All aboard!

Perez, P.H., Infante Sanchez, M. & Izaguirre Laeoste, M. (2009). On the use of mosses in the building of a XVth century ship in Northern Spain. *Cryptogamie Bryologie* **30**, 177–184.

During channelling works at the mouth of the river Oka near the village of Gernika in the Basque country, the remains of a wooden boat were found in the mud. The remains were named the *Urbieta* wreckage and are preserved in the Ria de Bilbao Maritime Museum.

Archaeological reconstruction showed that the boat was of wooden clinker construction (i.e. with overlapping planks) and was about 11 m long and 2.8 m wide. It has been dated to 1450–1460. During cleaning, masses of plant material, identified as moss, was discovered.

The moss had been formed into clumps in a kind of resin matrix. This was dissolved in 10% potassium hydroxide so that the individual plants could be identified. A total of eight species were found (*Eurhynchium striatum*, *Hylocomium splendens*, *Hypnum cupressiforme*, *Kindbergia praelonga*, *Neckera complanata*, *Pseudoscleropodum purum*, *Rhytidiadelphus triquetrus* and *Thuidium tamariscinum*), the bulk of which was made up of three large pleurocarps: *H. splendens*, *R. triquetrus* and *T. tamariscinum*. All of the species found grow in the region, and appear to have been collected deliberately and mixed with a resin to form a caulking material to fill gaps between the hull planks. Large pleurocarps are quite 'spongy' and would absorb resin well, making an effective gap filler.

The use of mosses to caulk ship's planks is quite well known in northern Europe, where it was used from the Bronze Age to the Middle Ages. However, this is the first report of such a use from Spain.

Mosses and ants

Rudolphi, J. (2009). Ant-mediated dispersal of moss propagules. *Bryologist* **112**, 73–79.

Bryophytes producing asexual propagules need to have some sort of dispersal mechanism if they are to spread. J. Rudolphi has carried out two laboratory experiments with *Aulacomnium androgynum*, which produces abundant asexual propagules (gemmae), and the ant *Lasius platythorax*. The first experiment was designed to determine if the propagules would adhere to the ants, and the second to see how long they remained attached.

In experiment 1, the author put tufts of the moss into eight Petri dishes; four tufts were sprayed with water; the others were left dry. Eight ants were released into each dish and allowed to run around on the moss for 30–120 seconds. They were then removed and examined for adhering gemmae.

In experiment 2, two gemmae were attached to each of 45 ants. The ants were divided into groups of nine, put into Petri dishes and kept for periods of 0, 1, 2 4 or 8 hours, after which they were frozen and examined for remaining gemmae. The 0 hour group were the control to see how many gemmae were lost during handling.

Rudolphi found that gemmae adhered to 33% of the ants. Comparing the results from the wet and dry moss showed that up to five times more gemmae per ant adhered in dry moss than wet. This was thought to be caused by capillary action in the wet moss causing the gemmae to cling to each other rather than to the ants. The second experiment showed that after 2 hours, an average of one gemma remained attached to the ants. After 8 hours, 24% of ants still had at least one gemma attached.

If these results are replicated in the wild, the ants could indeed disperse the gemmae. The exact dispersal distance is unclear, but it is known that the ant has colonies spread over several tree stumps so the gemmae could be carried from one stump to another.

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