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Behaviors of dissolved trace elements associated with humic dissolved organic matter of different origins in coastal seawater

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In the coastal area or marginal seas, trace element distributions are strongly regulated by both terrestrial input and complex biogeochemical cycling processes [1]. These would eventually control their fluxes to the open ocean, hence influencing the marine primary production. The behaviors of dissolved trace elements, rare earth elements (REEs), and humic dissolved organic matter (DOM_H) were investigated in the surface waters of two coastal regions in Korea. The influence of both terrestrial and marine-derived DOM_H on the cycling of trace elements in coastal seawater was discussed in this study. Despite the occurrence of intensive scavenging processes revealed by the REE behaviors and rapid removal of particle-reactive ^{234}Th as well as significant biological removal processes, our results showed that both terrestrial and marine origins of DOM_H would associate with dissolved trace elements, especially with Mn, Fe, and Cu, which would protect these elements from being removed by particle scavenging or biological uptake. This association process could result in a longer residence time for these trace elements in the water columns, hence travelling longer distances. Moreover, this study discovers that the stabilization of trace elements by different sources of DOM_H could be variable depending on the biogeochemical processes. Thus, the association of trace elements with DOM_H seems to play a key role in the shuttling of bio-essential trace elements to the open ocean via coastal oceans.

[1] Charette, M. A., Lam, P. J., Lohan, M. C., Kwon, E. Y., Hatje, V., Jeandel, C., Shiller, A. M., Cutter, G. A., Thomas, A., Boyd, P. W., Homoky, W. B., Milne, A., Thomas, H., Andersson, P. S., Porcelli, D., Tanaka, T., Geibert, W., Dehairs, F., & Garcia-Orellana, J. (2016). *Philosophical Transactions of the Royal Society a-Mathematical Physical and Engineering Sciences* 374, 2081