Supplementary information

Additional file 1

Copper-lignin with laccase-mediated polymerization fixation for wood preservation: determination of durability in marine environment using novel technologies

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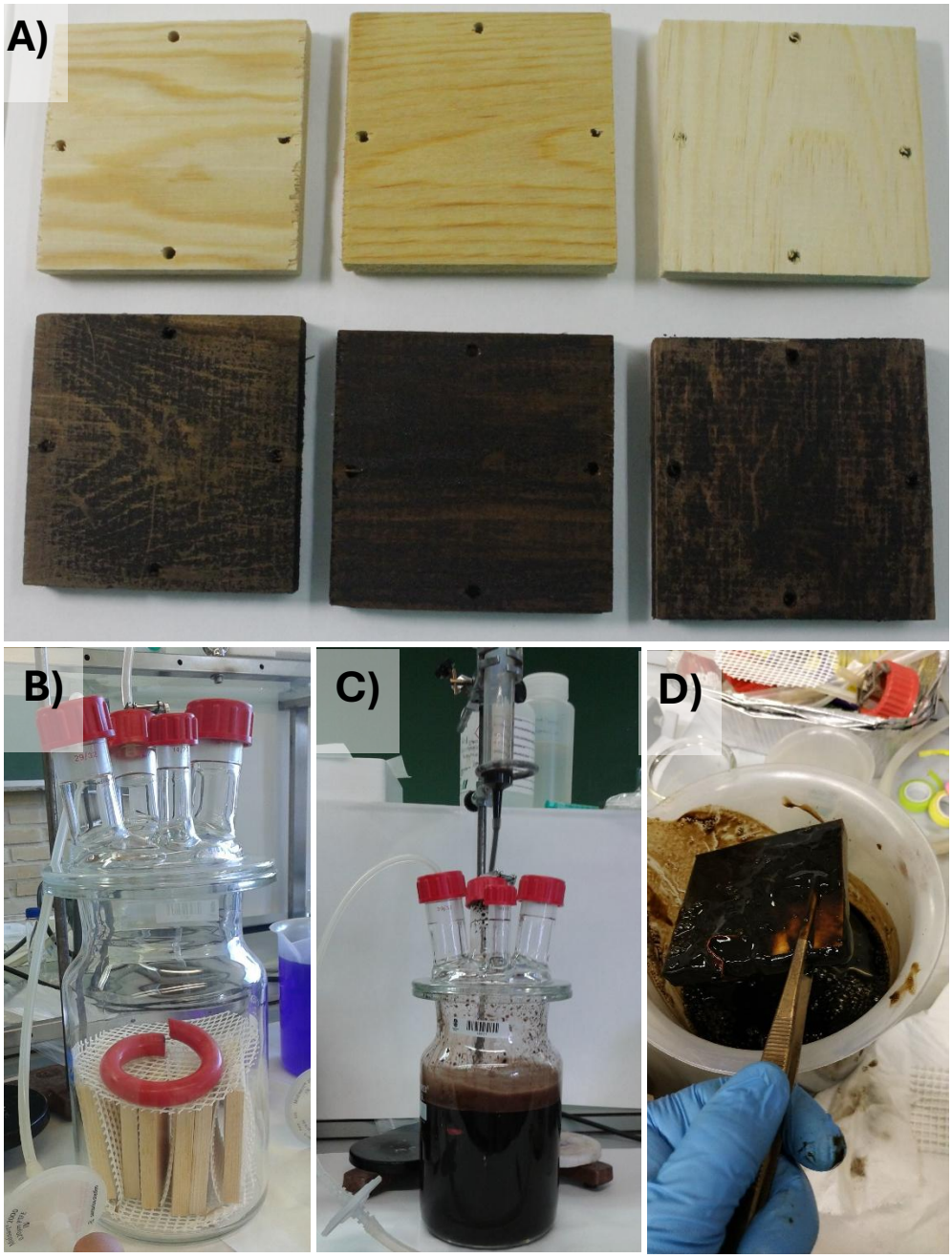

Figure S1. A) Treated Scots pine wood samples of 80x80x10mm size and holes in the edges for attachemnt to the immersion structure. B) Set up for impregnation of wood pieces with plastic mesh to avoid contact between samples and a ballast on top to avoid flotation. C) Loading of treatment solution containing Kraft lignin for impregnation. D) Formation of coagulation in Kraft lignin solution in presence of copper when phosphate buffer was not added.

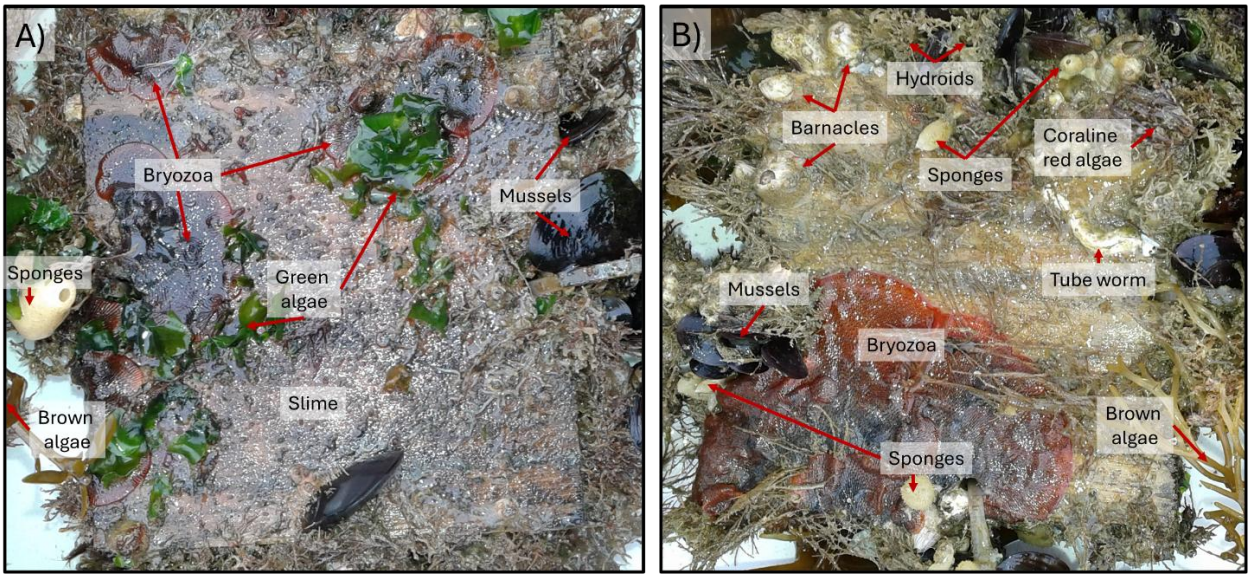

Figure S2. Pictures of biofouling coverage in A) light exposed and B) non-light exposed wood faces. Several fouling organisms are indicated by red arrows and text boxes. The images correspond to 10th of January 2017, 183 days of immersion time.

Figure S3. Piece of KL+LAC treated sample cut in the longitudinal direction. Lignin was concentrated mainly in the first 3 mm from the edge of the radial plane reflected by its dark brown coloration.

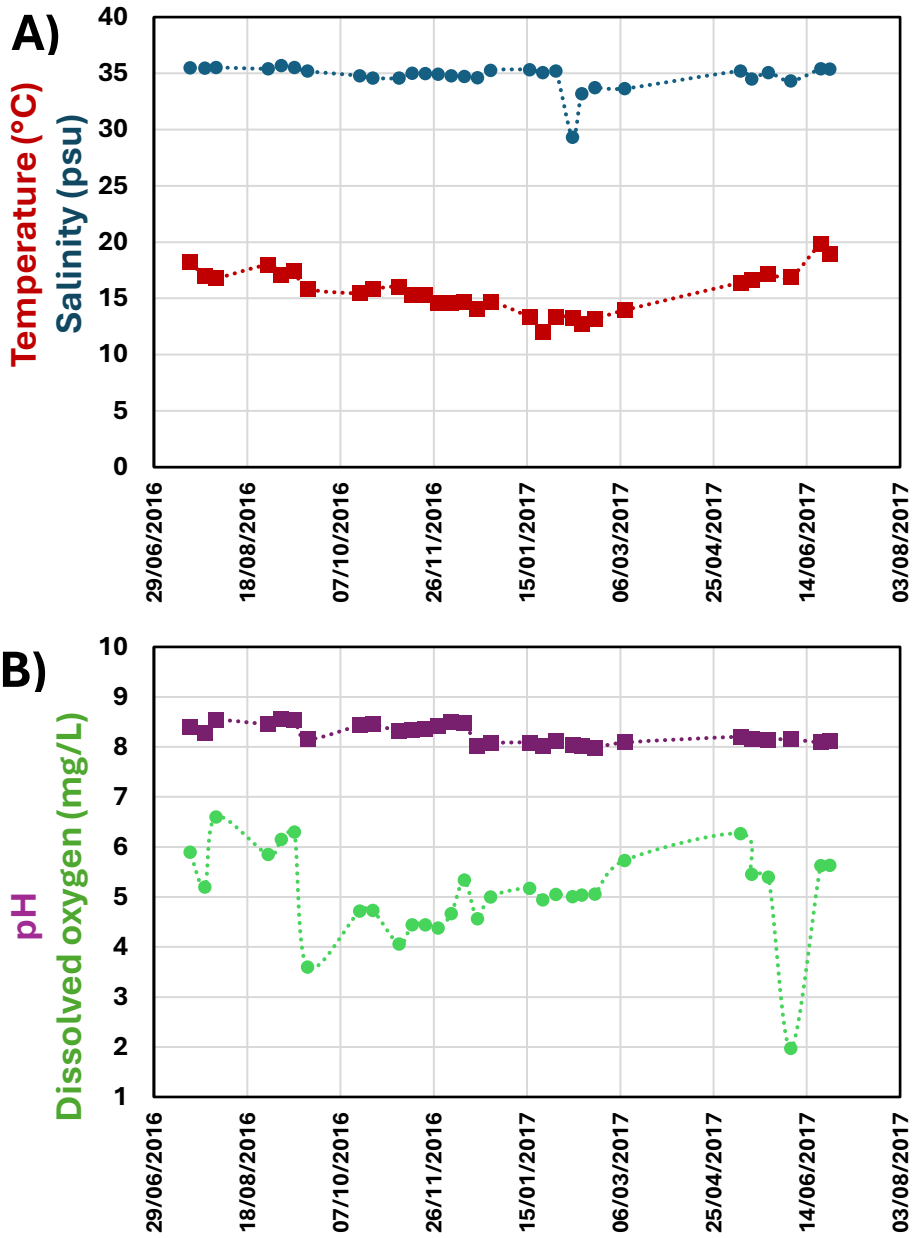

Figure S4. Oceanographic variables from the EF station (42°14.10′N, 8°46.80′W, Vigo estuary) of INTECMAR collected from 11/07/2016 to 11/07/2017 at 2.9-3 m depth. A) Temperature and salinity. B) pH and dissolved oxygen.

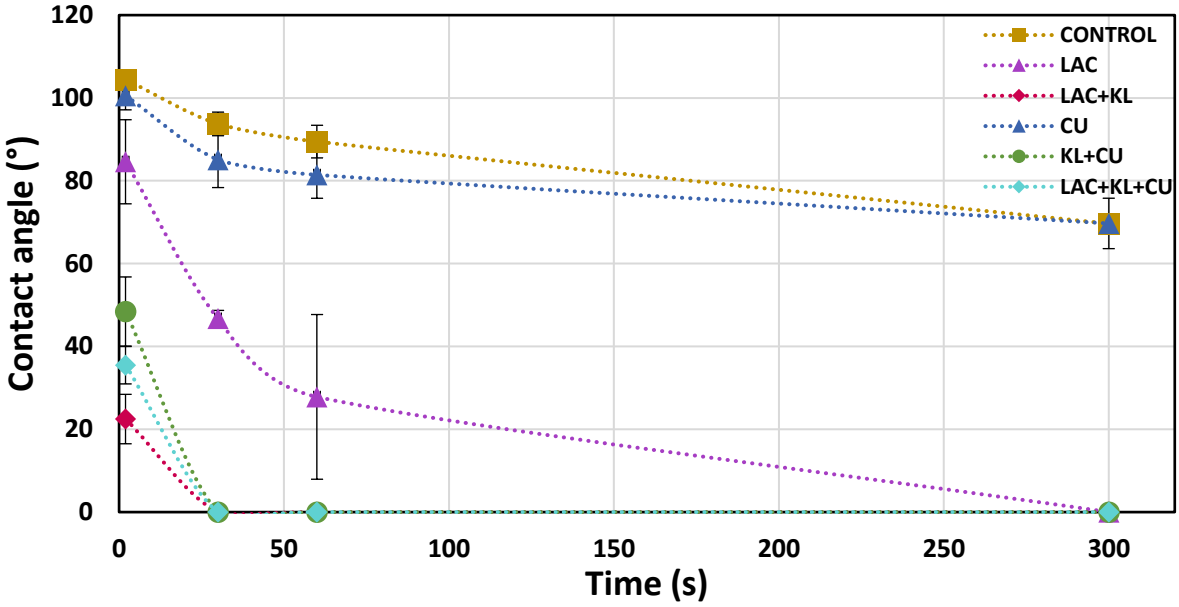

Figure S5. Water contact angle progression along the time (2, 30, 60, and 300 s) from the different wood treated samples. The data was acquired with a Krüss GH11 (Krüss, Germany) goniometer. Error bars indicate the standard deviation of three independent drop measurement replicates. Treatments with laccase and incubation at high temperatures resulted in lower contact angle values, reflecting a reduction of hydrophobicity. Presence of Kraft lignin also reduces contact angle values, probably assisting in wood hydrophobic extractives solubilization.