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ANNOUNCEMENT

# BARNACLE SAMPLES FROM THE INDIAN OCEAN REQUESTED TO UNDERSTAND THE ROUTE OF THEIR ATLANTIC INVASION

MARK A. ROBERTS[1] AND NADÈGE ZAGHDOUDI-ALLAN[2]

[1]Department of Biological Sciences, University of South Carolina, USA

[2]Center of Marine Sciences (CCMAR), University of Algarve, Portugal

robertm2@email.sc.edu

Dear IOTN readers,

We have been conducting research on the sea turtle specific barnacle, Stephanolepas muricata. Sea turtles are known to host diverse communities of epibiota by providing the substratum needed for their attachment. S. muricata is an embedding barnacle specific to cheloniid sea turtles and was previously believed to be restricted to the Indo-Pacific. However, the species was discovered relatively recently in the Atlantic Ocean (Frick et al., 2011). Individuals are relatively difficult to detect in the field and little is known about the dispersal behaviour of S. muricata, making it difficult to establish whether its newfound presence in the Atlantic is the result of a recent invasion or perhaps simply a lack of historical documentation.

To address these questions, we have begun a global genetic study that aims to determine possible routes of invasion into the Atlantic, as well as if the barnacle exhibits host species specificity. We also hope to better understand the transmission and potential gene flow in these barnacles between populations and across host taxa. By comparing the population genetic structure of this species and its host, it may be possible to infer non-reproductive connectivity between turtle populations (e.g. on feeding grounds) and, potentially, pathways of infection between turtle species with non-overlapping niches.

Unfortunately, we are lacking any samples from the Indian Ocean- which is a key component of addressing these questions. If anyone encounters these in the field, we would be very grateful if you could let us know via email. We have put together a fact sheet about the barnacle, and how to store any specimens you might collect. You can access the fact sheet at this web address: http://tinyurl.com/hfsoecv. Please email Mark A. Roberts (robertm2@email.sc.edu) or Nadège Zaghdoudi-Allan (nadegeallan@gmail.com) for further information.

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RESOURCE OF INTEREST

# LOW-COST LABORATORY METHODS FOR FINDING MICROPLASTICS IN ENVIRONMENTAL SAMPLES

ANDREA D PHILLOTT# & MATHURA BALASUBRAMANIA

Asian University for Women, Chittagong, Bangladesh

#andrea.phillott@auw.edu.bd

Studies on microplastics usually require the contaminant to first be isolated from the sample substrate by density separation and removal of organic matter (reviewed by Cole *et al*. (2014) and Tagg *et al*. (2015)) before sorting from other materials in the filtrate, counting the number of microplastics, and identifying the type of plastic if possible. While the easiest and cheapest method of separating microplastics is by visual sorting using light microscopy, small plastic fragments or fibers can be difficult to see. The most accurate methods involve Fourier transform infrared spectroscopy (FT-IR, specifically reflectance micro-FT-IR or 'molecular mapping'), pyrolysis gas chromatography coupled to mass spectrometry (pyrolysis GC/MS), Raman spectroscopy, and fluorescence microscopy (see Hidalgo-Ruz *et al*. (2012) and Tagg *et al*. (2015)). However, these processes are time consuming and the equipment is expensive to purchase. During our studies on microplastics (see Balasubramanian and Phillott on pages 13-16 in this issue of IOTN), we identified some cheaper alternatives.

Fluorescence microscopy (the simplest and cheapest of the methods described above) reduces the risk of underestimating the number of plastic fragments present in samples. A cheaper alternative to a fluorescent microscope is a NIGHTSEA Stereomicroscope Fluorescence Adapter (~US$1,100), which can add *fluorescence* illumination to dissecting microscopes. Six different wavelength sets plus bright light are available; Royal Blue (440-460nm) is being used to identify microplatics (P. Dustan pers.comm., 2016). NIGHTSEA products are distributed by Electron Microscopy Sciences (EMS), and their distributors in the Indian Ocean region and Southeast Asia can be found at http://www.emsdiasum.com/microscopy/company/agents.aspx.

Fluorescence illumination can also be obtained by retrofitting an old light microscope with a brightfield vertical illuminator and very bright low-voltage light emitting diode (LED), although this option relies on the availability of a suitable microscope, vertical illuminator and LED flashlight. Steps to disassemble the vertical illuminator, attach the flashlight and assemble the internal optics are described in Babbitt *et al*. (2013).

Nile Red is a fluorescent dye that is usually used with cell and tissue samples, but is also reported to stain polyethylene, polypropylene and expanded polystyrene (Song, 2014) and may improve isolation of microplastics from samples (Cole et al., 2011) The dye may be added to the sample before filtration (3µg/mL; Desforges *et al*., 2014; 50mg/L, Song *et al*., 2014).

Researchers working in labs without a camera mounted on the microscope may also be interested in the simple cell (mobile) phone camera mount, built using inexpensive and common materials, described by Martin and Shin (2016). The mount ensures the phone camera is positioned correctly with relation to the ocular lens and the beam of light to improve the image quality.

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