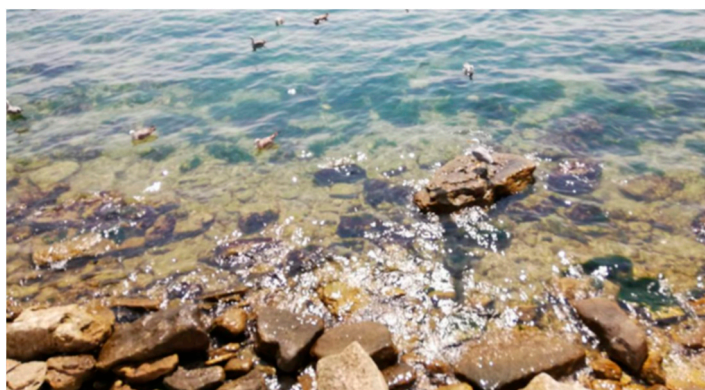


Article

Valorification of *Ulva rigida* algae in pulp and paper industry for improved paper characteristics and filtration of wastewater heavy metals

Florina-Cristiana Caprita^{1,2}, Antoaneta Ene^{1,2,*} and Alina Cantaragiu Ceoromila^{2,3}

Supplementary Material



a)



b)

Figure S1. a). Macrophytes developed at shallow depths; b) Macroalgae wrack collected from Romanian coast, Casino Constanta area.



Figure S2. Wastewater sample from the metallurgical industry used in the filtration experiment



Figure S3. Manual homogenization of the material



Figure S4. Rapid Köthen – sheet former



Figure S5. Laboratory sheets of filter paper with added algae, before drying and after drying



a)

b)

Figure S6. a) Samples of filter paper with added seaweed mass subjected to the filtration process;
b) Residues following filtration

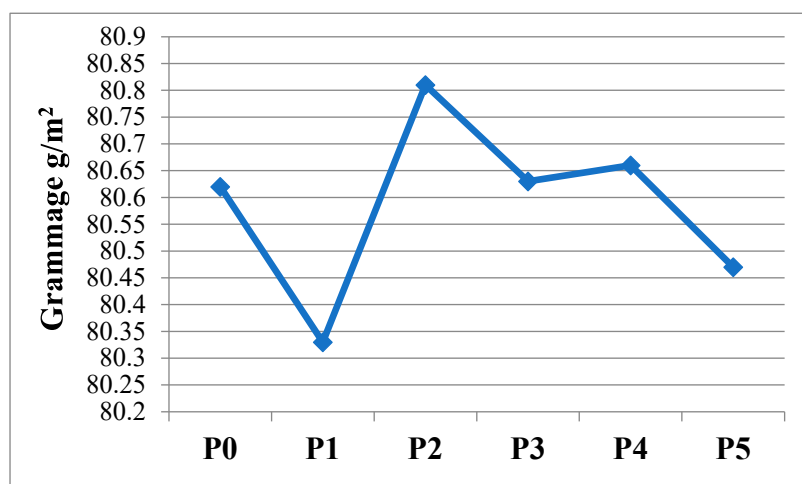


Figure S7. Average grammage determination results

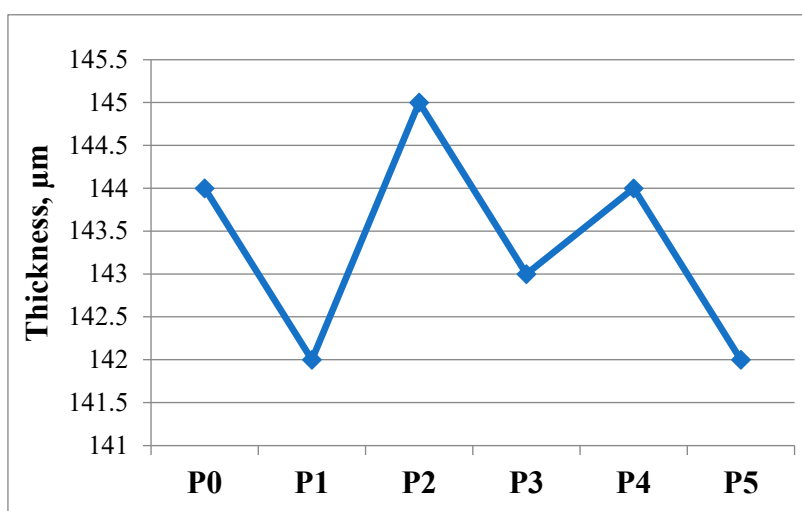


Figure S8. Average thickness determination results

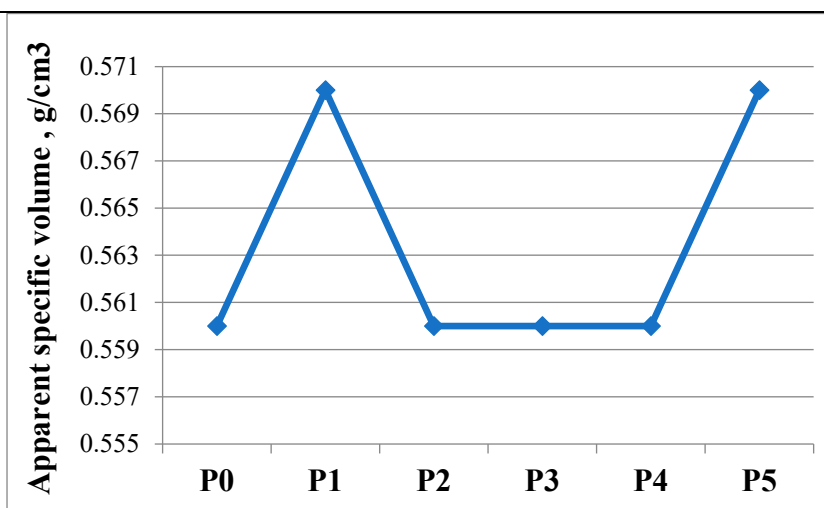


Figure S9. Apparent specific volume determination results

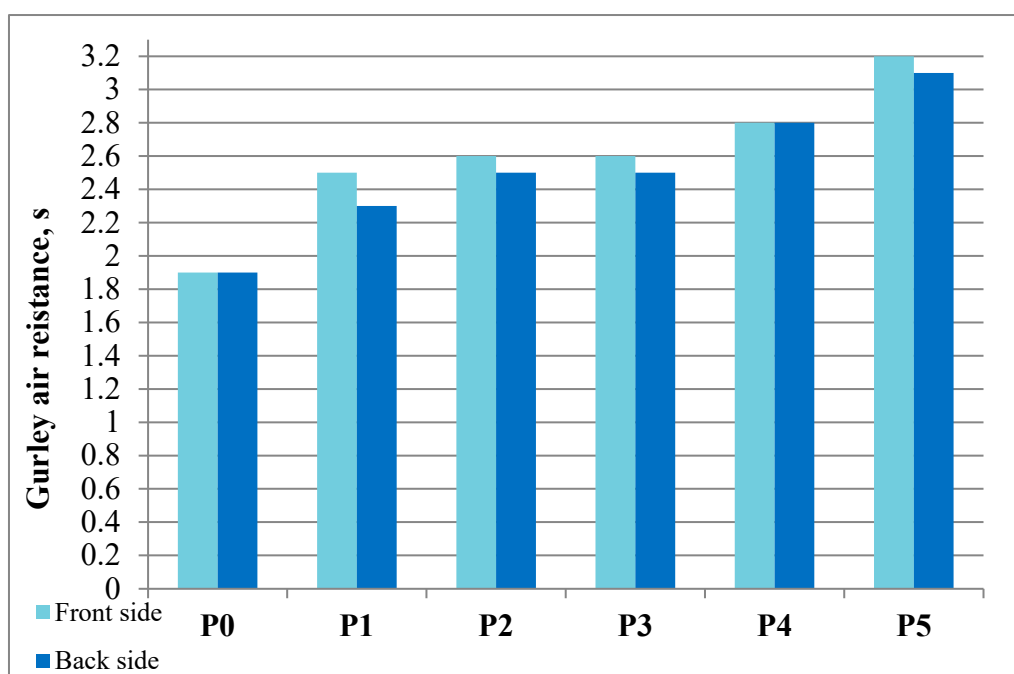


Figure S10. Average permeance determination results

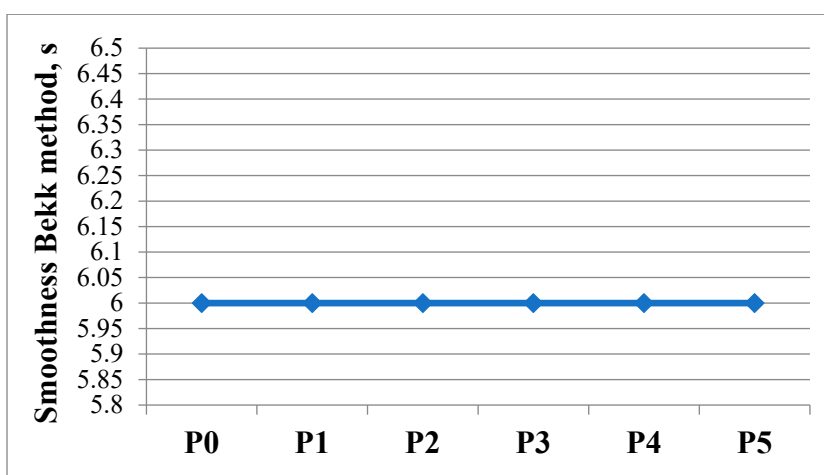


Figure S11. Average smoothness determination results

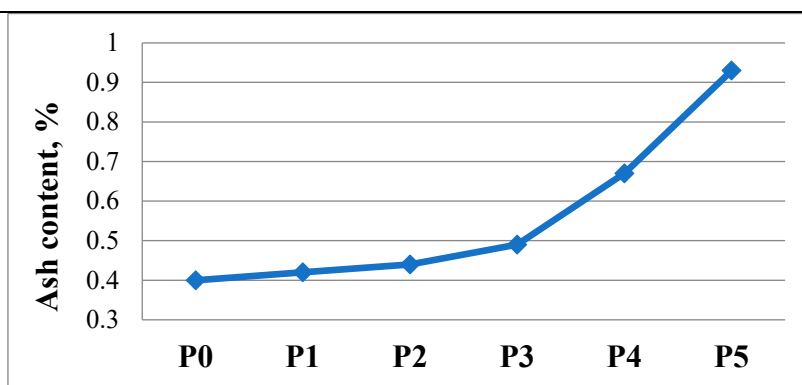


Figure S12. Average results of ash content determination

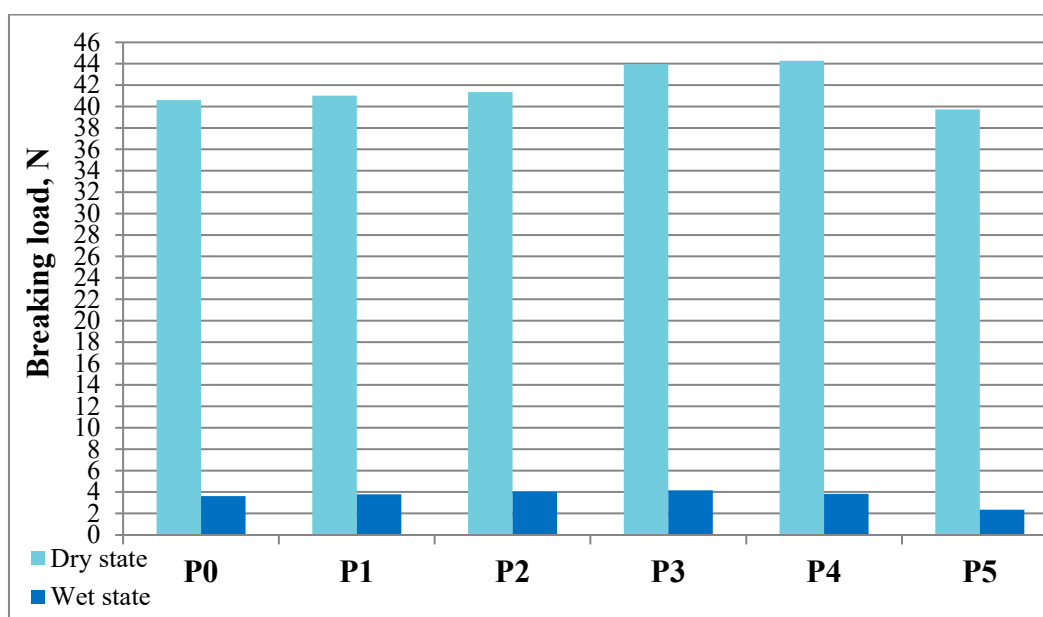


Figure S13. The average results of determining the breaking load

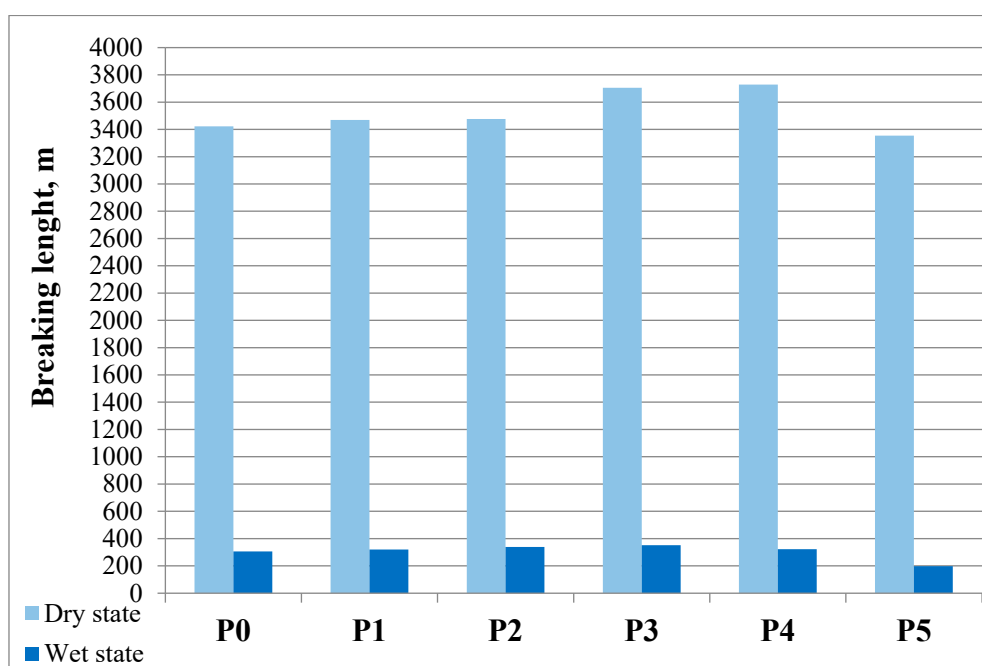


Figure S14. The results of determining the breaking length

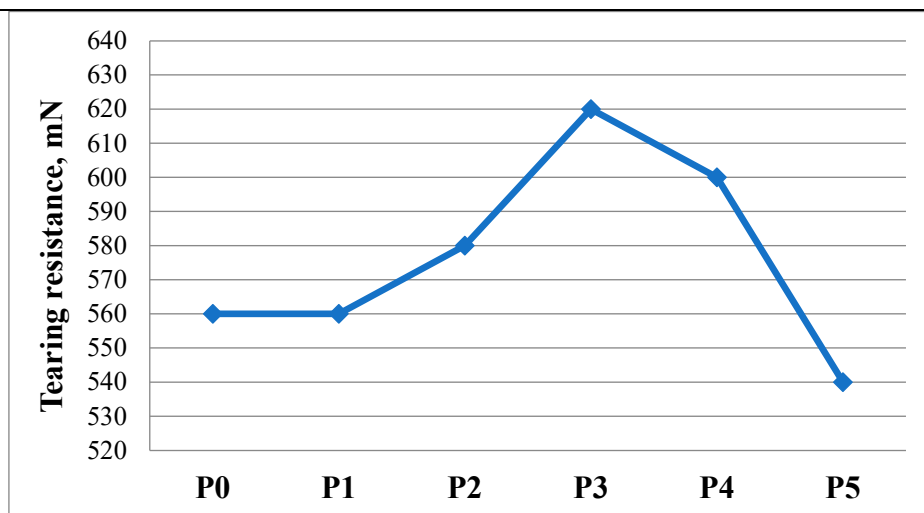


Figure S15. Averages of the results of the determination of tearing resistance

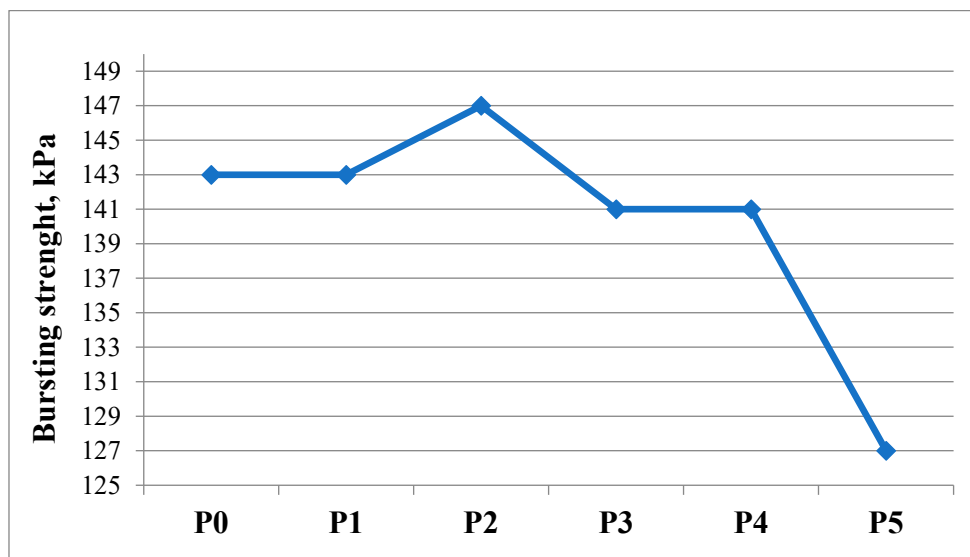


Figure S16. Average results of bursting strength tests

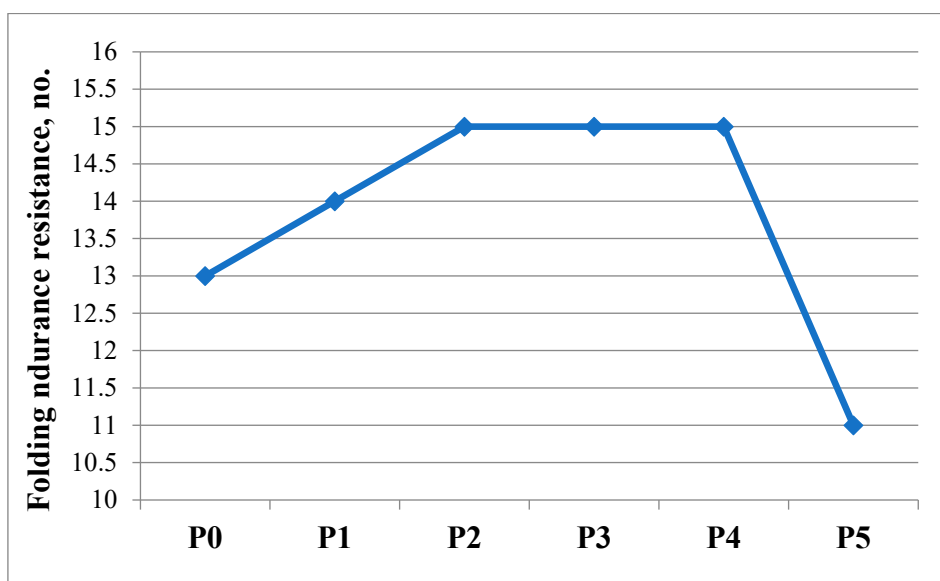


Figure S17. The average results of the folding endurance determinations

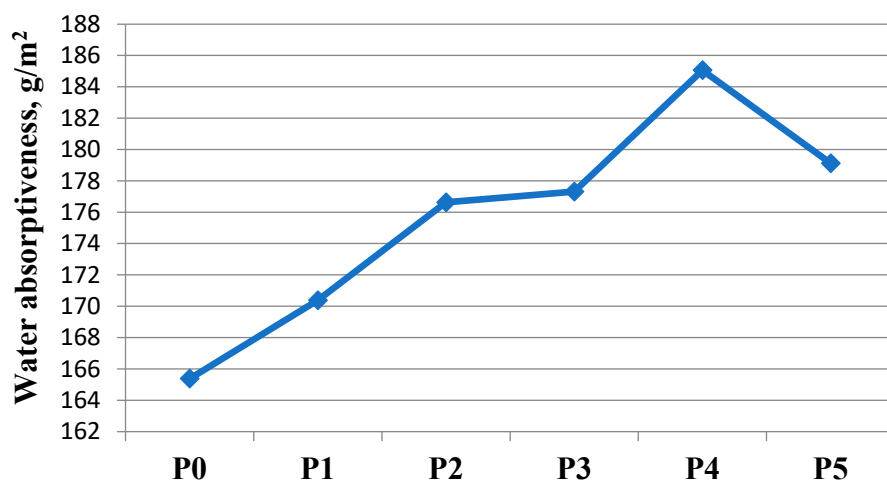
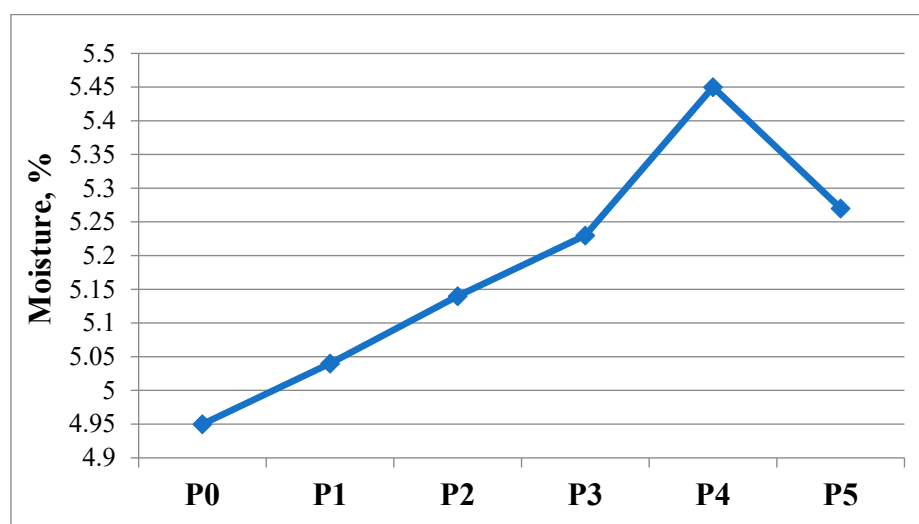
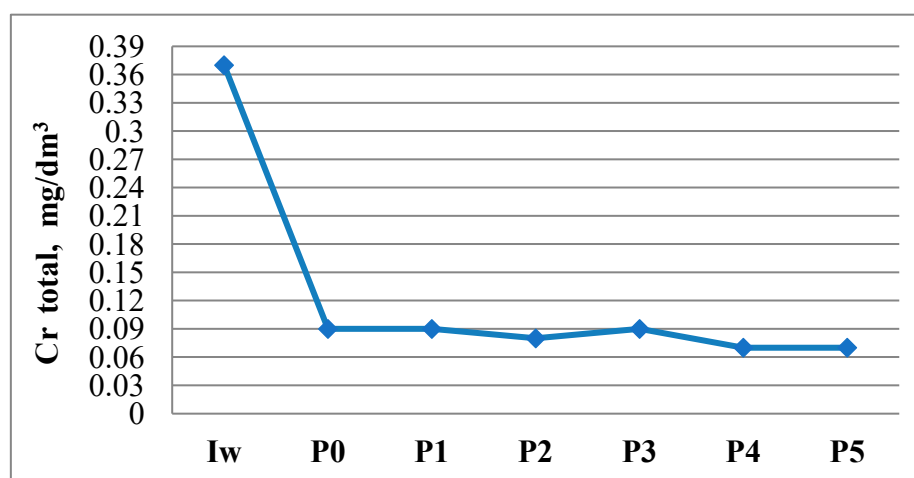
Figure S18. Average results for Cobb₆₀ water absorptiveness

Figure S19. Average moisture determination results

Figure S20. Graphical representation showing the results of Cr total concentrations obtained after wastewater filtration using filter papers with different mass additions of *Ulva rigida* algae

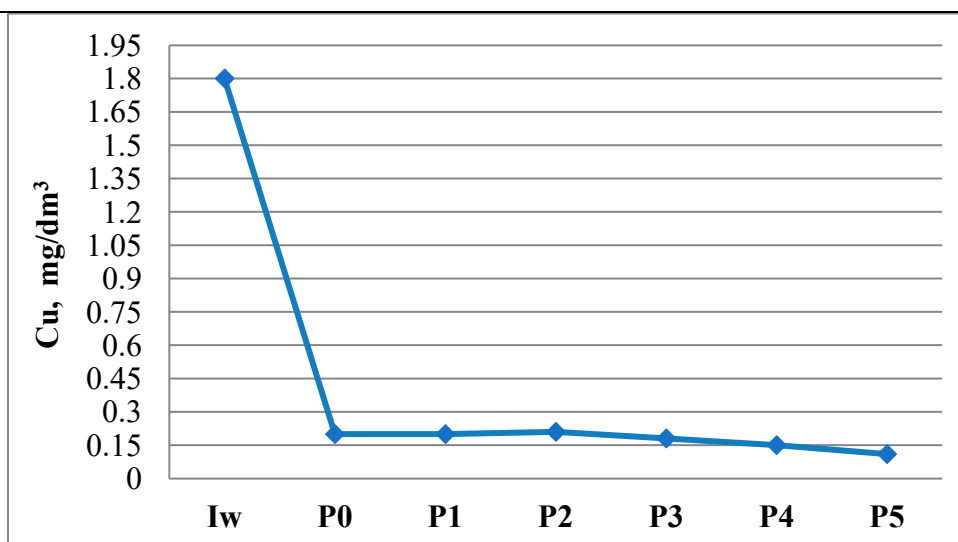


Figure S21. Graphical representation of the efficiency of Cu filtration from wastewater using filter papers with different mass additions of seaweed *Ulva rigida*

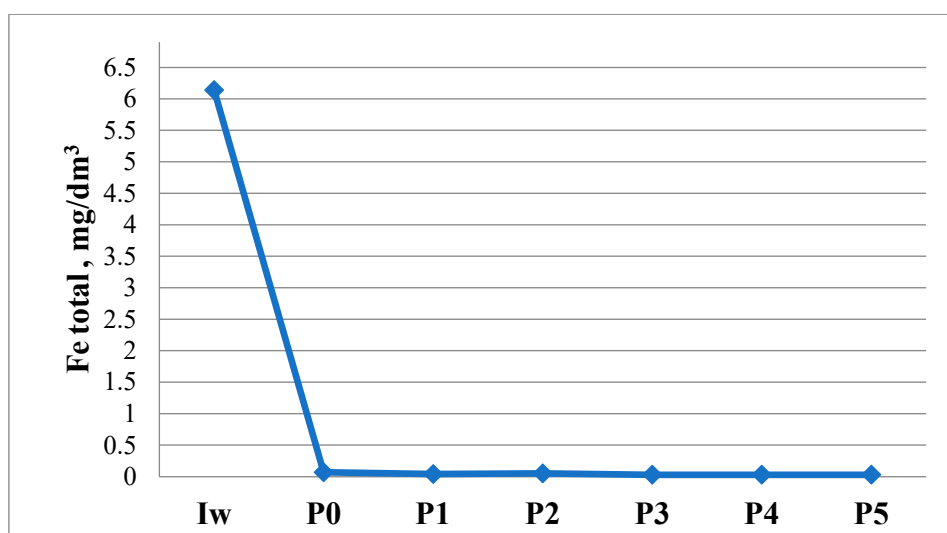


Figure S22. Diagram of the efficiency of filtering Fe total from wastewater from the metallurgical industry, testing filter papers with seaweed mass addition

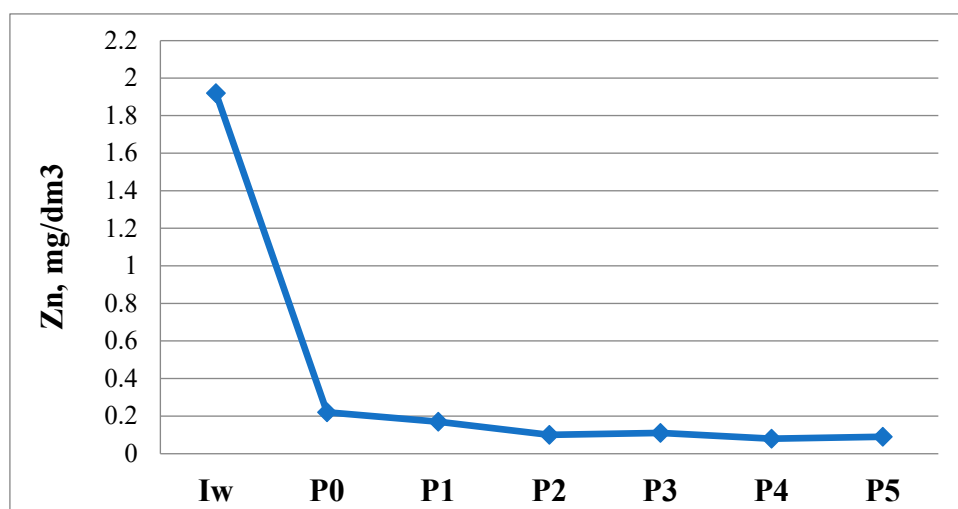


Figure S23. Diagram of the efficiency of filtering Zn from wastewater from the metallurgical industry, testing filter papers with seaweed mass addition

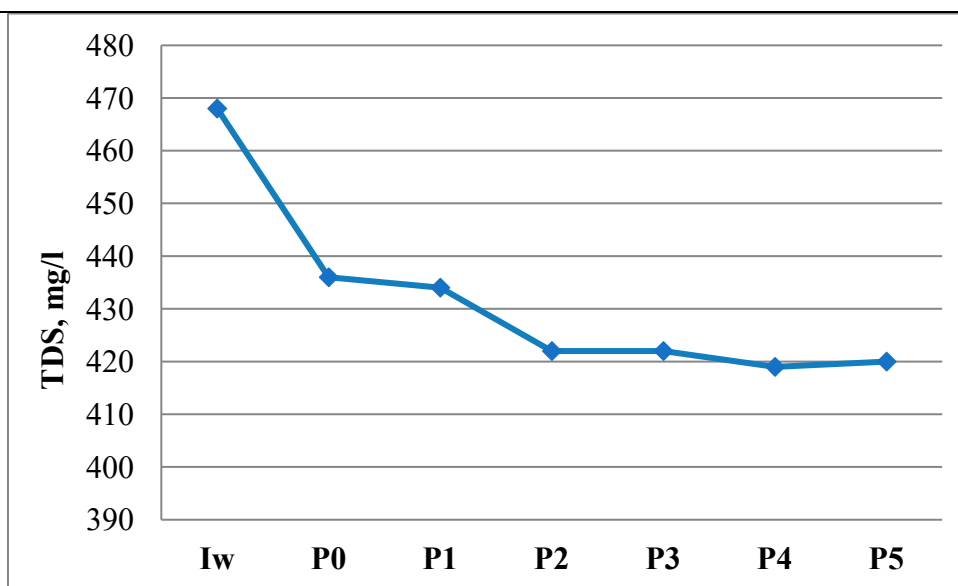


Figure S24. Graphical representation showing the results of TDS concentrations obtained after wastewater filtration using filter papers with different mass additions of *Ulva rigida* algae

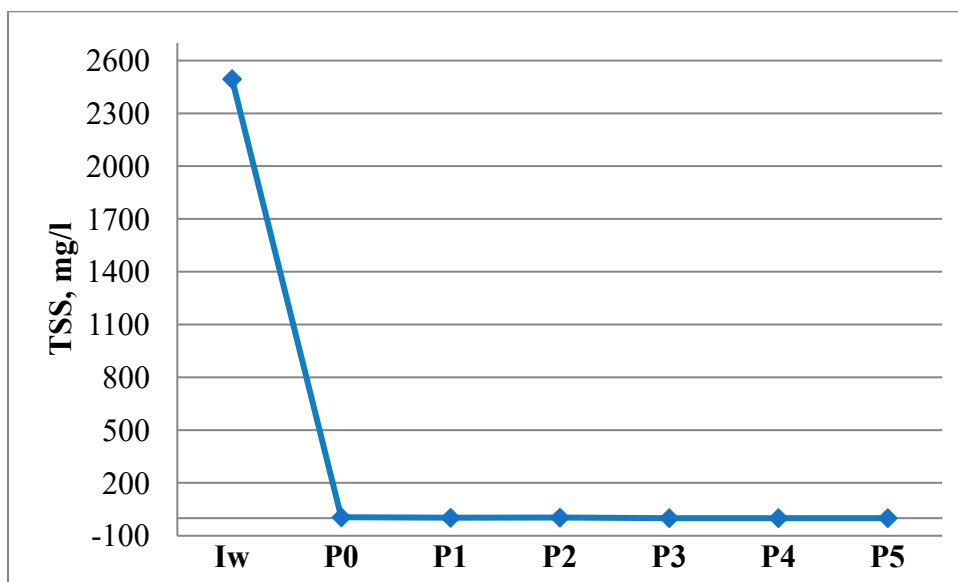


Figure S25. Graphical representation showing the results of TSS concentrations obtained after wastewater filtration using filter papers with different mass additions of *Ulva rigida* algae