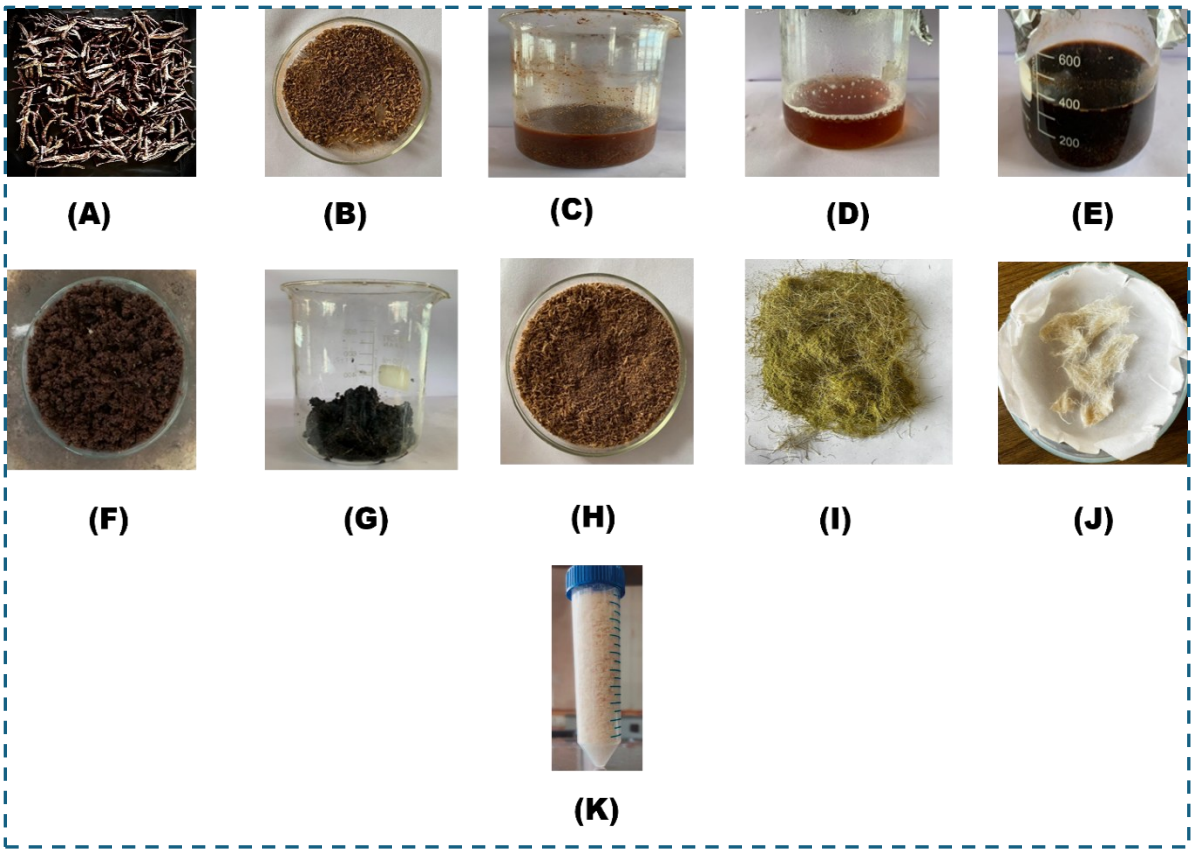

Figure S1. Isolation of cellulose fiber from seagrass. (A) Raw seagrass material. (B) Ground seagrass powder. (C) Alkaline treatment indicating lignin elimination. (D) Intermediate purification phase. (E) Concentrated alkali solution during treatment. (F) Alkali-treated residue after lignin extraction. (G) Bleaching treatment showing removal of residual impurities. (H) Purified cellulose powder. (I) Dried cellulose fibers. (J) Final isolated cellulose product. (K) Cellulose suspension demonstrating uniform nanofiber dispersion.