucent shell plates, the white cuticle between the plates, and the angular shape of the rear carina plate (Broch, 1959; Southward, 2008). Buoy barnacles have a short stalk, about 2 cm long surmounted by the shelled capitulum which is up to 4 cm in length. They are unusual in that they produce their own float. The larval buoy barnacles initially attach to flotsam but then secrete their own pumice-like buoy to which several barnacles may become attached to form a cluster. The white float is clearly visible in the Colonsay barnacle cluster which has formed on a piece of knotted wrack (*Ascophyllum nodosum*) (Fig. 1).



Fig. 1. Clump of buoy barnacles (*Dosima fascicularis*) attached to their float. Colonsay, Scotland, July 2020. (Photo: Andrew Morris)

Regarding systematics, *D. fascicularis* may need to be transferred to the genus *Lepas*. Recent molecular analyses reveal that it is nested within species of *Lepas*.

Thus, from a modern systematic point of view it no longer warrants status as a separate genus, its structural peculiarities notwithstanding (see Chan *et al.*, 2021). Its remarkable flotation device has recently been subject to very detailed study (Zheden *et al.*, 2015).

It seems probable that all the goose barnacles on Coll were also buoy barnacles (*D. fascicularis*). The observations of numerous goose barnacles, stranded on two Inner Hebridean islands, around the same time in July 2020, points to a single extended mass stranding event of a huge swarm of buoy barnacles, driven shorewards from their usual abode out in open waters of the Atlantic Ocean.

Buoy barnacles have been widely recorded on the north-western seaboard of Scotland, with records from Shetland, Fair Isle, Sutherland, the Western Isles, Skye and Rum (NBN, 2022). There are no records currently shown in the NBN Atlas for the islands of Coll and Colonsay although it is quite probable that they are cast ashore here from time to time in small numbers. Mass strandings, as happened in July 2020, are undoubtedly a much less frequent spectacle that bring these enigmatic denizens of the ocean to the attention of holiday-makers and beachcombers. The prevalence of phone cameras and websites and forums (e.g. <https://www.aphotomarine.com>; <https://www.glaucus.org.uk/>) aiding the identification of fauna found washed up on our shores should help to gauge the frequency of these unusual occurrences.

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