Supplementary information

Addition of granular activated carbon during anaerobic oleate degradation overcomes inhibition and promotes methanogenic activity

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Sample preparation for LCFA quantification

Samples for LCFA extraction and esterification were prepared following Guihéneuf et al.[1] with modification following the steps below:

- Entire bottle content after samples are taken for VFA measurement were lipolyzed using a freeze dryer at -56 °C and 0.050 mbar for 1 week using a freeze dryer L-200 basic with Edwards nXDS6iC dryscroll vacuum pump (Buchi, Mason Technology).
- Freeze dried solids were then collected and dissolved in 3 ml hexane and 0.3 ml HCl [1 M].
- 0.9 ml of the hexane sample from the previous step was taken and mixed with 0.1 ml of internal standard (5 g/L pentadecanoic acid in hexane solution), 5 ml methanol and 1 ml 8% HCl-methanol in a glass vial with PTFE protected seal caps.
- Vials were vortexed for mixing and then incubated for 1 h in 100 °C for esterification process;
- After incubation, the vials were cooled down before adding 1 ml hexane and mixed for 20 s.
- 3 ml demineralized H_2O was then added and shake vigorously to stop the reaction,
- Vials were left to stand to allow for the organic-water layer to separate.
- 1 ml from the top layer was taken and used for LCFA analysis.

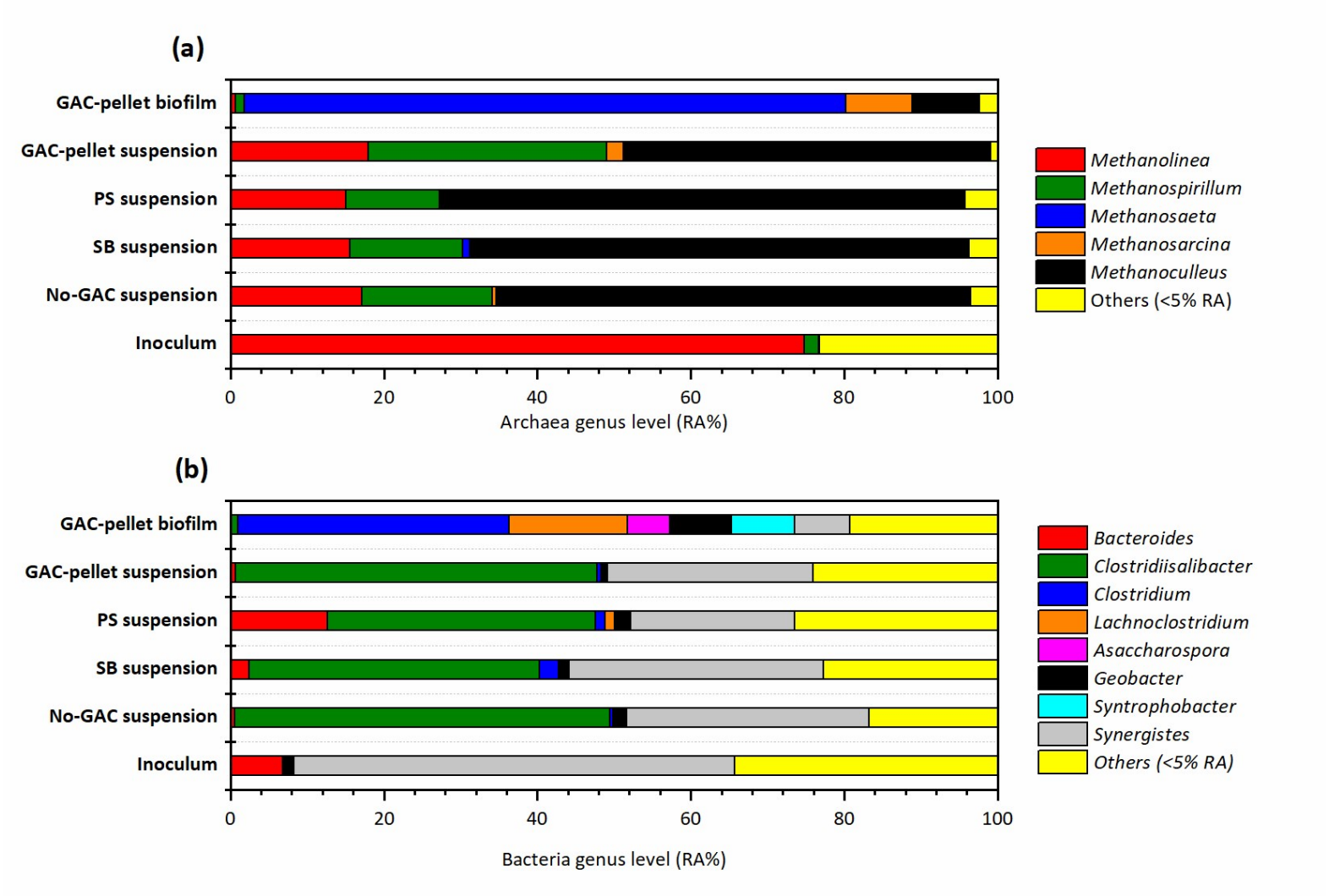

Figure S1 Relative abundance of archaeal (a) and bacterial (b) groups at genus level in the inoculum, suspensions (no-GAC, SB, PS and GAC-pellet) and GAC-pellet biofilm. Sequences with an RA < 5% were grouped together as 'Others'.

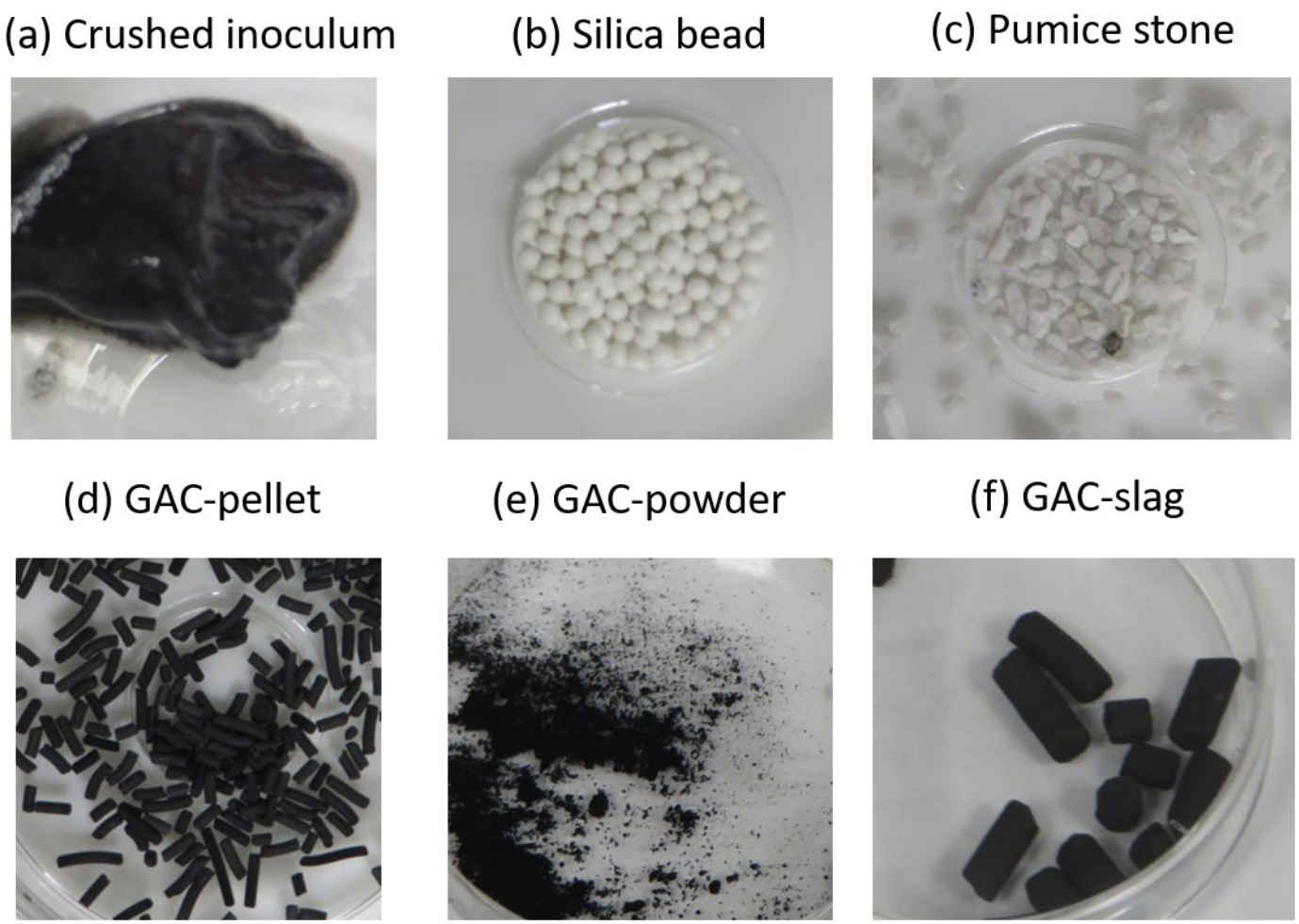

Figure S2 Digital images of inoculum and carrier materials used in this study.

References

1. Guihéneuf F, Schmid M, Stengel DB. 2015. Lipids and fatty acids in algae: Extraction, fractionation into lipid classes, and analysis by gas chromatography coupled with flame ionization detector (GC-FID), p. 173–190. *In* Stengel, DB, Connan, S (eds.), Methods in Molecular Biology. Springer Science, New York, USA.