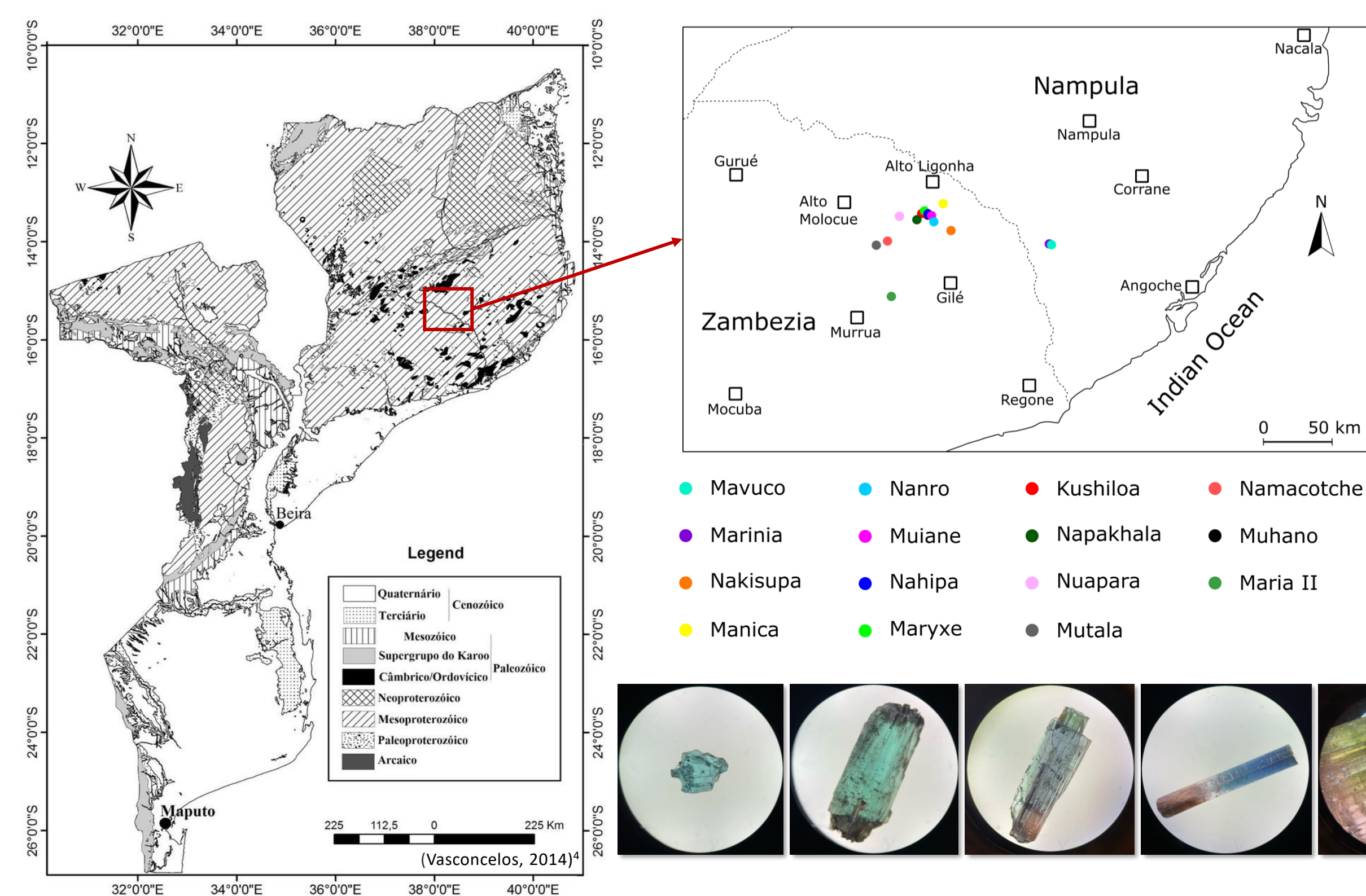


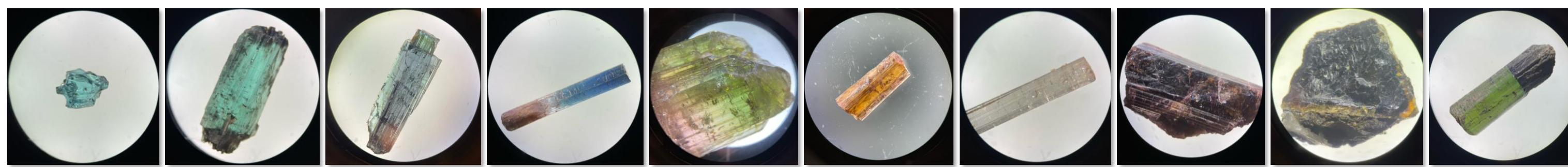
## INTRODUCTION

- › Tourmalines were found in Mozambique at the dawn of the **21<sup>st</sup> century**.
- › Main occurrences in **granitic pegmatites** and secondary deposits (**paleoplacers**).
- › In 2004, Cu-bearing elbaïtes with **Paraíba-type** colors were discovered in the **Mavuco secondary deposit**, Alto Ligonha pegmatitic district.
- › Supergroup of complex **trigonal borosilicates** with a **R3m** space group.
- › General formula :  $XY_3Z_6[T_6O_{18}](BO_3)_3V_3W$ .

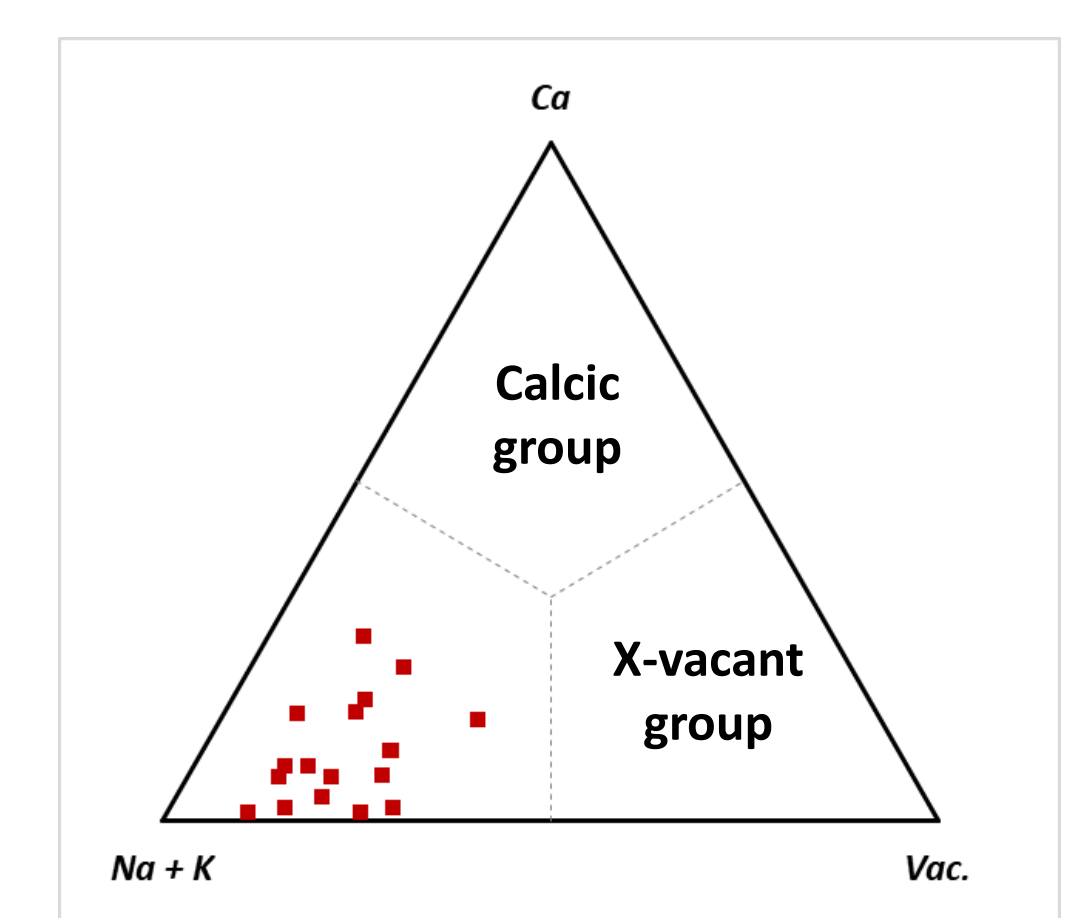
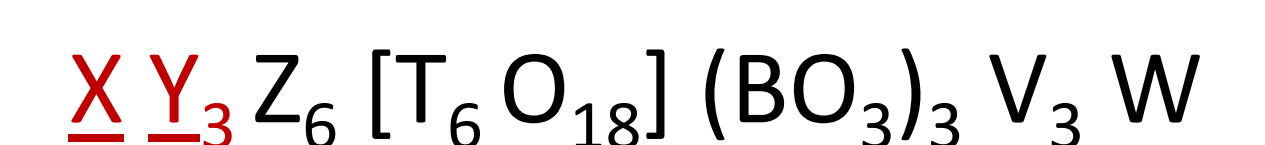
## OCCURRENCES OF TOURMALINES IN ALTO LIGONHA AREA, MOZAMBIQUE



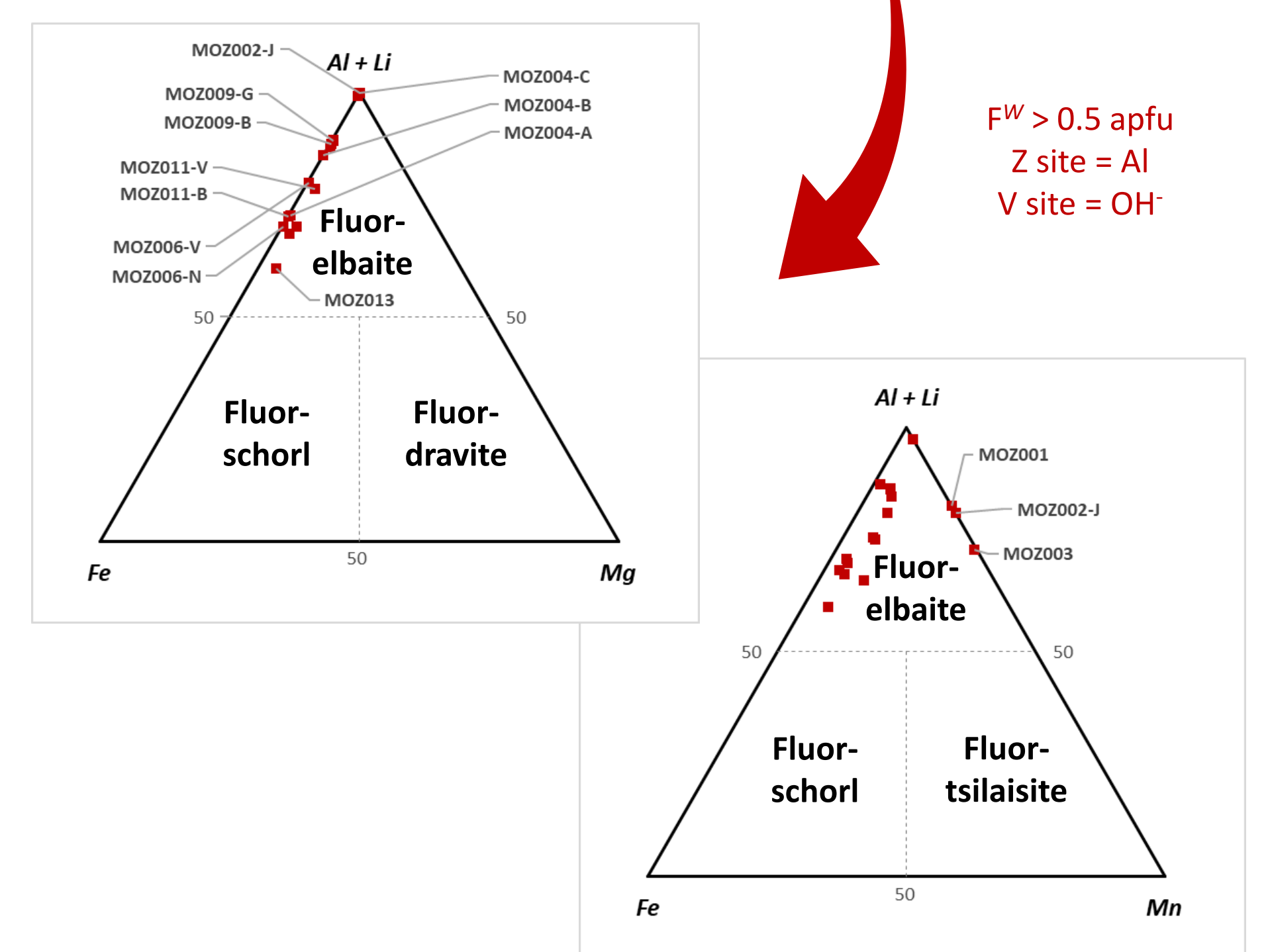
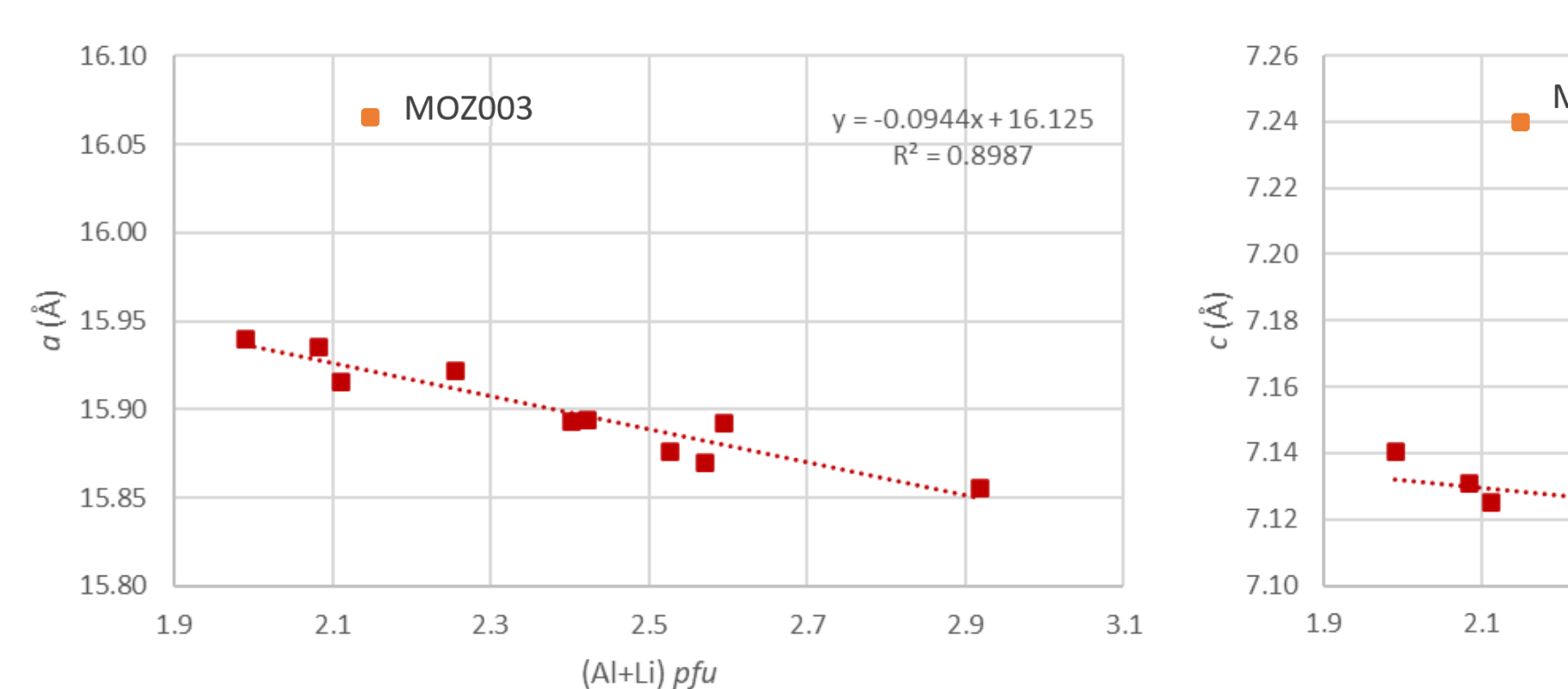
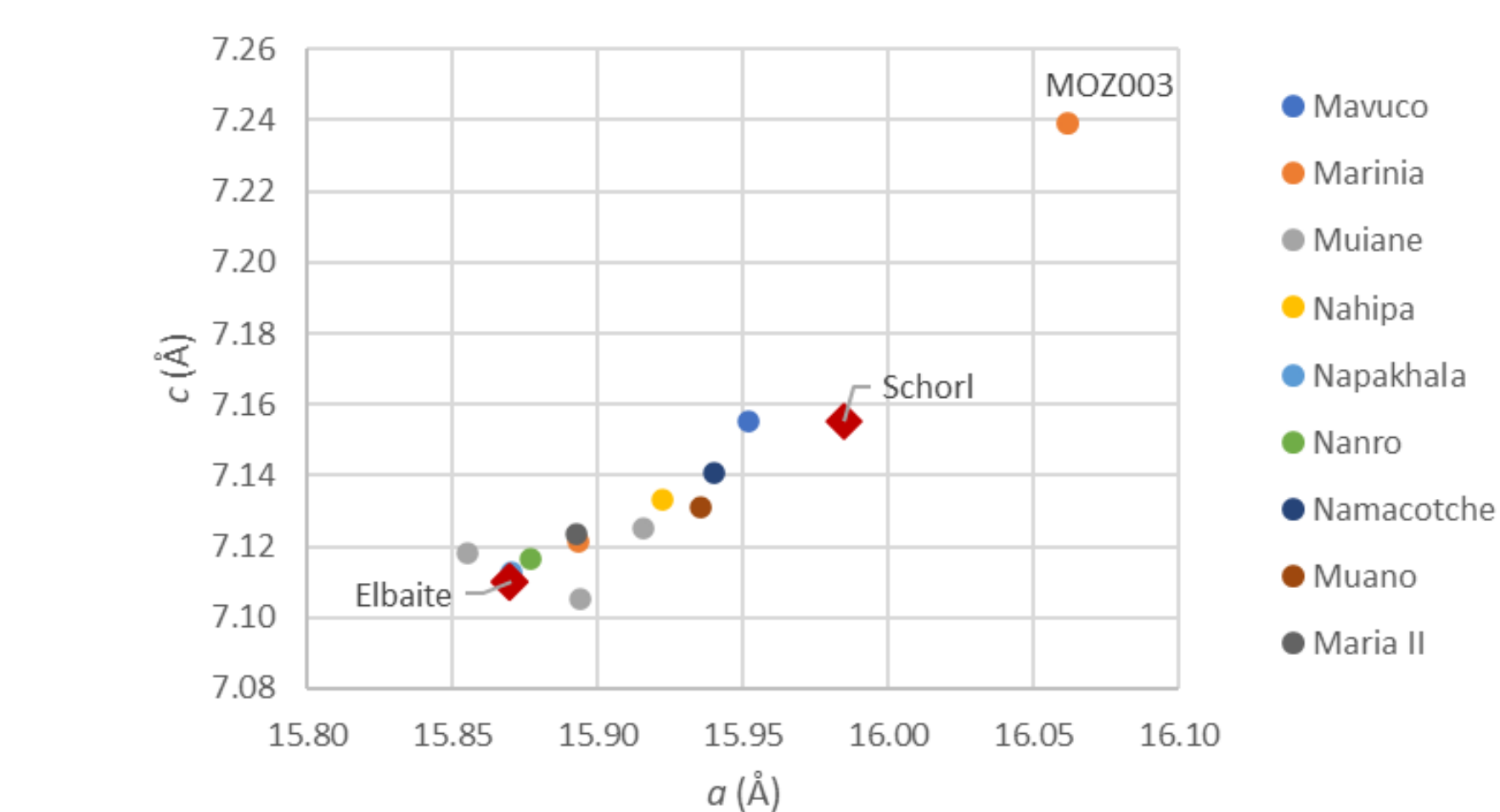
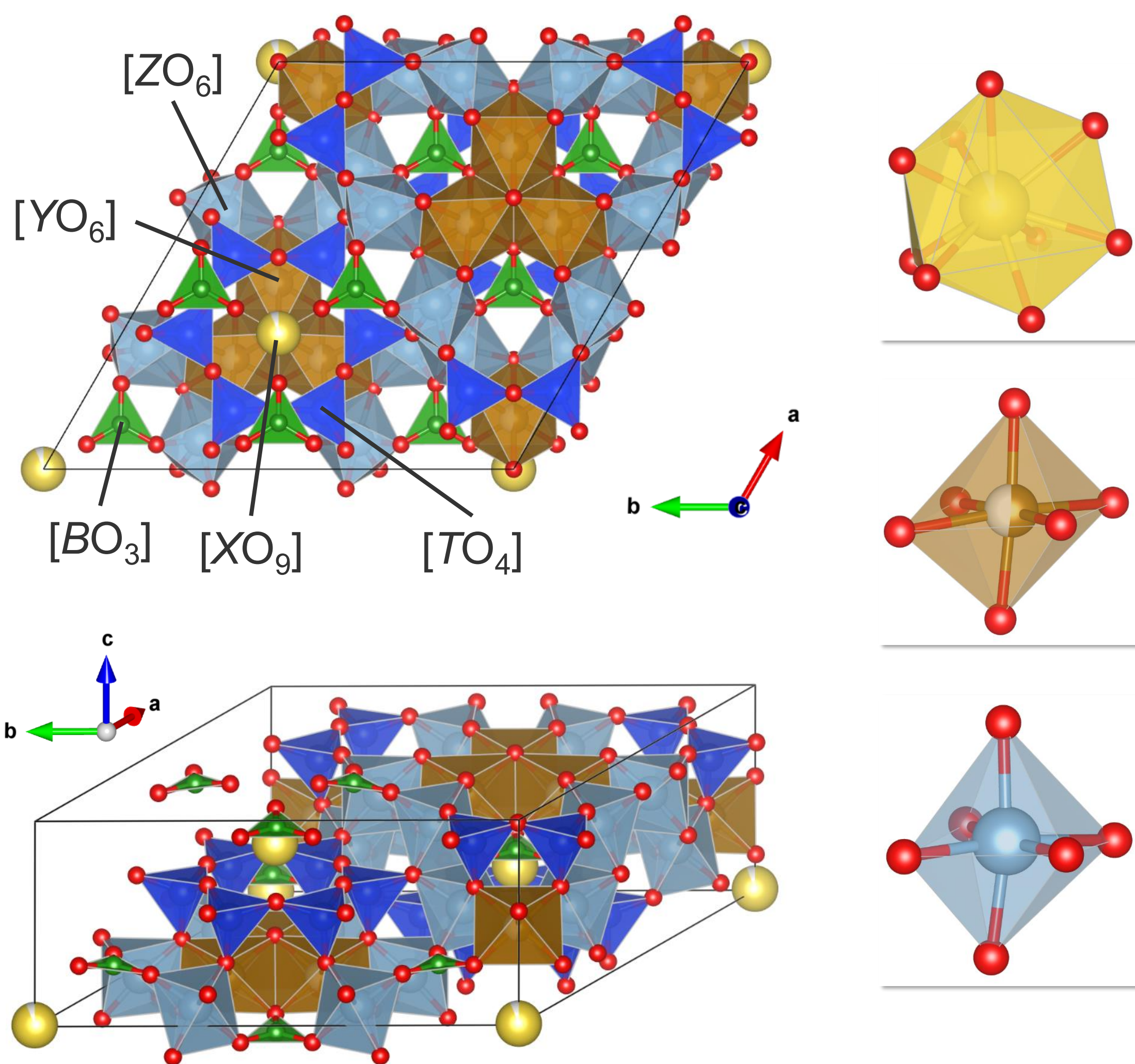
- › Pan-African orogen (0.56 - 0.80 Ga) → **Mozambican Belt**
- › Proterozoic gneiss–migmatite complex
- › Granitoids and **pegmatitic intrusions** (0.41 to 0.60 Ga)
- › Li, Nb, Ta, Be, industrial minerals and gemstones (**Tourmalines**, beryls, topaz, spodumenes, ...)
- › 68 tourmalines from 15 deposits



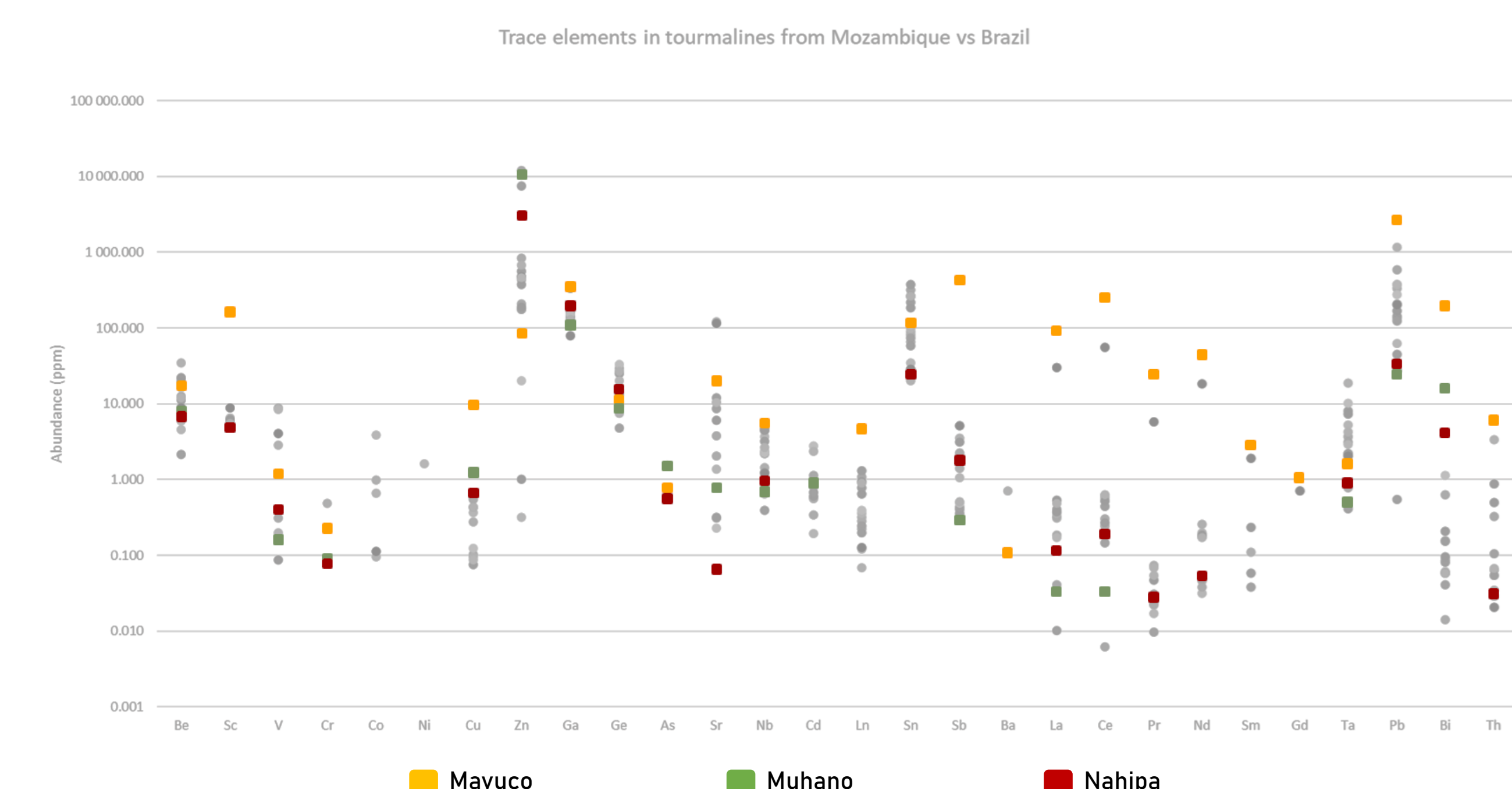
## MAJOR ELEMENTS COMPOSITIONS



## STRUCTURAL INVESTIGATIONS



## TRACE ELEMENTS PREVIEW



## CONCLUSIONS

- › **Main substitutions** take place on the Y crystallographic site between the major elements (Al+Li) (Fluor-elbaite), Fe<sup>2+</sup> (Fluor-schorl) and Mn<sup>2+</sup> (Fluor-tsilaisite).
- › Optical and compositional **zonations** reflect the **evolving set-up conditions** of granitic pegmatites.
- › **Atypical compositions** (Mn-enriched) have been identified in samples from the Mavuco placer and from the Marinia pegmatite.
- › High unit-cell parameters observed in the MOZ003 sample might be linked to the **presence of Mn<sup>3+</sup>** in the structure.
- › An inverse **correlation** between the size of the unit-cell and the amount of (Al+Li)<sup>Y</sup> could be used to semi-quantitatively **estimate the Li<sup>+</sup> contents** of Mozambican tourmalines with quick and cheap analyses.

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<sup>2</sup>Department of Mineralogy, Natural History Museum of Luxembourg

<sup>3</sup>Materials Research and Technology Department, Luxembourg Institute of Science and Technology

<sup>4</sup>Vasconcelos, L., 2014. Breve apresentação sobre os recursos geológicos de Moçambique. *Comunicações Geológicas*, 101, Especial II, 869-874.