Letter to the Editor: Radon isotope assessment of Submarine Groundwater Discharge (SGD) in Coleroon River Estuary, Tamil Nadu, India

Noble Jacob¹

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Dear Dr. Revay,

I have read with much interest the article “Radon isotope assessment of Submarine Groundwater Discharge (SGD) in Coleroon River Estuary, Tamil Nadu, India” authored by Prakash et al. 2018 (<https://doi.org/10.1007/s10967-018-5877-2>) that describes the estimation of SGD in Coleroon River Estuary, Tamil Nadu, India from the continuous ^{222}Rn measurement of groundwater and pore water samples at three different locations for a period of 10 days.

In this context, I would like to state that, most of the SGD studies carried out worldwide using ^{222}Rn isotopes are based on the continuous monitoring of ^{222}Rn in coastal seawater and not by continuous monitoring of ^{222}Rn in groundwater [1–7]. Also, the SGD fluxes are generally calculated using ^{222}Rn mass balance in the coastal seawater.

However, the authors measured the temporal variation of ^{222}Rn in groundwater/pore water, and they calculate the SGD rates using the same ^{222}Rn mass balance equation [1, 5] derived for coastal seawater, which, according to me, is not correct.

The dynamics of coastal seawater and groundwater are completely different and are governed by various physical processes. Hence, the variation of ^{222}Rn in groundwater with respect to tidal cycles is not the same as that of coastal seawater. Therefore, the calculation of SGD rates from the variation of ^{222}Rn in groundwater is questionable.

Also, I am quite skeptical about the accuracy of ^{222}Rn measurement attaining a minimum detectable activity of

5 Bq/m³ for 20 min of counting when the sample is collected in 125 ml bottle. The reference for the measurement procedures of ^{222}Rn in groundwater is also not cited in the paper.

Yours faithfully,

Dr. Noble Jacob

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✉ Noble Jacob
noblej@barc.gov.in

¹ Isotope Hydrology Section, Isotope and Radiation Application Division, Bhabha Atomic Research Centre, Mumbai 400 085, India