



Mar 04, 2026

Extraction of surface-community DNA from macroalgal thalli

DOI

<https://dx.doi.org/10.17504/protocols.io.8epv55p54v1b/v1>

Torsten Thomas¹

¹University of New South Wales, Sydney, Australia



Torsten Thomas

Create & collaborate more with a free account

Edit and publish protocols, collaborate in communities, share insights through comments, and track progress with run records.

Create free account

OPEN  ACCESS



DOI: <https://dx.doi.org/10.17504/protocols.io.8epv55p54v1b/v1>

Protocol Citation: Torsten Thomas 2026. Extraction of surface-community DNA from macroalgal thalli. **protocols.io**
<https://dx.doi.org/10.17504/protocols.io.8epv55p54v1b/v1>

Manuscript citation:

Burke, C., Kjelleberg, S. and Thomas, T., 2009. Selective extraction of bacterial DNA from the surfaces of macroalgae. *Applied and environmental microbiology*, 75(1), pp.252-256.

License: This is an open access protocol distributed under the terms of the **[Creative Commons Attribution License](#)**, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited

Protocol status: Working

We use this protocol and it's working



Created: March 04, 2026

Last Modified: March 04, 2026

Protocol Integer ID: 245805

Keywords: selective extraction of bacterial dna, community dna from macroalgal thalli, microbial dna, microscopic check of the macroalgal surface, precipitation of the microbial dna, macroalgal surface, direct lysis of the microbial community, surfaces of macroalgae, bacterial dna, microbial community, extraction of surface, organic extraction, macroalgal thalli, environmental microbiology, extraction, macroalgae, community dna, selective extraction, delisea pulchra, removal of basal part

Funders Acknowledgements:
Australian Research Council

Abstract

This method performs a direct lysis of the microbial community on an macroalgal surface followed by an organic extraction and precipitation of the microbial DNA. The method has been applied to *Ulva* sp. and *Delisea pulchra* and has not been found to damage the tissue. Microscopic check of the macroalgal surface before treatment and removal of basal parts (old and most likely covered by secondary colonisers) is necessary to ensure efficiency. The method has been published in Burke, C., Kjelleberg, S. and Thomas, T., 2009. Selective extraction of bacterial DNA from the surfaces of macroalgae. *Applied and environmental microbiology*, 75 (1), pp.252-256.

Method

- 1 Collect several macroalgal thalli (e.g. *Ulva* sp.) and transfer into bag/container with seawater. T
- 2 Chop the remaining thalli into pieces of roughly 2-4 cm length/width
- 3 Wash the thalli 3 times for 1-2 min with CMFSW; make sure smaller bits and non-algal material get washed away
- 4 Using a balance, weigh out 10-20 g of wet-weight (drip dry) into a petri dish
- 5 Transfer thallus material into a sterile 50 ml Falcon tube with 30 ml of CMFSW and 300 μ l of 3M Multi Enzyme Cleaner (article number 70500).
- 6 Shake gently to make sure the thalli surface is covered with the CMFSW/ cleaner mix and incubate at room temperature. Typically 30-180 min of incubation is enough.
- 7 Check removal of microbial cells and integrity of macroalgal surface by microscopy. If macroalgal surface, then consider using higher dilutions (e.g. 30 or 3 μ l of 3M Multi Enzyme Cleaner in 30 ml of CMFSW). If microbial cells are not removed, then increase incubation time.
- 8 Transfer liquid into 1 or 2 new 50 ml Falcon tubes. Fill tubes with no more than 20 ml and make sure no thalli material is being transferred. Optionally the liquid can be filtered through a sterile 125 μ m sieve or a 0.8 μ m filter
- 9 Add an equal volume of phenol/ chloroform/ isoamylalcohol (25:24:1) to the supernatant and shake gently but thoroughly
- 10 Centrifuge for 5 min at 2,000 x g
- 11 Transfer aqueous phase into a sterile SS-34 tubes (or equivalent)
- 12 Add 1/10 volume of 3M sodium acetate and 3 volumes of 95% ethanol



- 13 Shake gently but thoroughly. A white precipitate may become visible
- 14 Incubate at -20°C for at least 2 hours
- 15 Centrifuge for 30 min at 20,000 x g
- 16 Remove supernatant
- 17 Add 10 ml of ice-cold 70% ethanol to pellet
- 18 Centrifuge for 5 min at 20,000 x g
- 19 Remove supernatant and air-dry pellet
- 20 Resuspend pellet in 0.5 ml sterile water and transfer into 2 ml microcentrifuge tube
- 21 Add 1/10 volume of 3M sodium acetate and 3 volumes of 95% ethanol
- 22 Shake gently but thoroughly. A white precipitate may become visible
- 23 Incubate at -20°C for at least 2 hours
- 24 Centrifuge for 30 min at 20,000 x g
- 25 Remove supernatant
- 26 Add 1 ml of ice-cold 70% ethanol to pellet



- 27 Centrifuge for 5 min at 20,000 x g
- 28 Remove supernatant and air-dry pellet
- 29 Resuspend pellet into 50-100µl TE-buffer (10 mM Tris-HCl, 1 mM EDTA, pH 8.0)
- 30 Check appr. 1 µl of extracted DNA on agarose gel