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Investigating the sedimentary DNA of palaeotsunami deposits in Thailand.

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Investigating palaeotsunami deposits is a primary way to extend the tsunami database beyond relatively short instrumental and historical records. Such information is essential to reconstruct the frequency and magnitude of past coastal flooding events, which are a key to assess the impact and risk of tsunami to the coastal community. However, palaeotsunami studies are limited as most of the proxies, such as microfossil and geochemical signals, can be modified or degraded with time. Here, we present the application of DNA analysis to investigate a series of palaeotsunami deposits up to ~2800-years-old from a coastal beach ridge sequence on Phra Thong Island (Thailand). Our result shows that it is possible to accurately discriminate palaeotsunami deposits from intercalating organic mud layers using the microbial communities recovered from DNA preserved in the sediment of the geological record. Our work demonstrates that environmental DNA represents a new and promising tool for investigating historical and pre-historical tsunami records.