Structure of a new submarine volcano and magmatic phases to the East of Mayotte, in the Comoros Archipelago, Indian Ocean.

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50 km East of Mayotte Island (North Mozambique Channel; Comoros Archipelago), a submarine volcanic edifice formed during the first year of a seismo-volcanic crisis, between May 2018 and May 2019. Thanks to the French ANR Project COYOTES and the SISMAORE oceanographic cruise (2021), a multichannel seismic profile gives the first in-depth image of the new East-Mayotte volcano and its surrounding volcanic area. The seismic interpretation reveals that several distinct magmatic phases affected the area. The new volcano is built on a ~150 m thick sedimentary layer. Beneath this sedimentary layer, we found a major volcanic layer, ~2.5 km thick, which extends ~91 km to the south and ~33 km to the north of the newly formed submarine volcano. This volcanic unit is composed of multiple seismic facies that may indicate distinct successive volcanic phases. We interpret this major volcanic layer as part of the Mayotte volcanic edifice, with the presence of a complex magmatic feeder system underneath. We observe a ~2.2-2.5 km thick sedimentary cover between the main volcanic layer, below the new volcano, and the top of the crust. We tentatively identified the top-Oligocene seismic horizon (~23 Ma) well above the main volcanic layer, and assuming a constant sedimentation rate we estimate the onset of the volcanism at Mayotte Island at 28 Ma.

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