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Valorization of Marine Seaweed Biomass: Furanic Platform Chemicals and Beyond

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Abstract : Exploding demand for various types of fuels and gradually growing impacts of atmospheric carbon dioxide have forced the researchers to search biofuels in general and algae-based biofuels in particular. However, strain identification in terms of fuel productivity and over all economics of fuel generation remains a debatable challenge. Utilization of marine biomass, especially the ones important in the Indian subcontinent, in forming furanic fuels and specialty chemicals would likely to be a better value-addition pathway. Seaweed species e.g. Ulva, Sarconema, and Gracilaria species have been found more productive than land-based biomass sources due to their higher growth rate. Additionally, non-recalcitrant nature of marine biomass unlike lignocellulosics has attracted much attention in recent years towards producing bioethanol. Here we report the production of renewable, biomass-derived platform molecules such as furfural and 5-(chloromethyl) furfural (CMF) from a seaweed species which are abundant marine biomass. These products have high potential for synthetic upgradation into various classes of value-added compounds such as fuels, fuel-additives, and monomers for polymers, solvents, agrochemicals, and pharmaceuticals.

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