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Monitoring of Local Monsoon in Thailand using Stable Isotope Technique

In May and June 2021, Cyclone Yaas and Tropical Storm Koguma caused high rainfall in various parts of Thailand. The precipitation samples during this period were collected on a daily from six rain gauge stations in the southwest, north, and northeast. All samples were analyzed with cavity ring-down spectroscopy, CRDS which is a highly sensitive spectroscopic technique. The stable isotope composition of precipitation illustrated a considerably depleted value, with the $\delta^{18}O$ values ranging from -8 to -3‰ and the $\delta^{2}H$ values ranging from -40 to -15‰. Yaas, which originated from the north of the Bay of Bengal, may have an impact on some areas of the southwest (Prachuap Khiri Khan, Ranong, and Phuket). Ranong province is remarkable among others of the depleted isotopic values (-5.54 to -3.98‰ $\delta^{18}O$ and -29.79 to -21.22‰ $\delta^{2}H$) and a large amount of precipitation (>35.1 mm). Identically, the heavy precipitation and the depleted isotope values of the north (-2.49‰ $\delta^{18}O$ and 11.94‰ $\delta^{2}H$ of Nan) and northeast (-3.36‰ $\delta^{18}O$; 18.21‰ $\delta^{2}H$ of Nong Khai, and -5.01‰ $\delta^{18}O$; -30.02‰ $\delta^{2}H$ of Ubon Ratchathani) were influenced by the Koguma from the Gulf of Tonkin. In recent times, the isotopic composition might be a significant parameter to adjust the simulation of a weather forecast for higher accuracy and precision.

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