



HAL
open science

Discovery of recent volcanic and tectonic provinces along the Comoros archipelago (North Mozambique Channel) Preliminary results of the SISMAORE oceanographic cruise (ANR-COYOTES project)

Isabelle Thinon, Anne Lemoine, Sylvie Leroy, C. Berthod, J. Bernard, J. Bignon, P. Boymond, S. Bujan, A. Canva, N. Chamot-Rooke, et al.

► **To cite this version:**

Isabelle Thinon, Anne Lemoine, Sylvie Leroy, C. Berthod, J. Bernard, et al.. Discovery of recent volcanic and tectonic provinces along the Comoros archipelago (North Mozambique Channel) Preliminary results of the SISMAORE oceanographic cruise (ANR-COYOTES project). RST - 27^e édition de la Réunion des Sciences de la Terre, Nov 2021, Lyon, France. hal-03375817v2

HAL Id: hal-03375817

<https://hal-brgm.archives-ouvertes.fr/hal-03375817v2>

Submitted on 2 Dec 2021

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Discovery of recent volcanic and tectonic provinces along the Comoros archipelago (North Mozambique Channel) – Preliminary results of the SISMAORE oceanographic cruise (ANR-COYOTES project)

Isabelle Thinon^{*1}, Anne Lemoine¹, Sylvie Leroy², SISMAORE³ and COYOTES⁴ teams.

¹ BRGM- French Geological Survey - Orléans

² IStEP, Sorbonne Université, CNRS-INSU, Paris

³ BRGM, CNRS-INSU, ENS, EPOQ-université de Bordeaux, GET, Ifremer, IPGP, Université de la Réunion, ITES-EOST-Université de Strasbourg, LOG-Université de Lille, Sorbonne Université, BGR, Geo-Azur, Université des Comores;

⁴ <https://anr.fr/Projet-ANR-19-CE31-0018> ; <http://www.geocean.net/coyotes/doku.php?id=start>

A new geophysical and geological dataset, acquired during the SISMAORE oceanographic campaign (2020-2021), reveals a recent tectonic and volcanic deformation distributed over 130km in the abyssal plain that permit to unravel the unconstrained lithospheric plate boundaries between Lwandle and Somalia blocks and the controversial origin of the Comoros Archipelago.

Two recent submarine volcanic and tectonic provinces of 5000km², with a large number of varied volcanic structures and faults, are unveiled: the N160° N'Droudé (north of Grande-Comore) and the N130° Mwezi provinces (north of Anjouan/Mayotte). Dredged Mwezi rocks suggest a recent gas-rich volcanic activity. It is also identified a recent N130° trending volcanic structures (cones, lava flows, eruptive fissures) between Anjouan and Mayotte in agreement with the presence of shallow earthquakes, and also recent lava flows on the southern flanks of the Grande Comore and Moheli. Southwards, recent sedimentation is important with no volcanism and deformation. A consistent sedimentary thickness covers the flanks of Mayotte and Anjouan and the presence of large areas of submarine instability at the foot and on the slope of the islands is confirmed.

These first observations suggest a transtensional deformation, accommodated by dextral strike-slip motion, strongly influenced by pre-existing structuration of the Mesozoic oceanic crust and by the East Africa Rift system. The 130km wide zone of intraplate deformation characterizes an immature lithospheric plate boundary of the north Lwandle block.

SISMAORE onboard team: S. Ali, C. Berthod, J. Bernard, J. Bignon, P. Boymond, S. Bujan, A. Canva, N. Chamot-rooke, V. Clouard, E. Dassie, M. Delescluse, C. Doubre, V. Famin, N. Feuillet, D. Franke, E. Jacques, S. Jorry, C. Masquelet, N. Mercury, F. Paquet, V. Roche, F. Rolandone, A. Rusquet, C. Scalabrin, S. Abdoulahmid, J. Van der Woerd, L. Watremez, S. Zaragosi; On land: L. Sadeski, L. Michon, P. Bachèlery, C. Deplus, D. Sauter

Keywords: Recent tectonic and volcanic deformation, inheritance, Comoros archipelago, Mozambique Channel, Mayotte, SISMAORE, ANR COYOTES.