Oligocene magmato-tectonic events influential in the development of Pb-Zn, Ag and Au mineralization at the Plomosas deposit, southwestern Sierra Madre Occidental, Mexico

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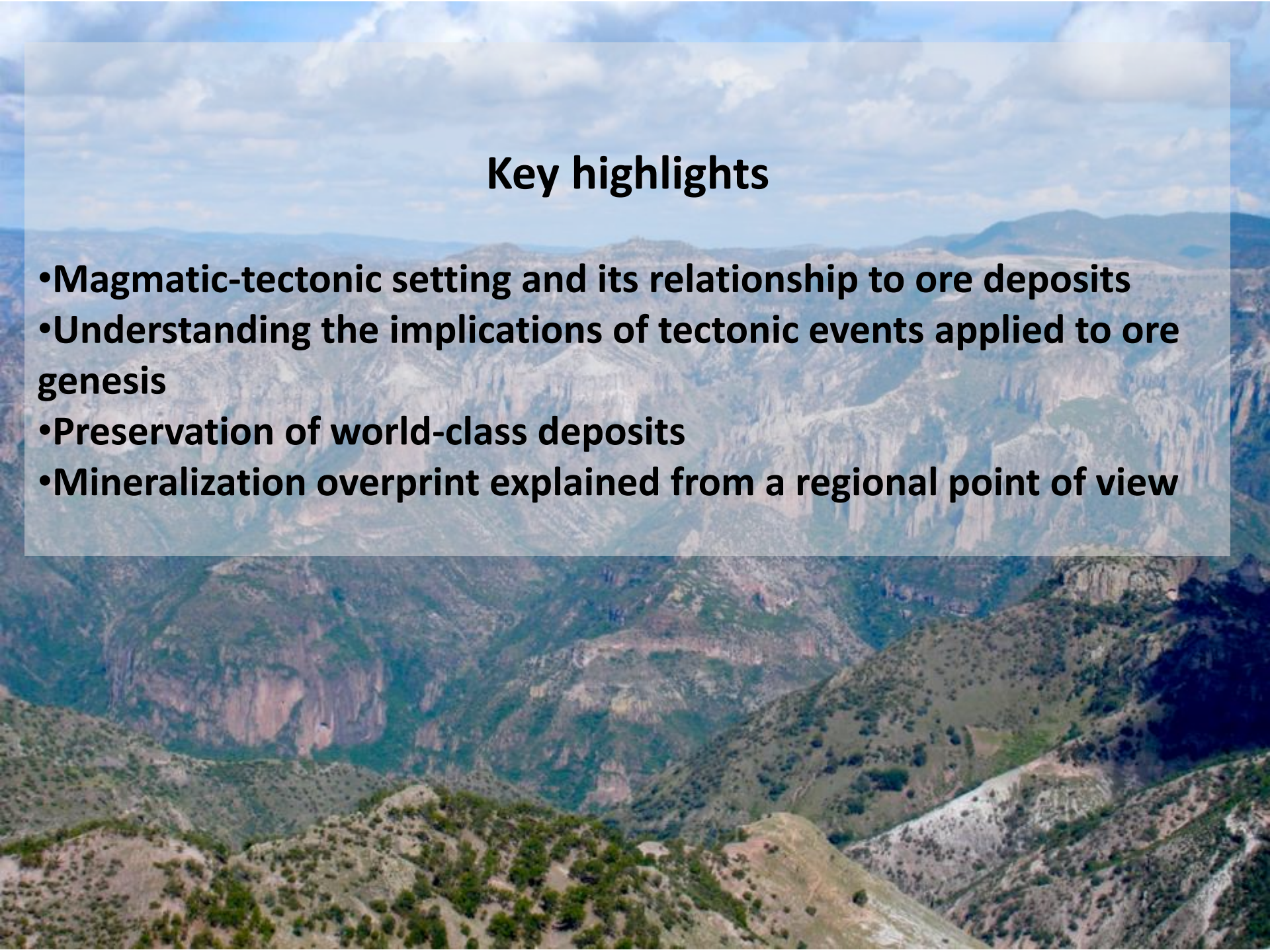
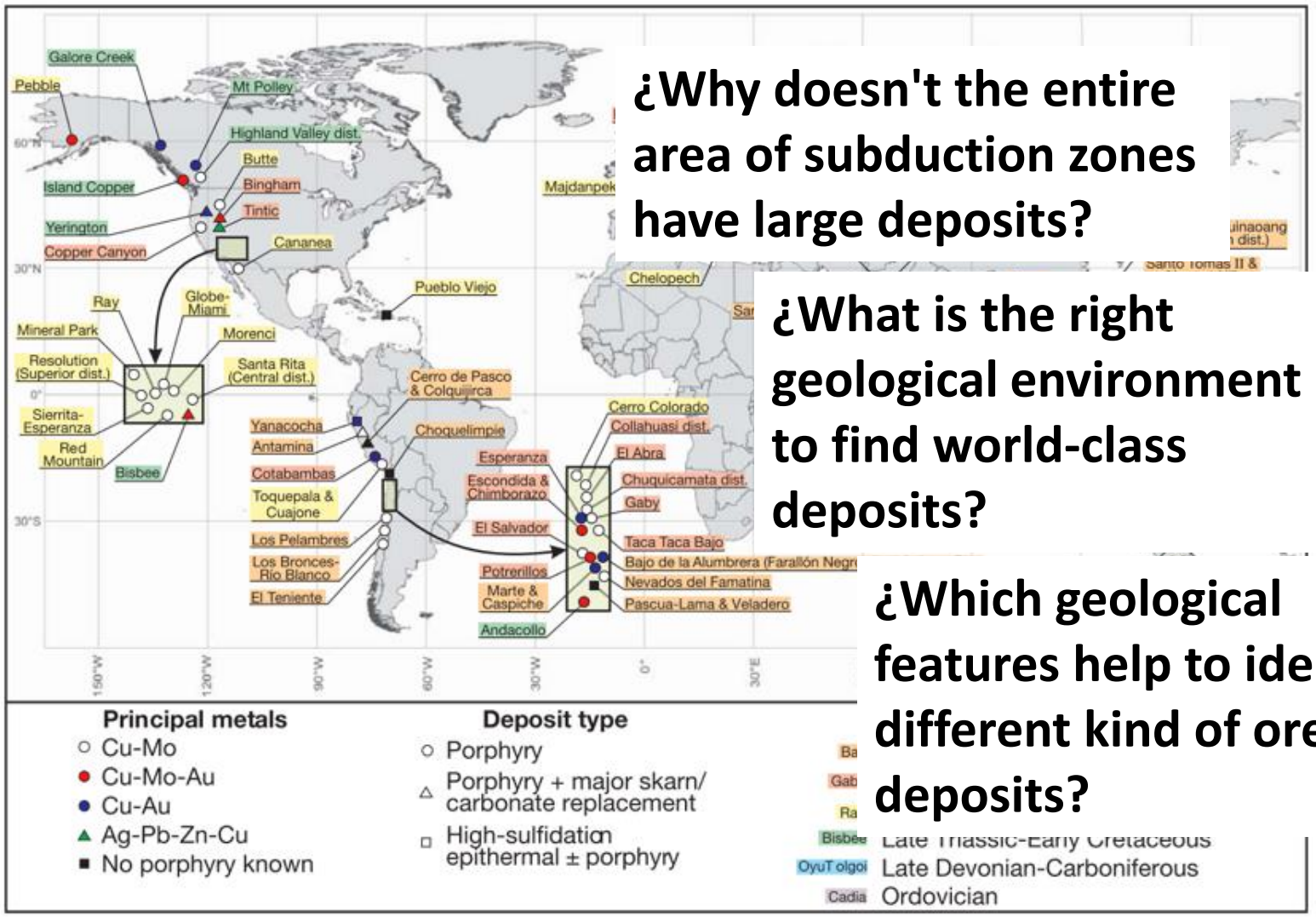


Key highlights

- Magmatic-tectonic setting and its relationship to ore deposits
- Understanding the implications of tectonic events applied to ore genesis
- Preservation of world-class deposits
- Mineralization overprint explained from a regional point of view

Magmatic-tectonic setting and its relationship to ore deposits



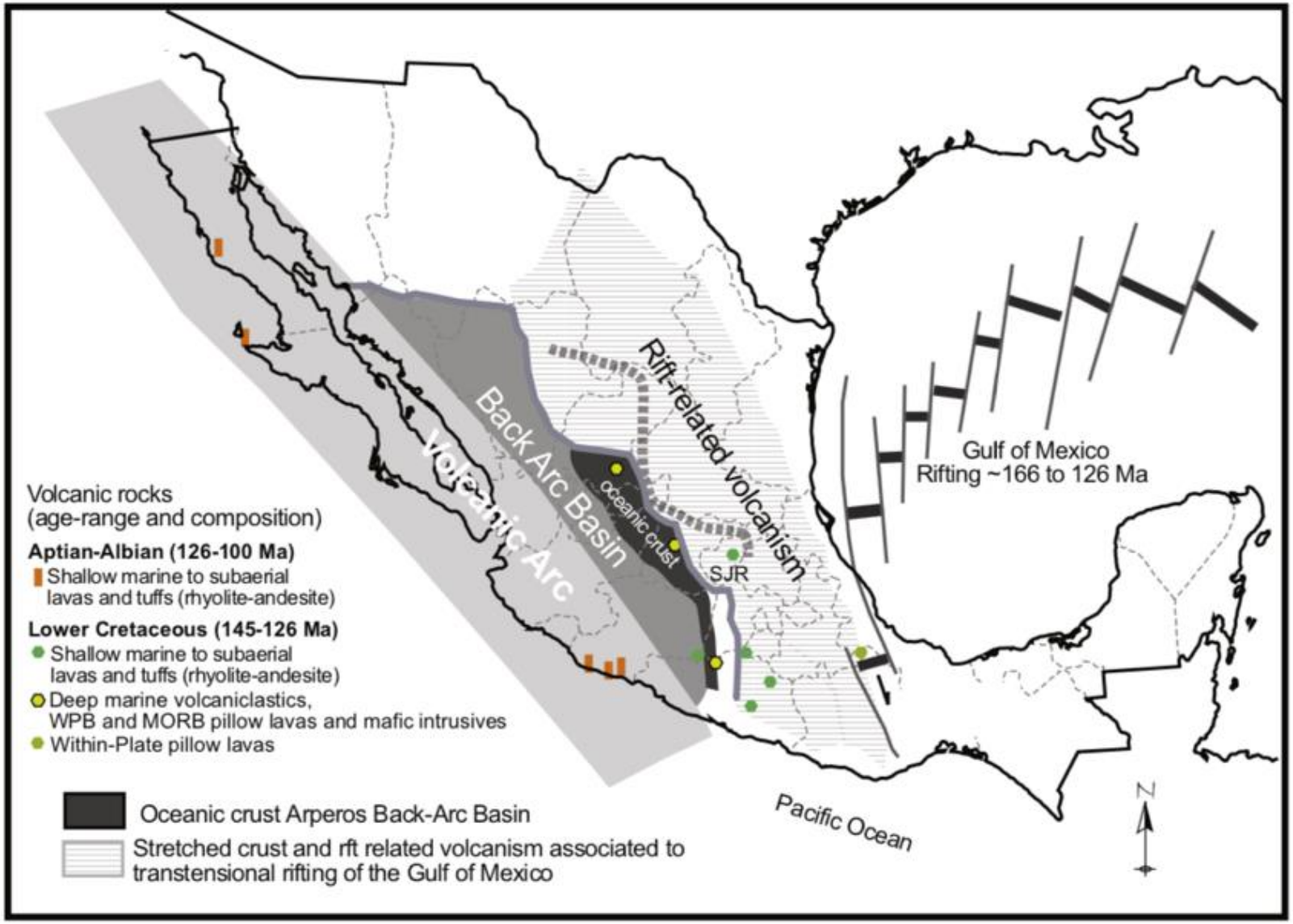
¿Why doesn't the entire area of subduction zones have large deposits?

¿What is the right geological environment to find world-class deposits?

¿Which geological features help to identify different kind of ore deposits?

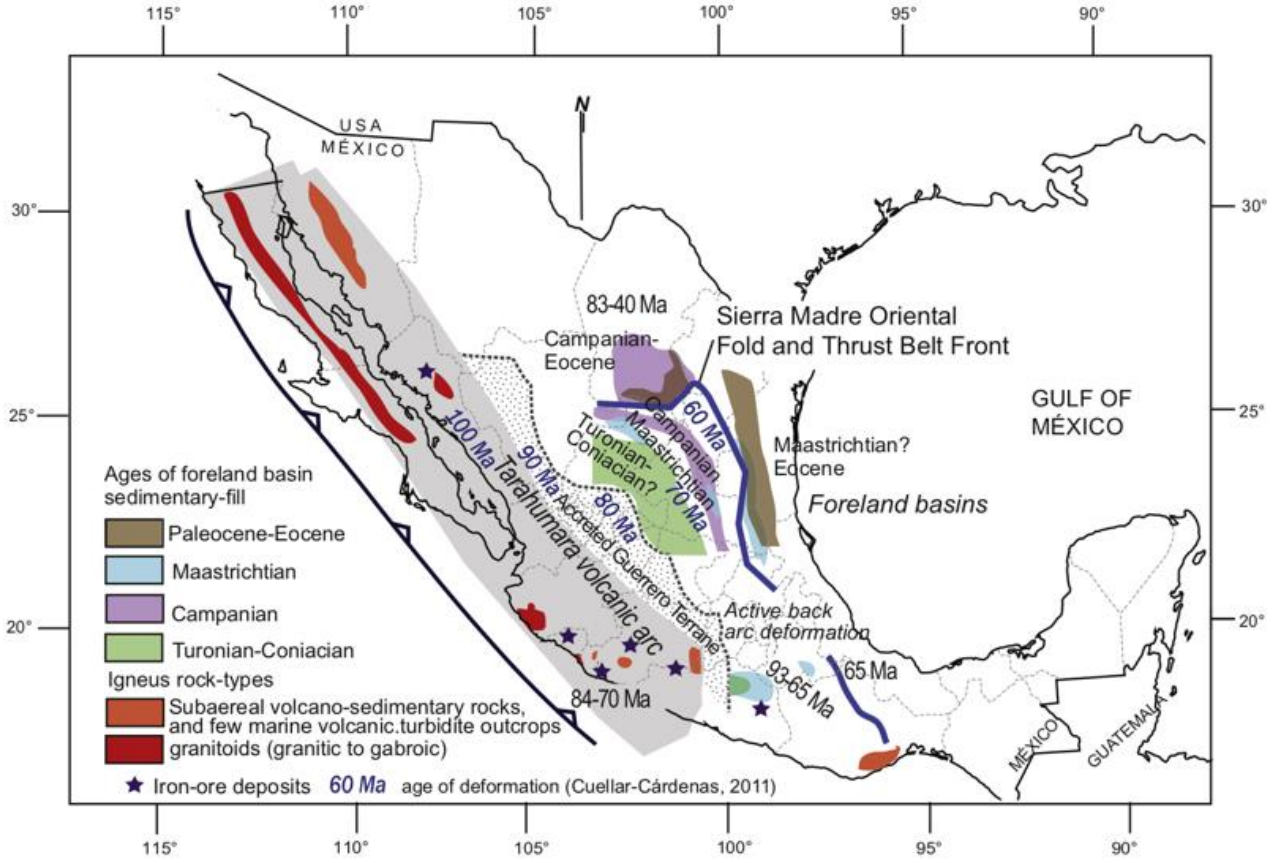
Sillitoe, 2010

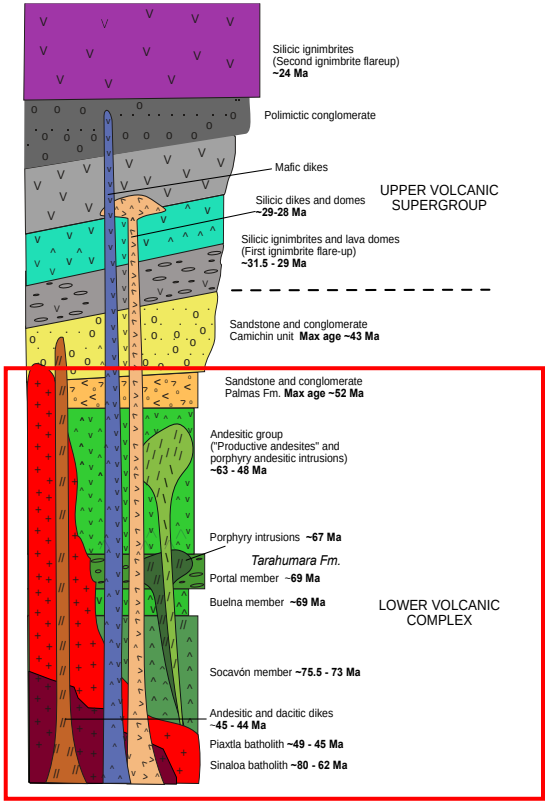
Terrain Guerrero Suture



Centeno, 2017

Strain and Laramide magmatism at North of México

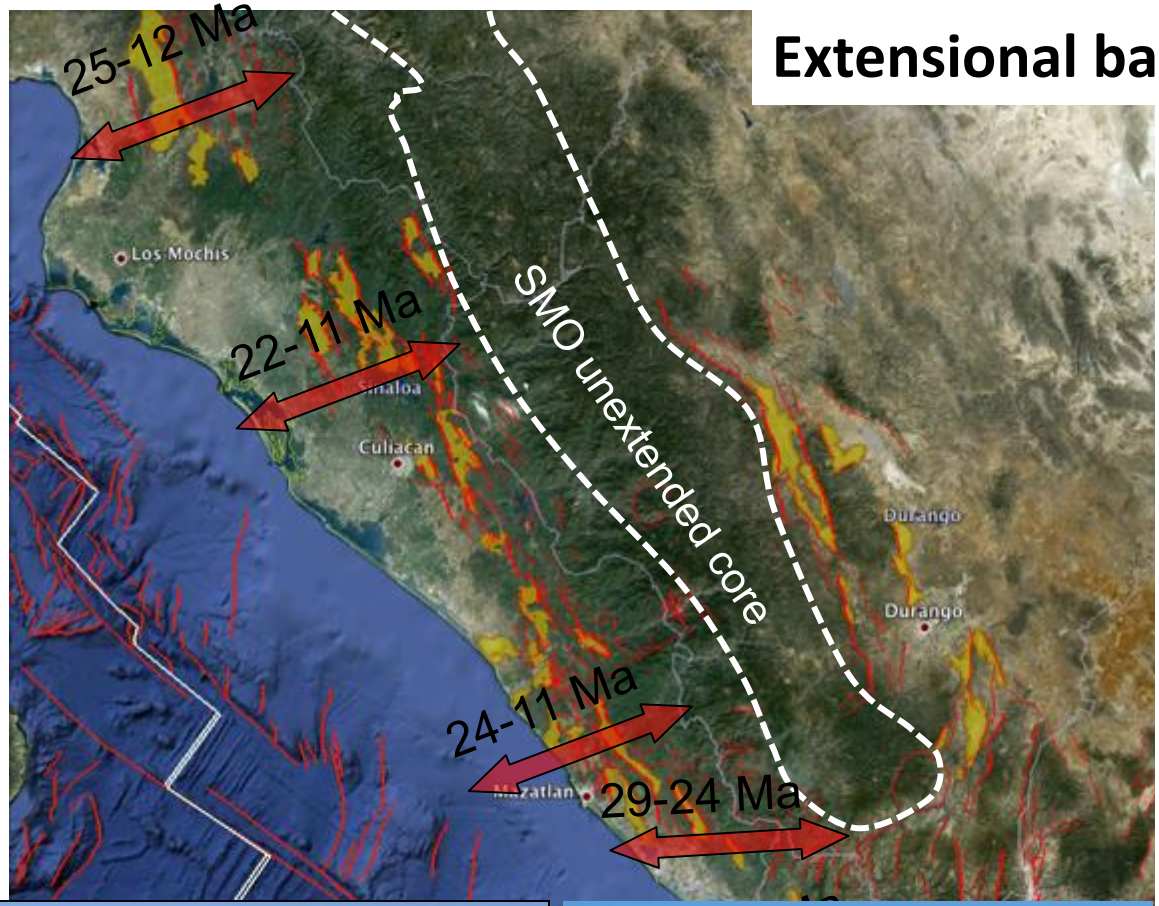




Cuellar-Cardenas, 2012; Centeno, 2017; Montoya-Lopera et al., 2019, 2020a,b; Montoya-Lopera et al., 2024

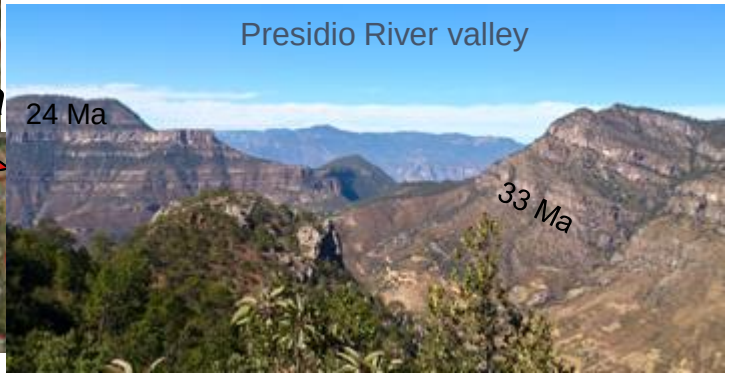
Extensión del Oligoceno

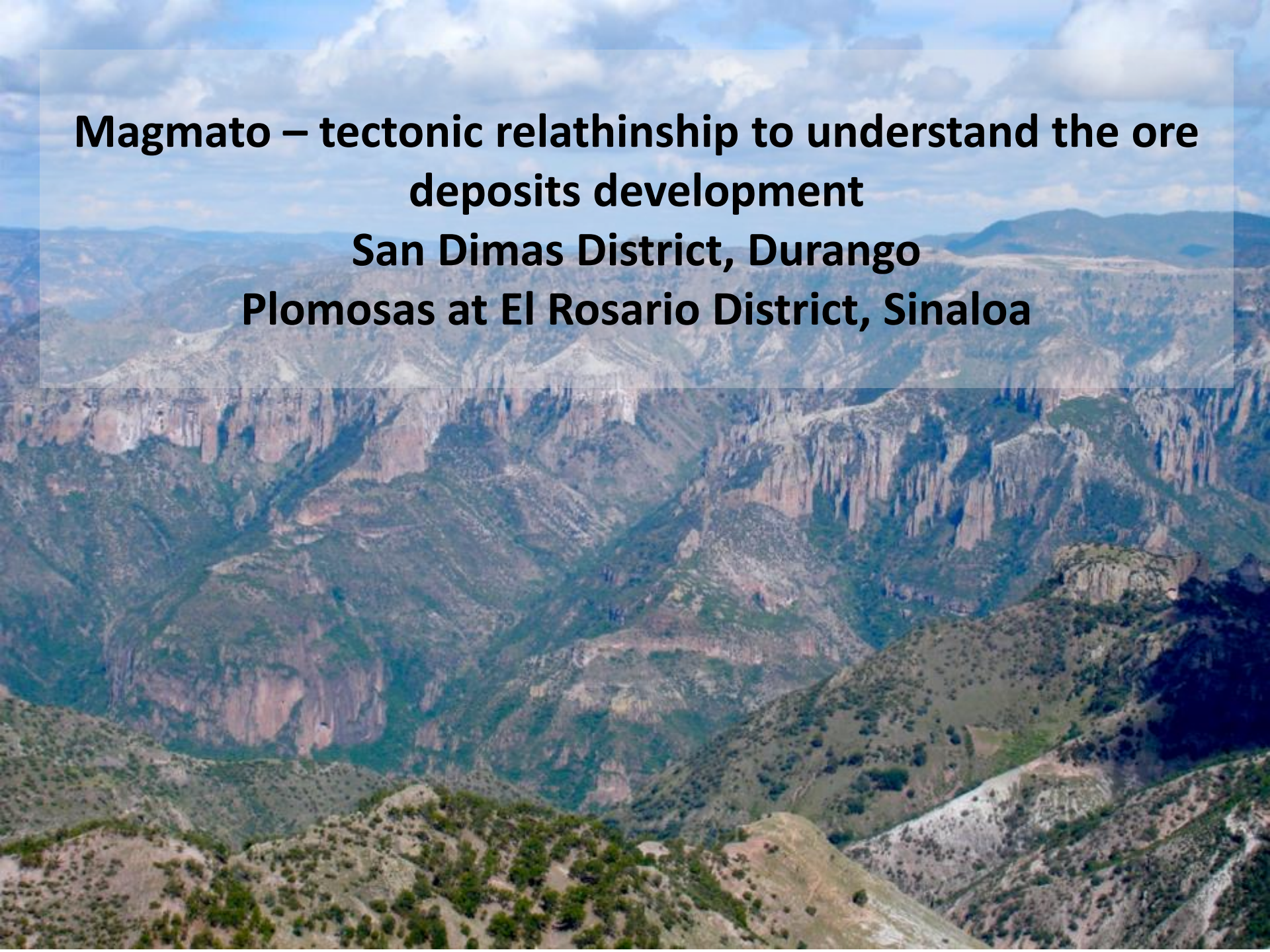
Extensional basins 29-12 Ma



Sinaloa and Nayarit extension begins in the late Oligocene, causing an angular unconformity between the Oligocene (32-29 Ma) and early Miocene (24-20 Ma) ignimbritic sequences.

Ferrari et al., 2002, Tectonics
Ferrari et al., 2013, Geosphere
Duque et al., 2015, GSA Bull.
Duque et al., 2014, RMCG



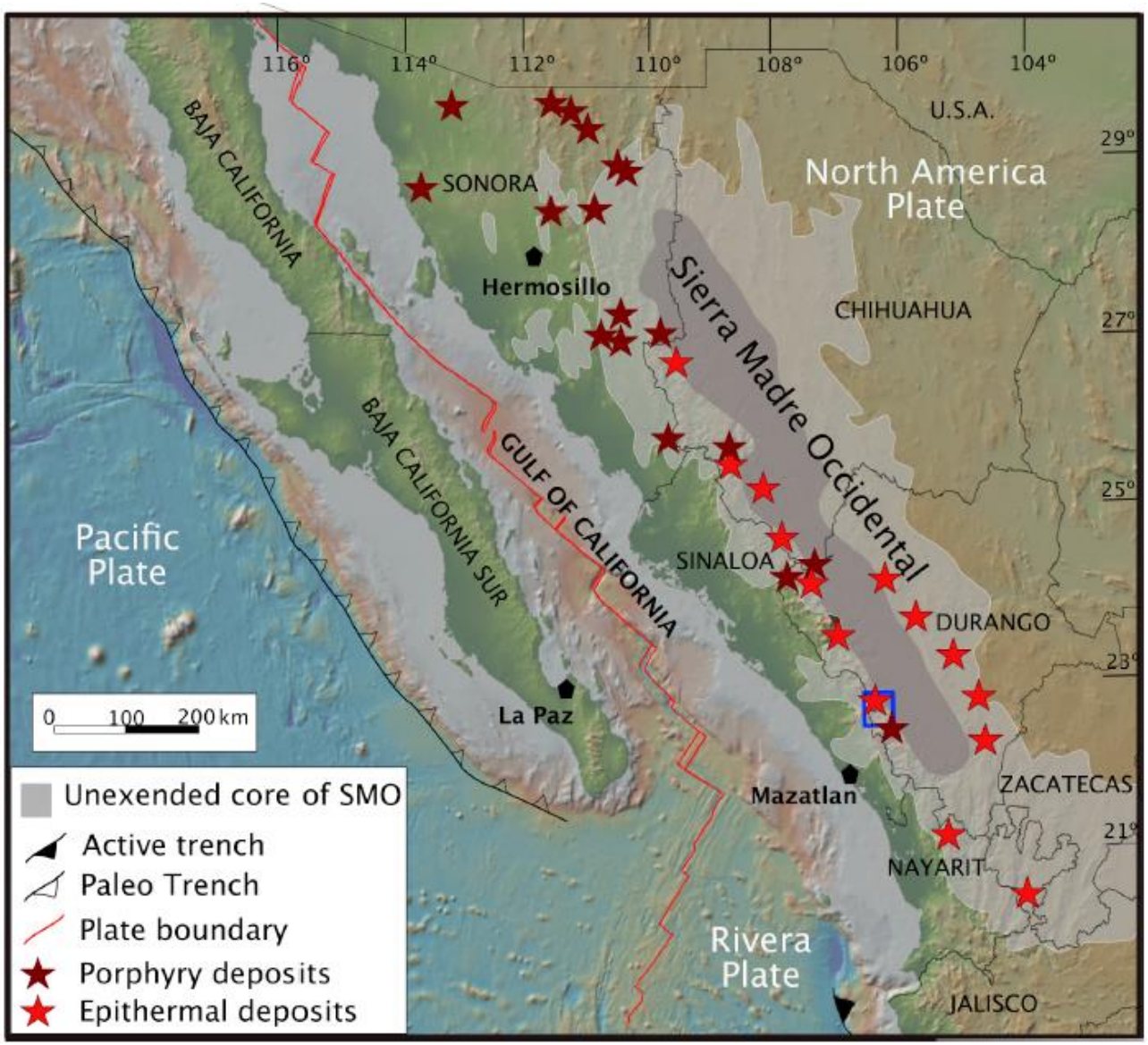


Magmato – tectonic relathinship to understand the ore deposits development

San Dimas District, Durango

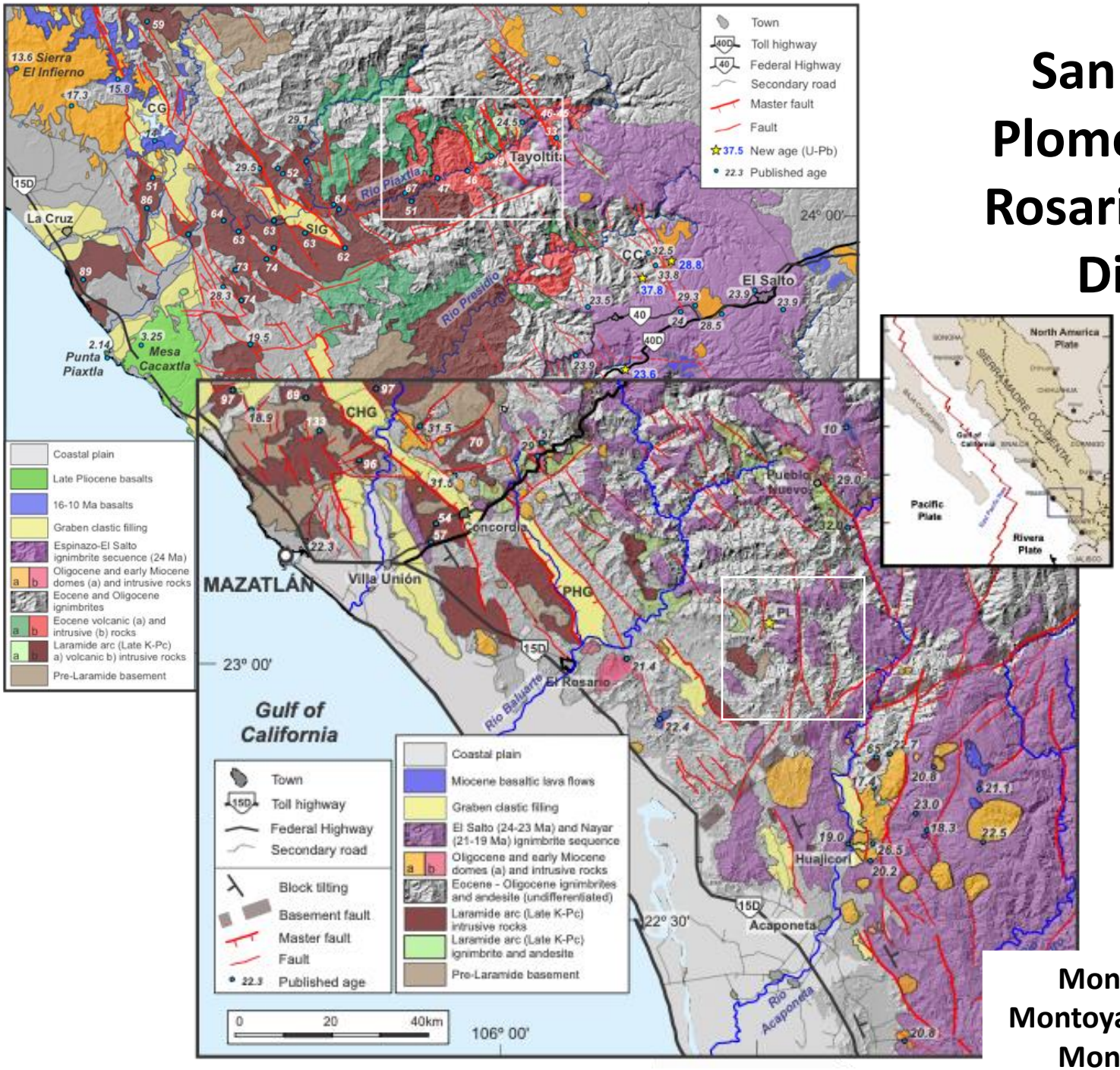
Plomosas at El Rosario District, Sinaloa

Magmatism and ore deposit development



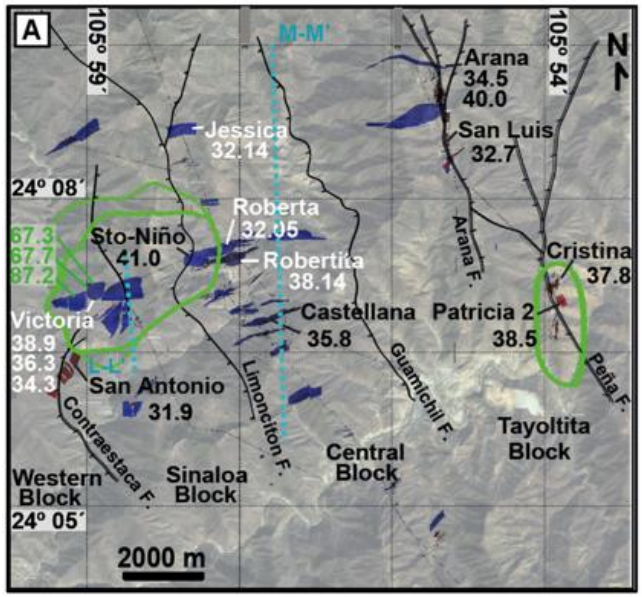
Montoya-Lopera et al., 2019

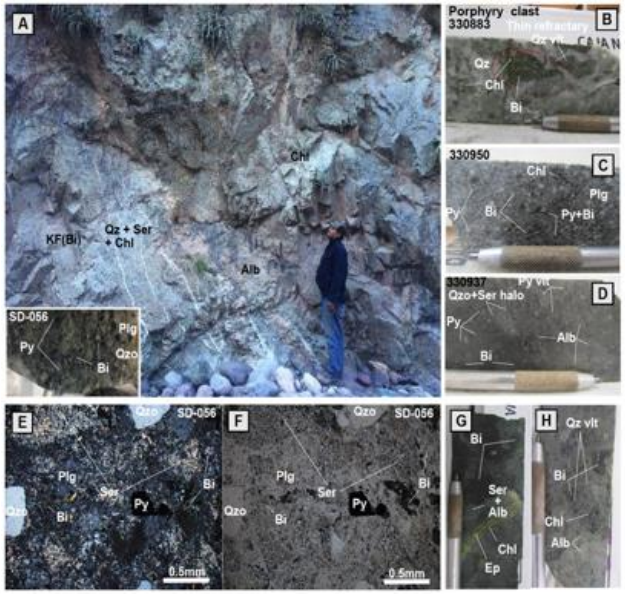
San Dimas, Plomosas at El Rosario Mining District



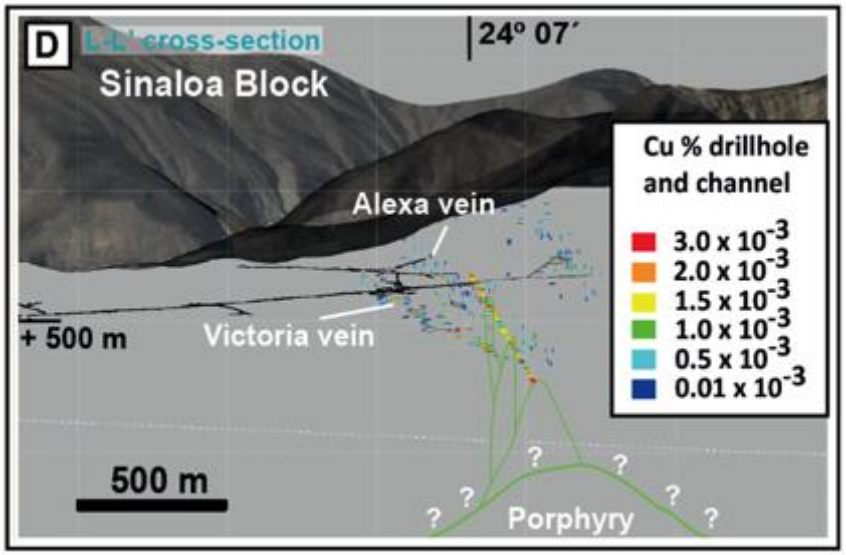
Montoya-Lopera et al., 2019
Montoya-Lopera et al., 2020 a,b
Montoya-Lopera et al., 2024

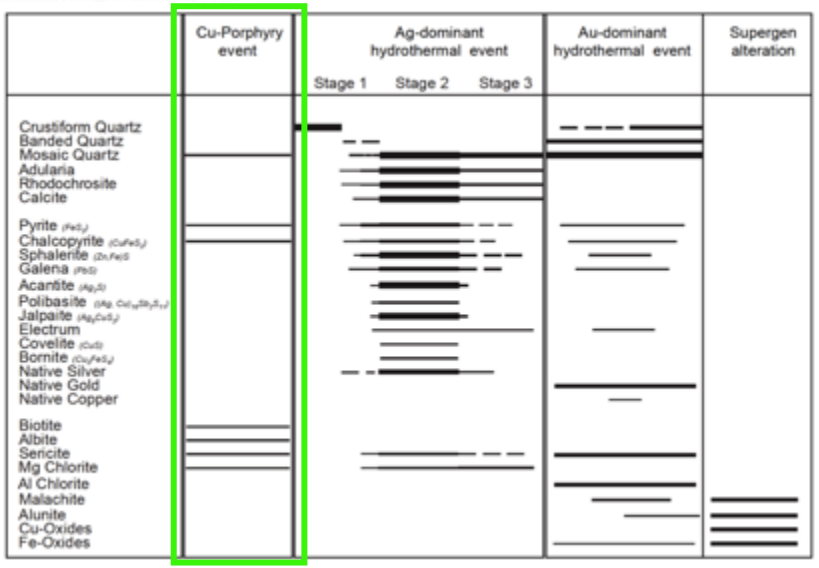
Cretaceous Cu-Mo Porphry mineralization



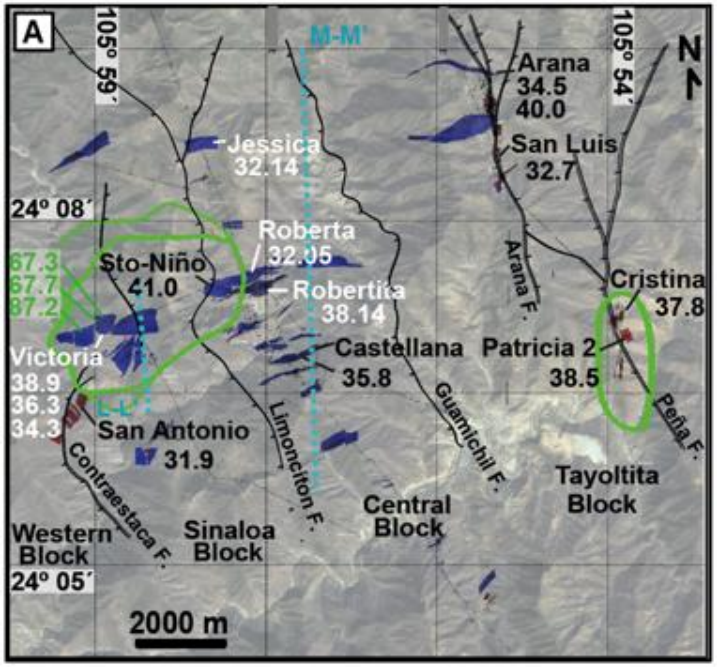


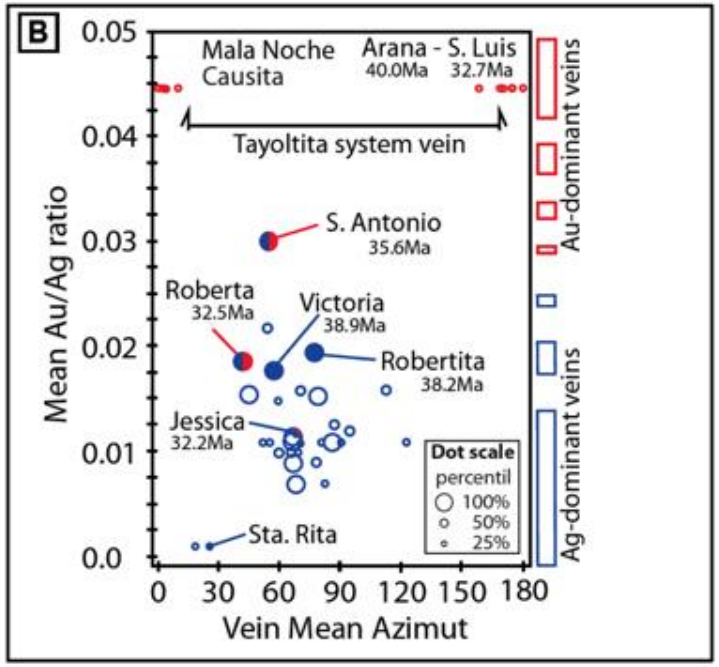
Montoya-Lopera et al., 2020 a
Montoya-Lopera et al., 2020 b

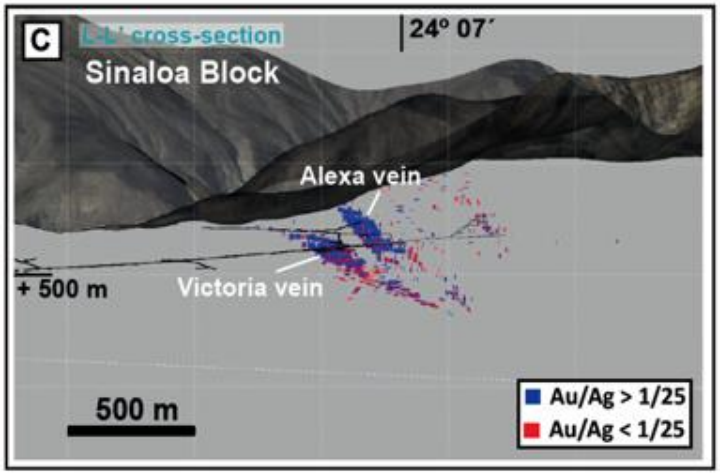


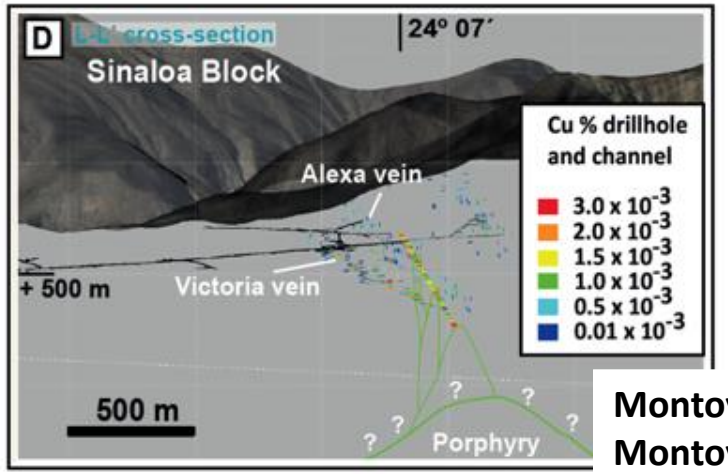


Eocene Ag rich mesothermal veins



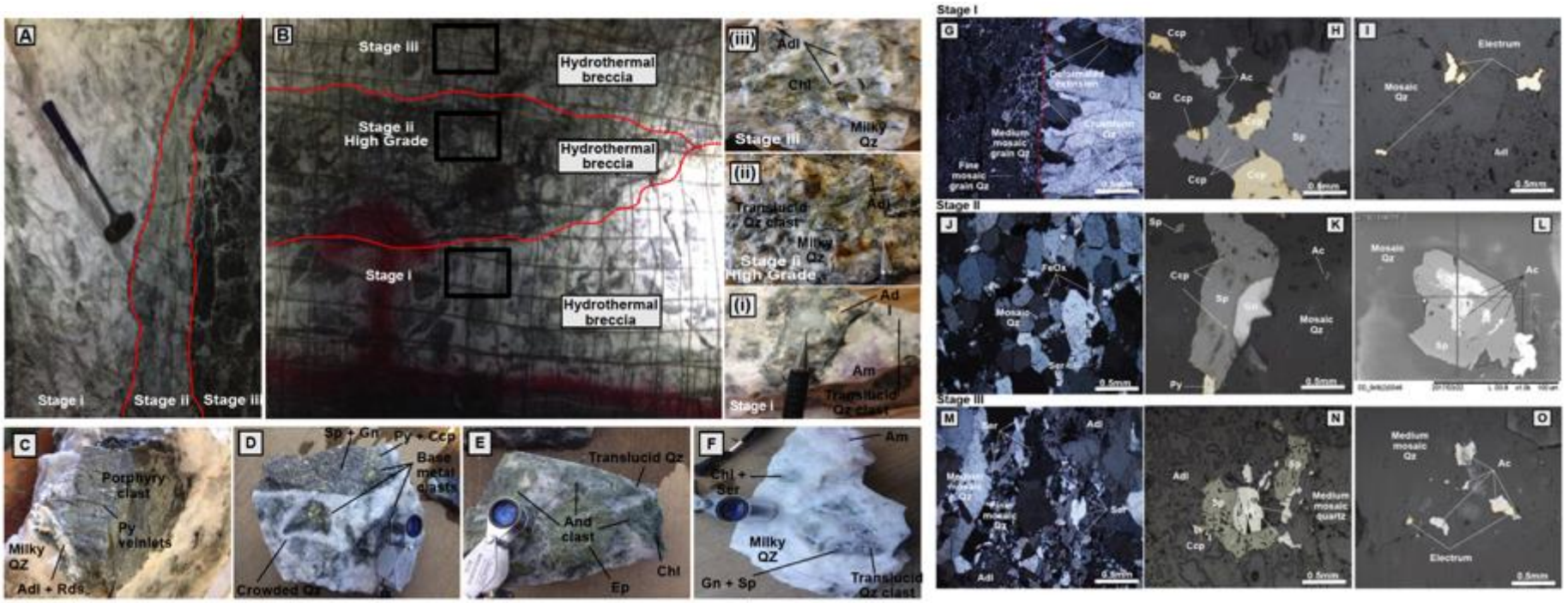






Montoya-Lopera et al., 2020 a
Montoya-Lopera et al., 2020 b

Eocene Ag rich mesothermal veins



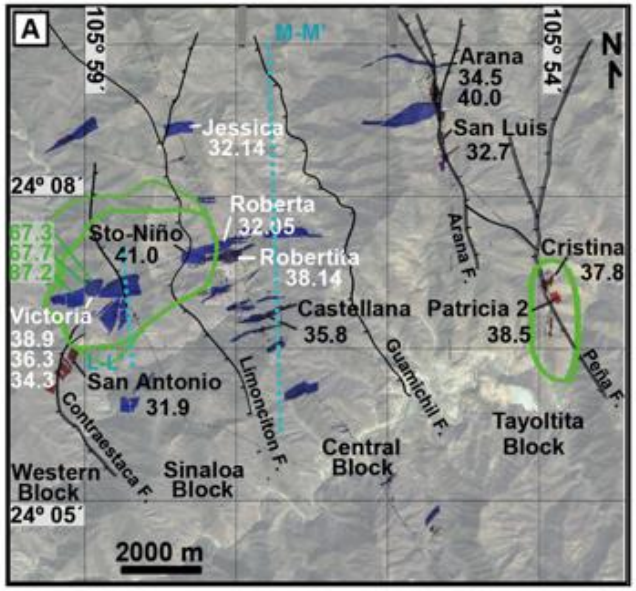
Ag system

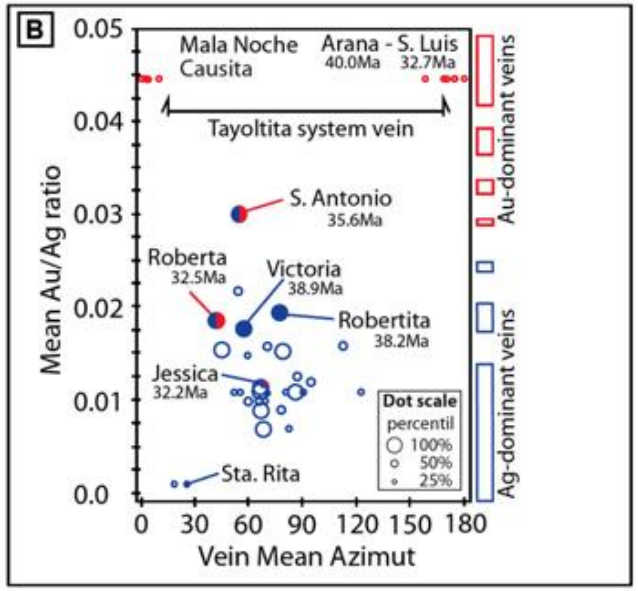
✓EW structural controlled
✓Adularia – rodocrosite – Mg chlorite
✓Pyrite > Chalcopyrite > Galena > Sphalerite
✓Acantite, Jalpaite, Proustite, Polibasite

Phase 1: Open space filling
Phase 2: Crack-seal
Phase 3: Close space

Montoya-Lopera et al., 2020 a
Montoya-Lopera et al., 2020 b

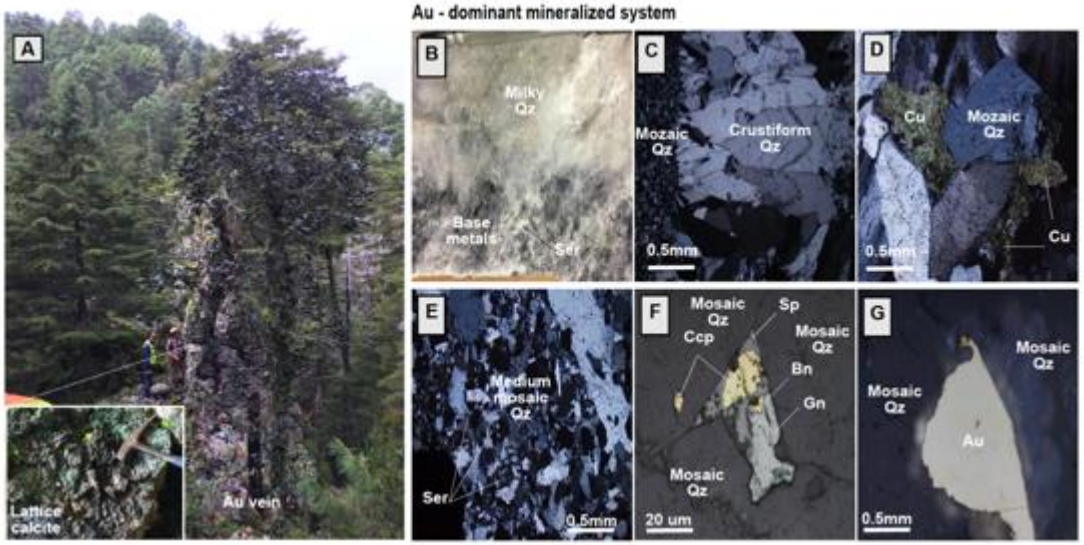
Oligocene Au rich epithermal veins





Au epithermal system

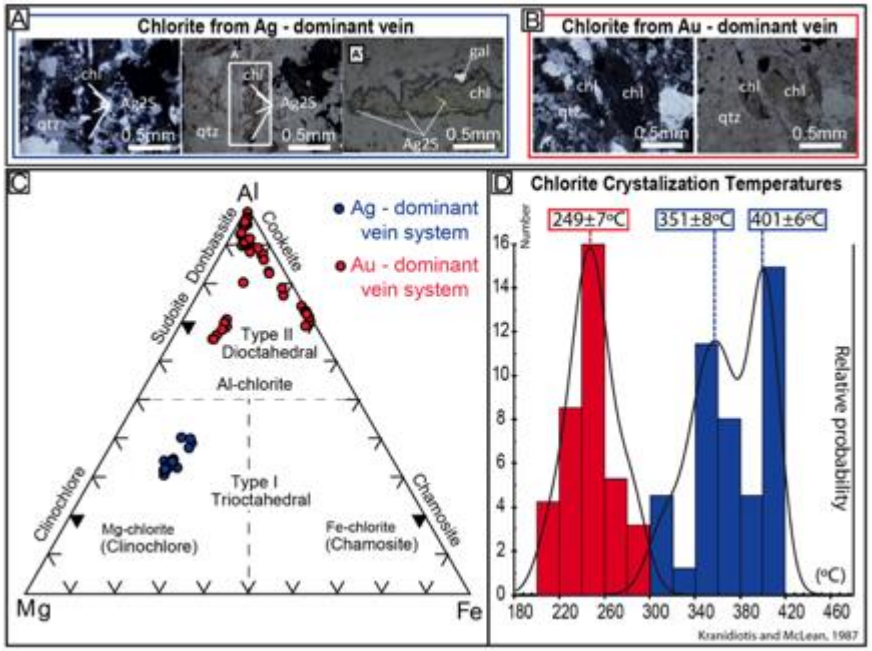
- ✓ NS structural controlled
- ✓ Sericite - Al chlorite
- ✓ Pyrite > Chalcopyrite > Galena > Sphalerite
- ✓ Electrum Au



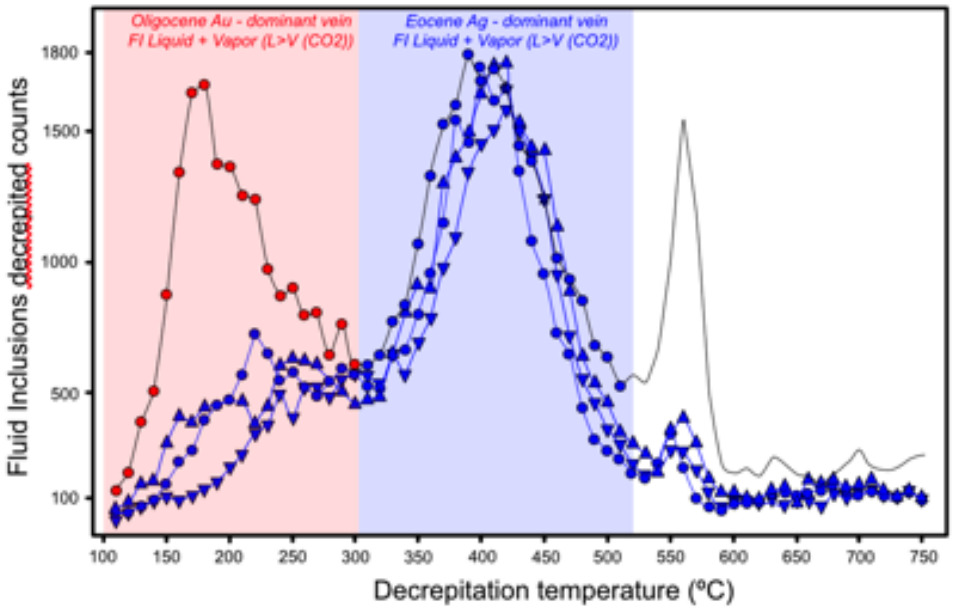
Montoya-Lopera et al., 2020 a
Montoya-Lopera et al., 2020 b

San Dimas Mineralization model: Microthermometry

Geothermometry (Tgeo)



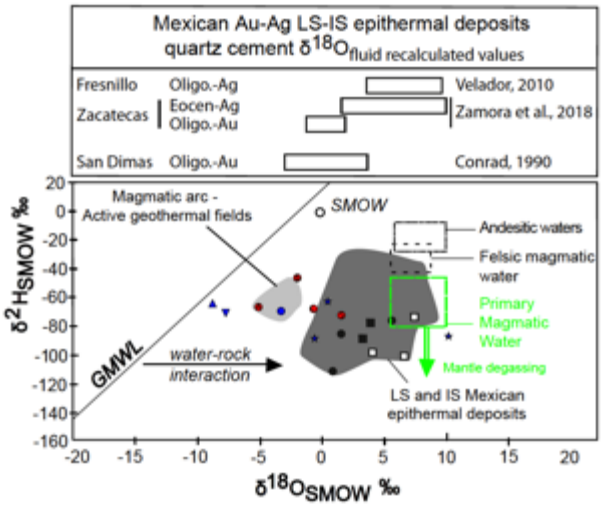
Decriptometry studies (Td)



Montoya-Lopera et al., 2020 a
Montoya-Lopera et al., 2020 b

Hydrothermal fluid characterization

Stable isotopes



Oligocene Au-dominant vein
- Arana vein, Fillingstage
- Causita vein, Fillingstage
- San Antonio vein, Fillingstage
- San Luis vein, Fillingstage

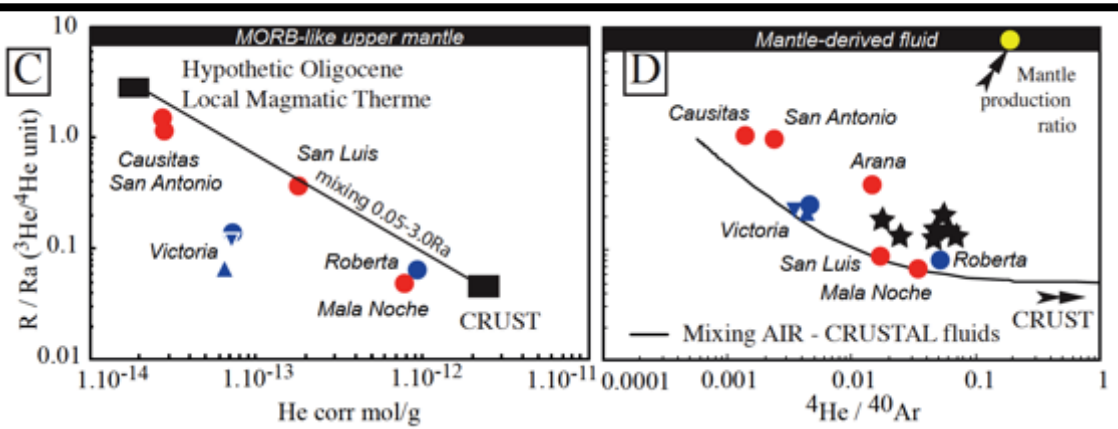
SMO-Oligocene Au-dominant vein
- BACIS (Albinson, 2001)
- Palmajero (Albinson, 2001)
- Panuco (Albinson, 2001)

Eocene Ag-dominantvein

Victoria vein(SinaloaBlock)
- Open space stage
- Filling stage
- Close stage

Robertas(CenterBlock)
- Fillingstage

Nobel gases

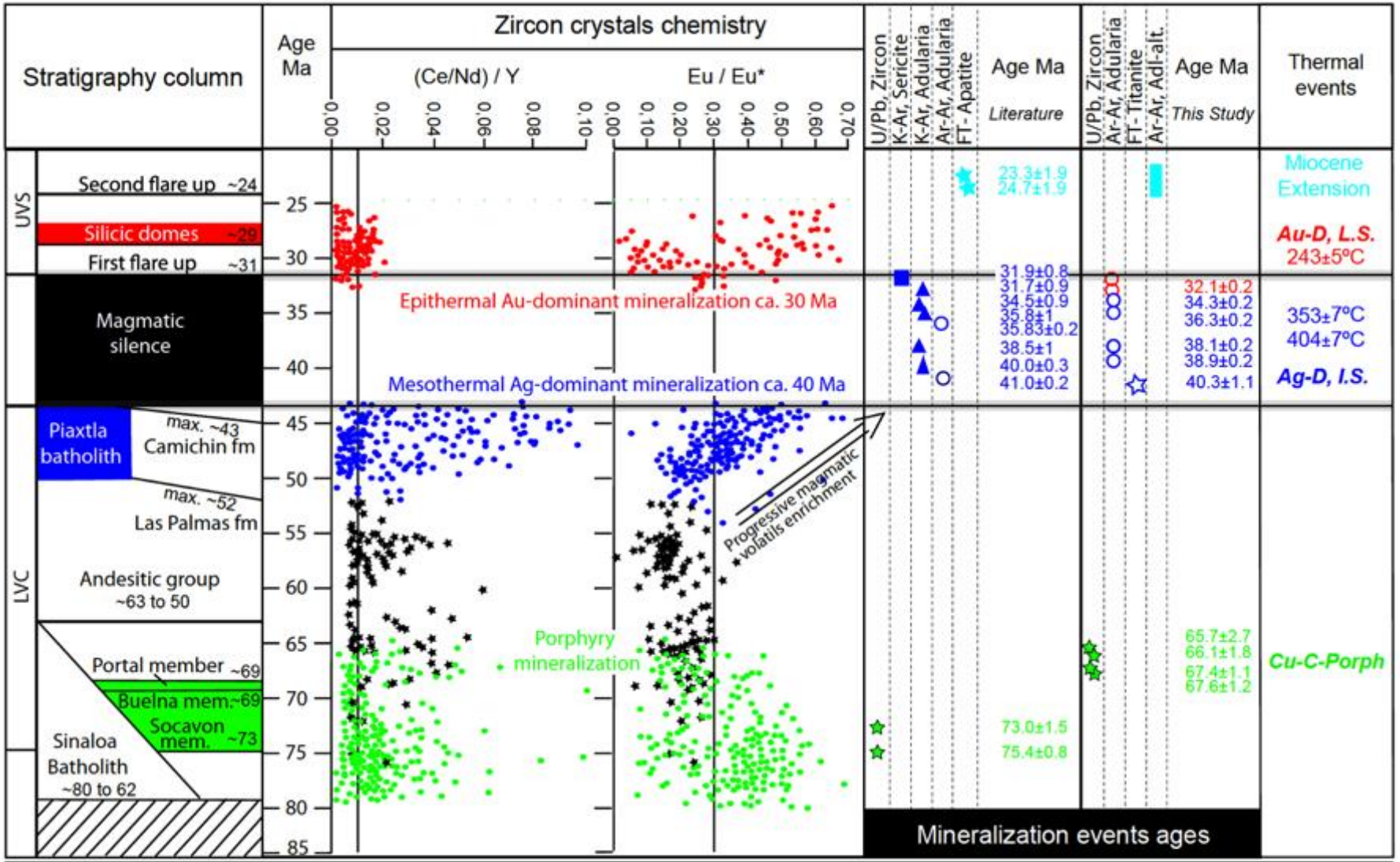


Oligocene Au-dominant vein
- Filling stage
- Select epithermal deposit

Eocene Ag-dominant vein
- Open stage
- Filling stage
- Close sta

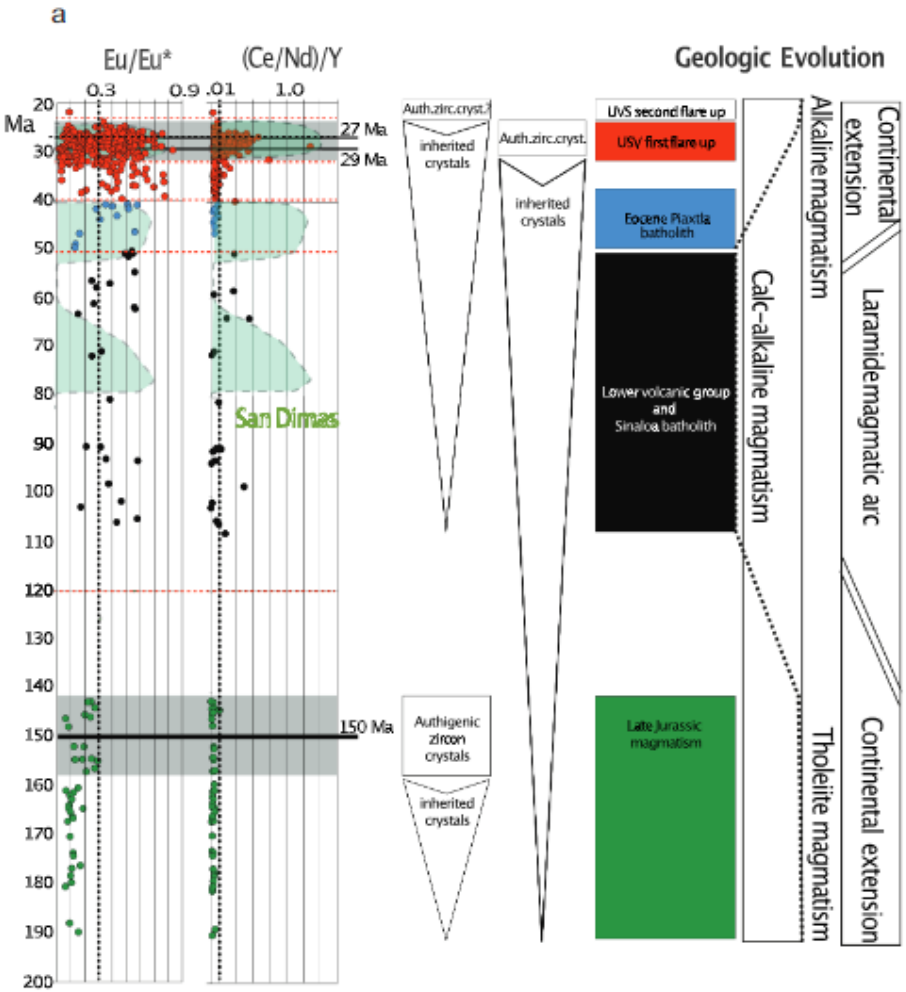
Montoya-Lopera et al., 2020 a
Montoya-Lopera et al., 2020 b

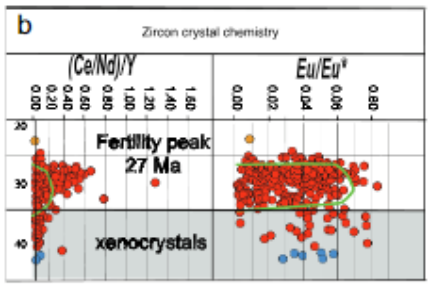
Magmatism and ore deposit development – San Dimas

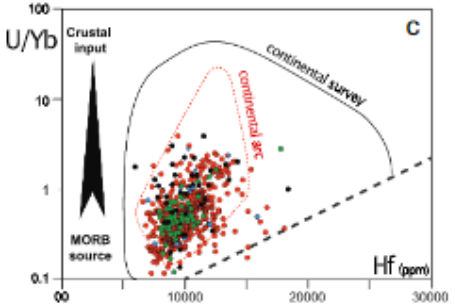


Montoya-Lopera et al., 2020 a

Plomosas system

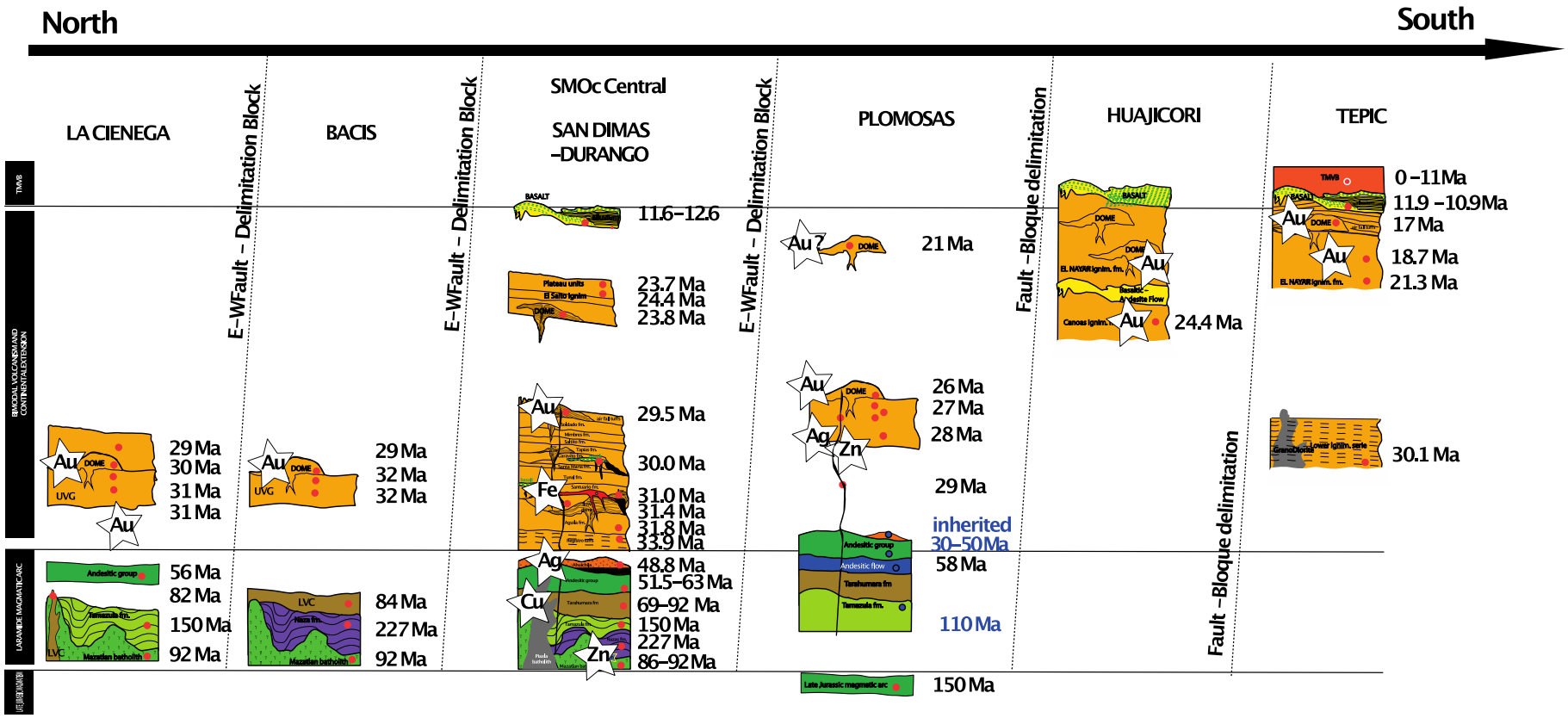






Montoya-Lopera et al., 2024

In a regional context



Montoya-Lopera et al., manuscript

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Thanks

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