

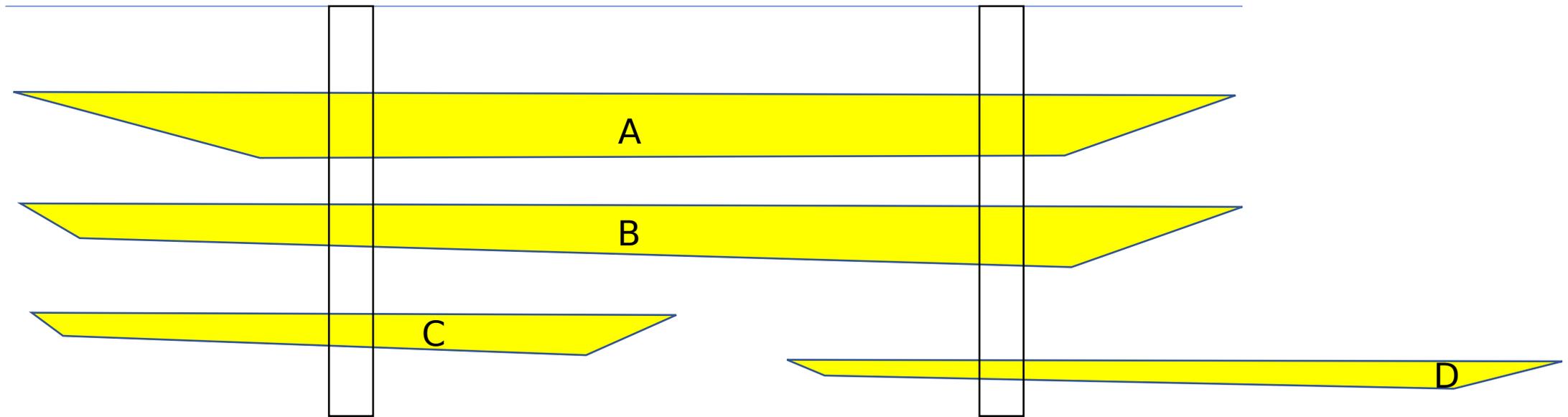
# Arenitos: proveniência e correlação estratigráfica de arenitos

André Oliveira Sawakuchi  
GSA0252-Sedimentologia

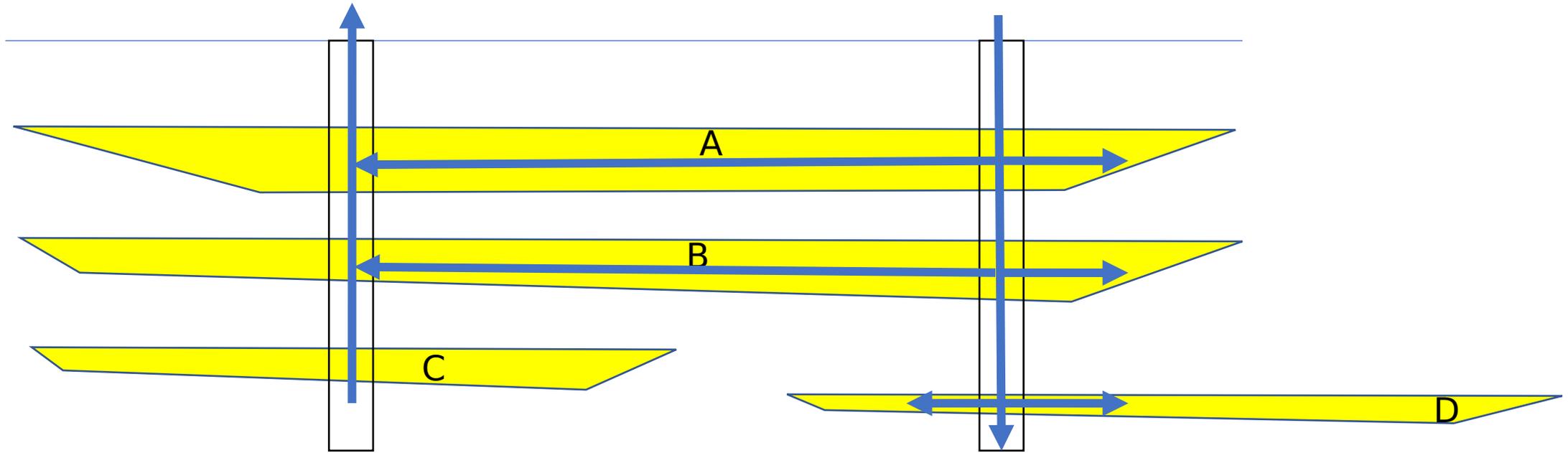
# Problema



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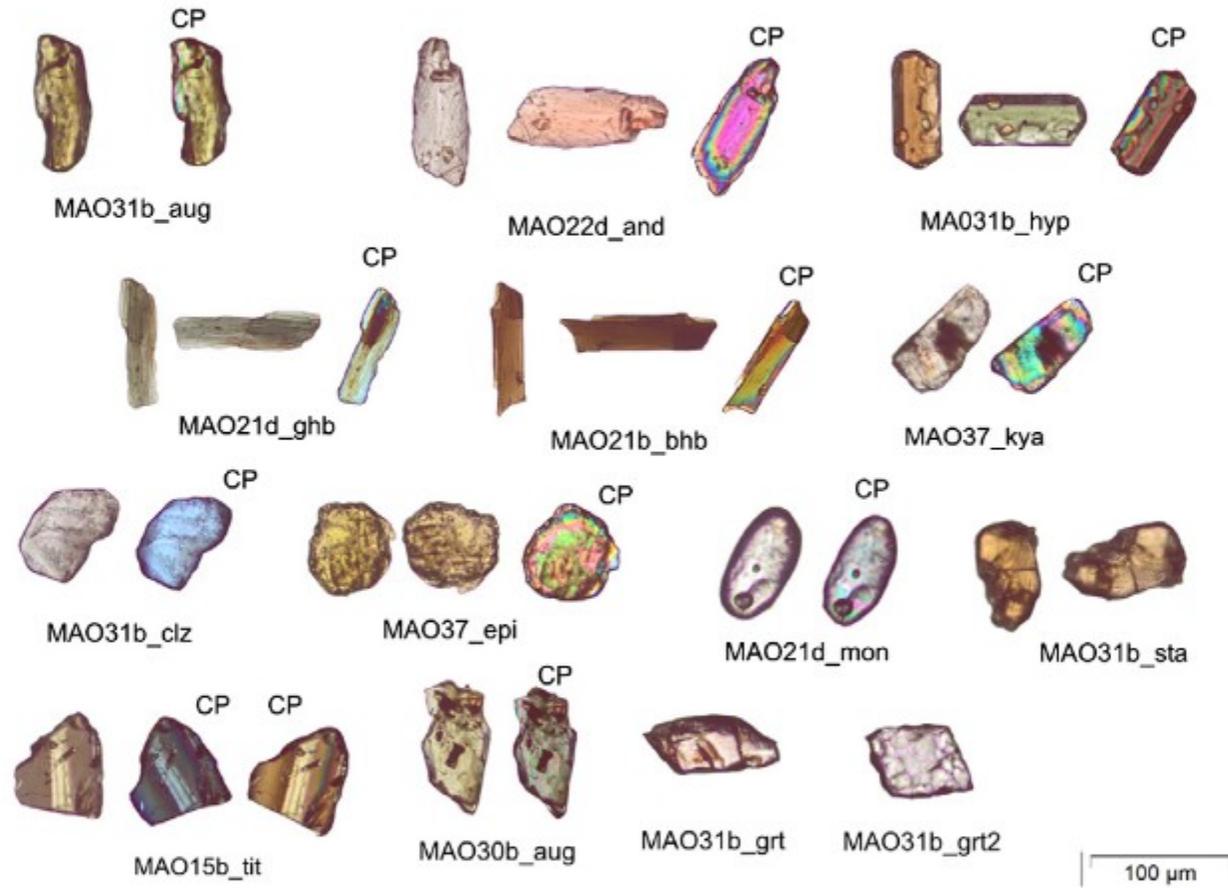


# Minerais pesados



# Minerais pesados (MP) transparentes não-micáceos comuns

- Zircão
- Turmalina
- Rutilo
- Anatásio
- Granada
- Apatita
- Silimanita
- Cianita
- Andaluzita
- Estauroлита
- Epidoto (grupo)
- Titanita
- Anfibólio (grupo)
- Piroxênio (grupo)
- Monazita
- Olivina



# Estabilidade química

Acidic weathering stability pattern	Deep burial stability pattern	Order of persistence
TiO <sub>2</sub> minerals	Apatite, Monazite, Spinel, TiO <sub>2</sub> minerals, Tourmaline, Zircon	TiO <sub>2</sub> minerals
Zircon	Chloritoid	Zircon
Tourmaline	Garnet	Tourmaline
Sillimanite	Staurolite	Monazite
Andalusite	Kyanite	Garnet
Kyanite	Titanite	Apatite
Staurolite	Epidote	Staurolite
Topaz	Calcic amphibole	Kyanite
Titanite	Andalusite, Sillimanite	Epidote
Monazite	Pyroxene	Calcic amphibole
Garnet	Olivine	Andalusite
Epidote		Topaz
Calcic amphibole		Titanite
Orthopyroxene		Clinopyroxene
Clinopyroxene		Sillimanite
Olivine		Orthopyroxene
Apatite		Olivine

**CLASSIFICAÇÃO DE MINERAIS PESADOS  
COMUNS QUANTO A  
ESTABILIDADE FÍSICA E QUÍMICA  
(SEGUNDO PETTIJOHN *et al.* 1972)**

**ULTRAESTÁVEIS:** RUTILO, ZIRCÃO, TURMALINA,  
ANATÁSIO

**ESTÁVEIS:** APATITA, GRANADA (POBRE EM FERRO),  
ESTAUROLITA, MONAZITA, **BIOTITA**, ILMENITA,  
MAGNETITA

**MODERADAMENTE ESTÁVEIS:** EPÍDOTO,  
CIANITA, GRANADA (RICA EM FERRO), SILLIMANITA,  
TITANITA, ZOISITA

**INSTÁVEIS:** HORNBLENDA, ACTINOLITA, AUGITA,  
DIOPSÍDIO, HIPERSTÊNIO, ANDALUZITA

**MUITO INSTÁVEIS:** OLIVINA

Legenda de cores:

**filossilicatos**  
**anfibólios**  
**piroxênios**  
olivina

# *1. Peneiramento*

- Areia fina ou muito fina
- $\geq$  Areia média



# 2. Separação densimétrica

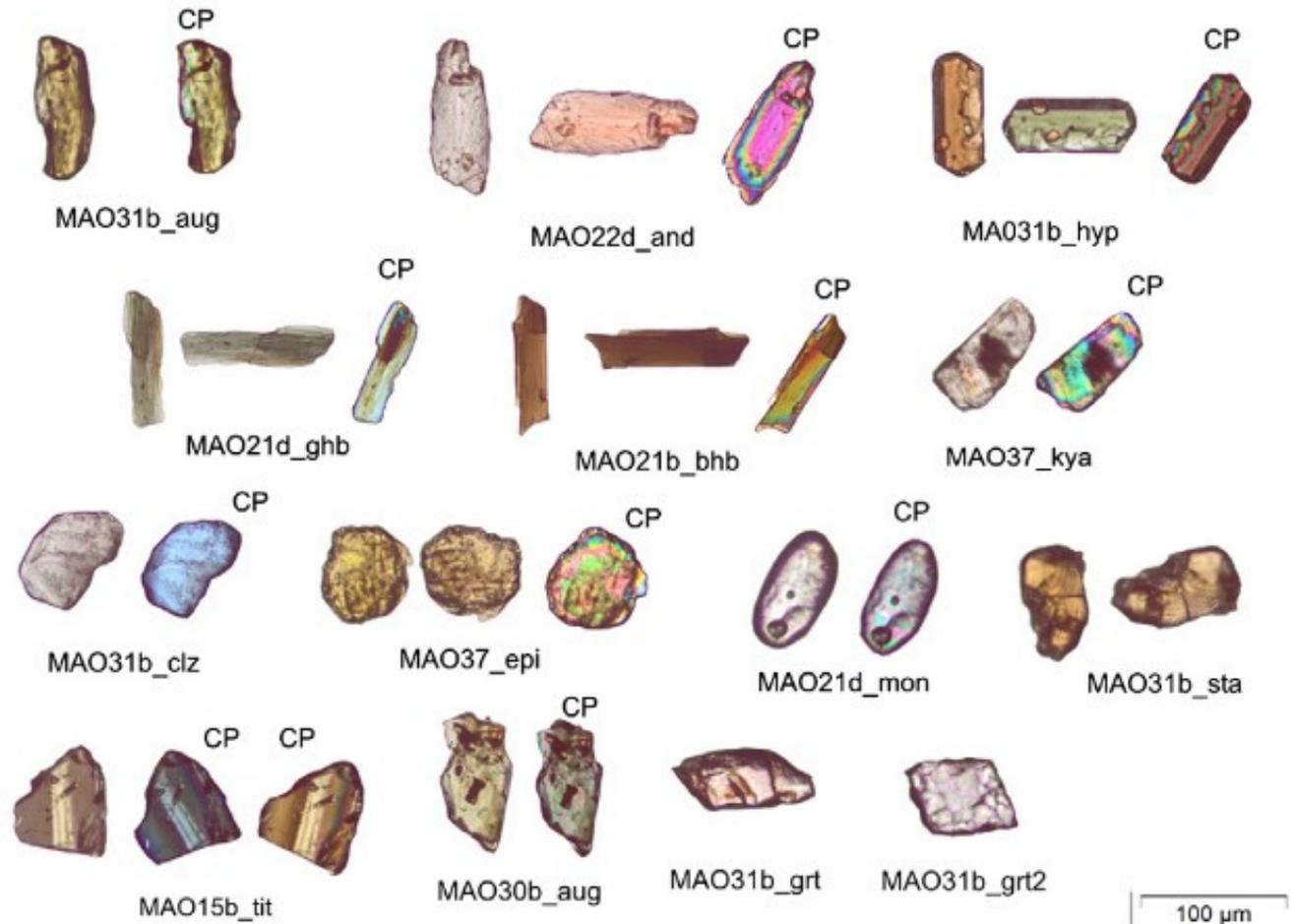
LÍQUIDO	COMPOSIÇÃO	DENSIDADE MÁXIMA	SOLVENTE
Bromofórmio	$\text{CHBr}_3$	2,88	Benzol, xileno, tetracloreto de carbono, etilenobromida, álcool
Tetrabromoetano	$\text{C}_2\text{H}_2\text{Br}_4$	2,95	Benzol, xileno, tetracloreto de carbono, etilenobromida
Solução de Thoulet	$\text{KI} + \text{HgI}_2$ (aq.)	3,19	 Água
Iodeto de metileno	$\text{CH}_2\text{I}_2$	3,33	Benzol, xileno, tetracloreto de carbono
Solução de Clerici	Malonato + formiato de tálio (aq.)	4,2	 Água
Politungstato de sódio	$3\text{Na}_2\text{WO}_4 * 9\text{WO}_3 * \text{H}_2\text{O}$ (aq.)	3,5	 Água



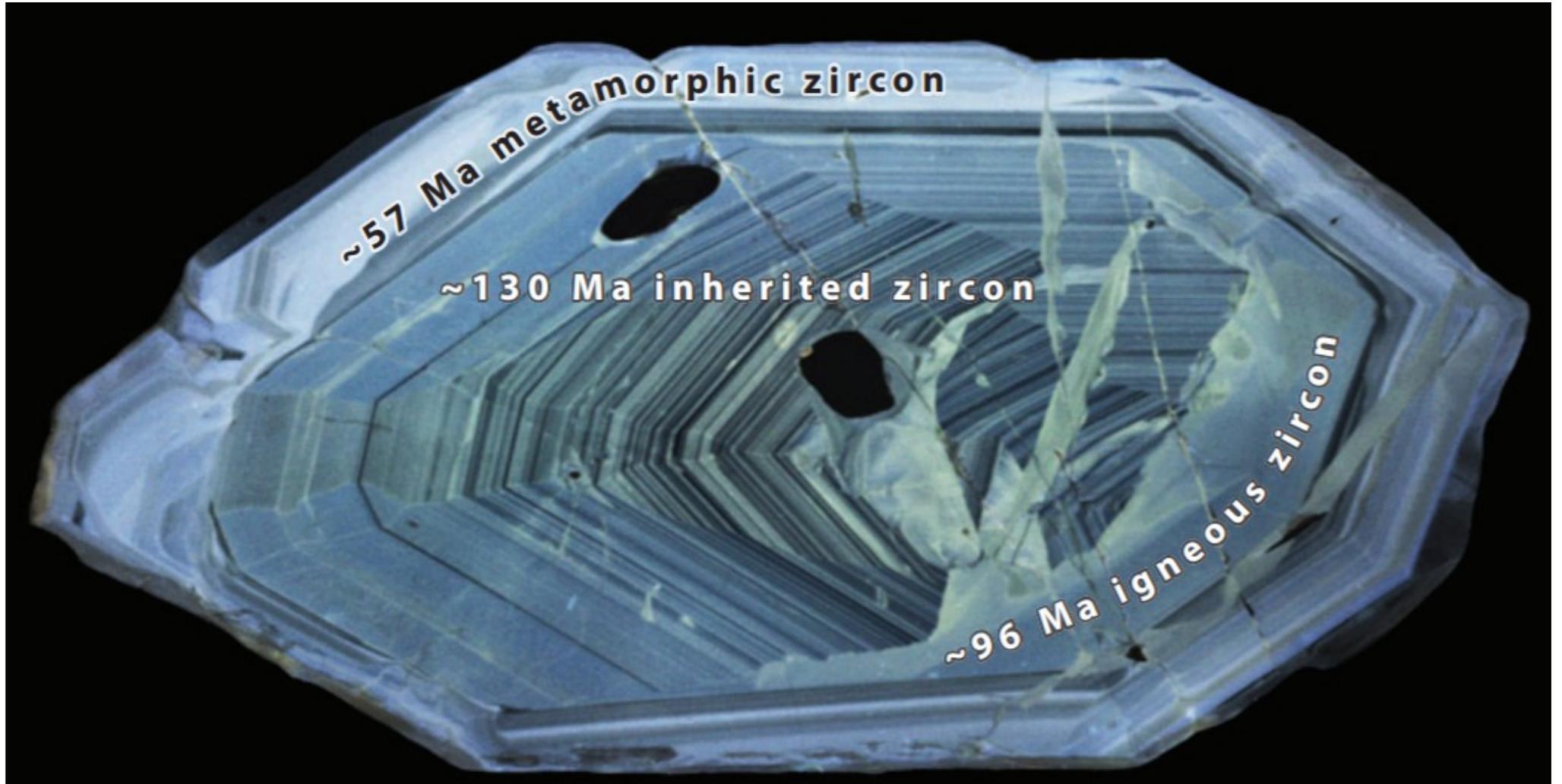
### 3. Montagem de lâminas de grãos

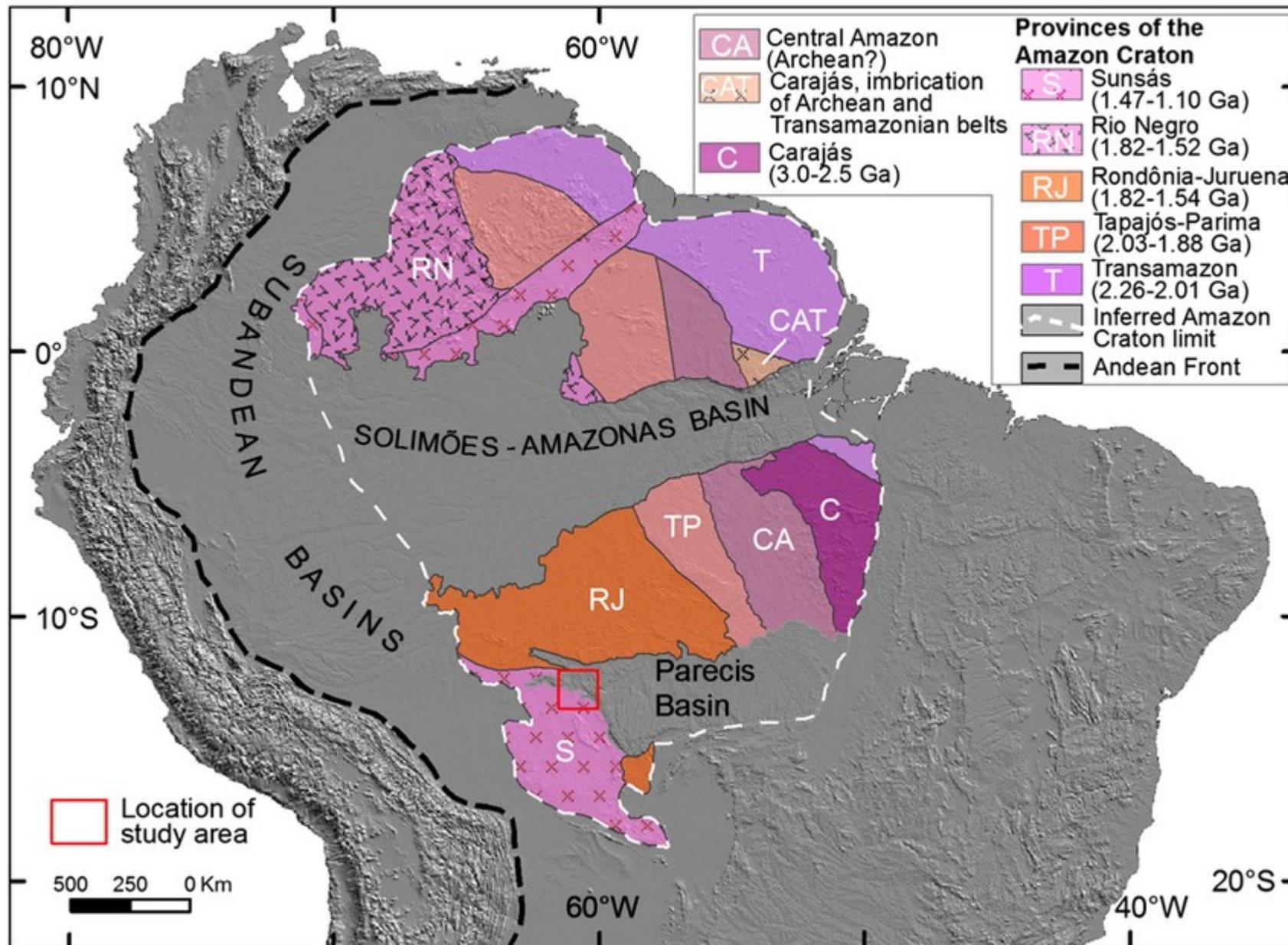


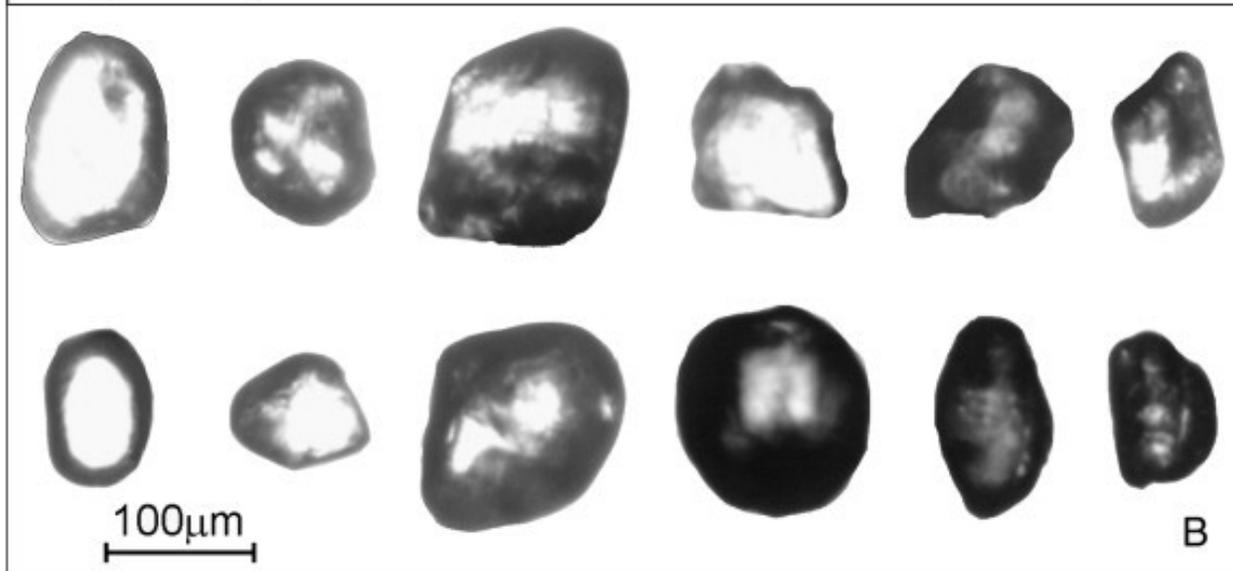
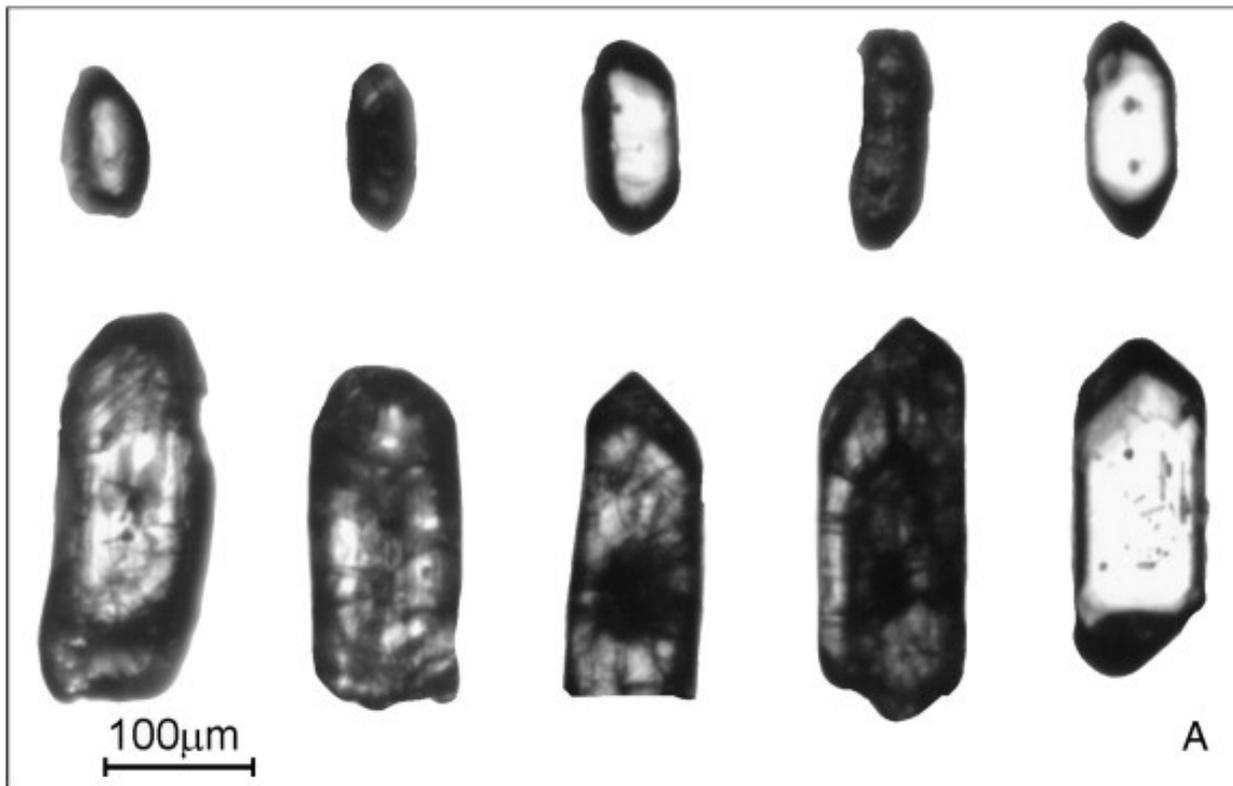
# 4. Identificação e quantificação ao microscópio óptico



# Zircões detríticos - Idades U-Pb









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Sedimentary Geology 182 (2005) 3–28

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**Sedimentary  
Geology**

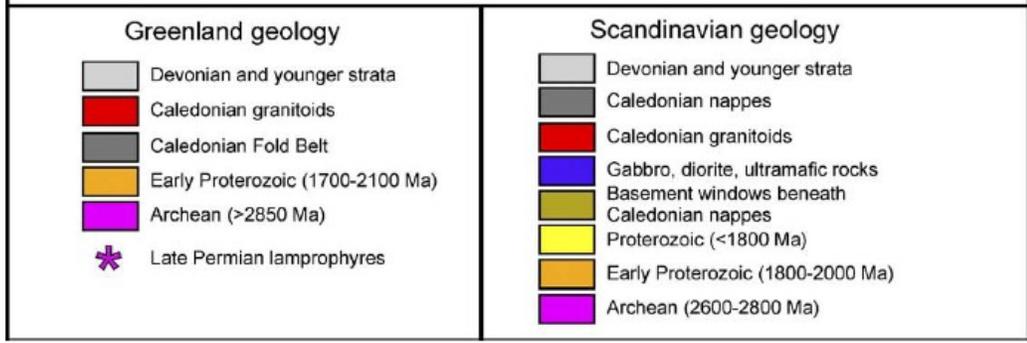
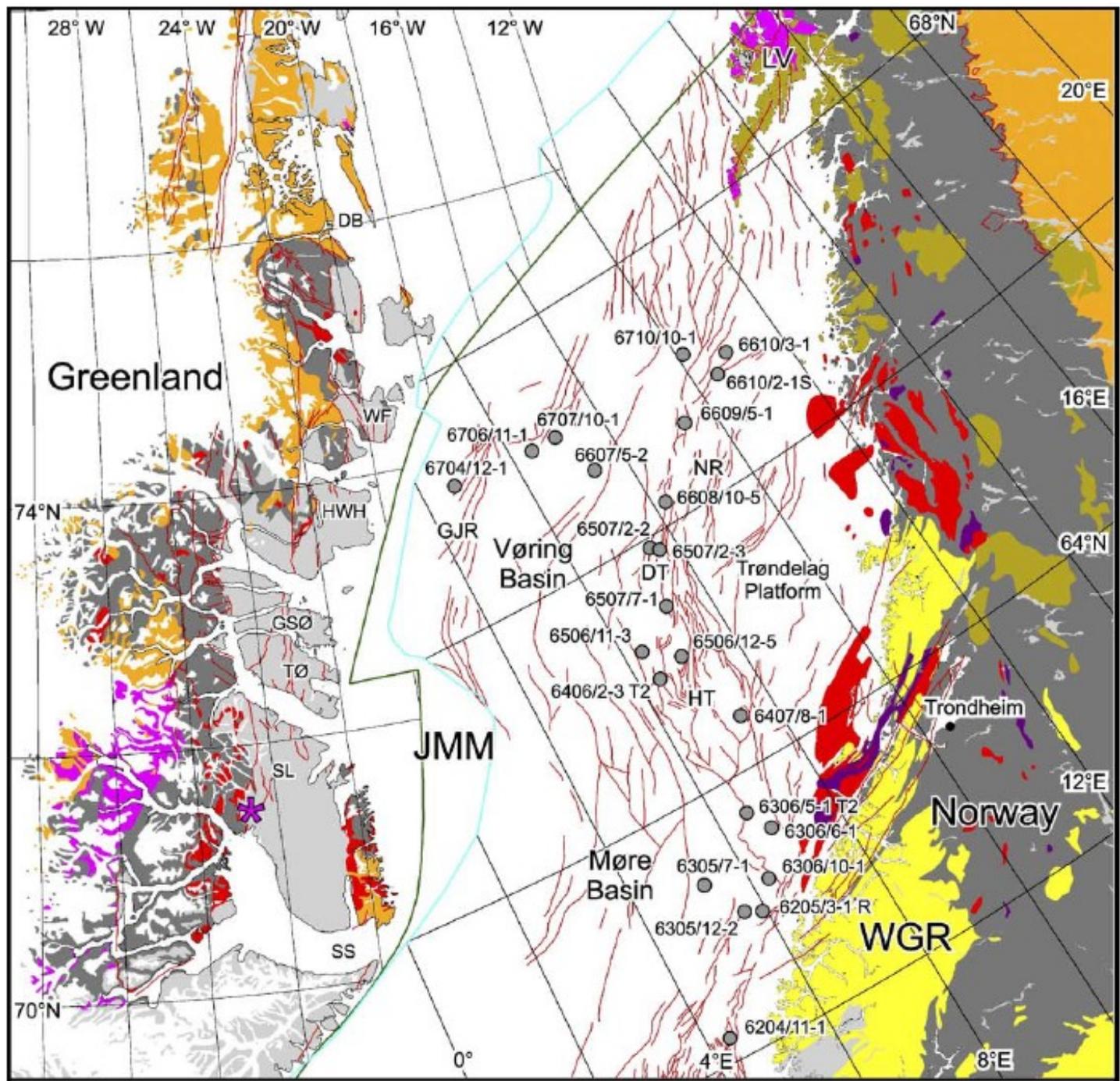
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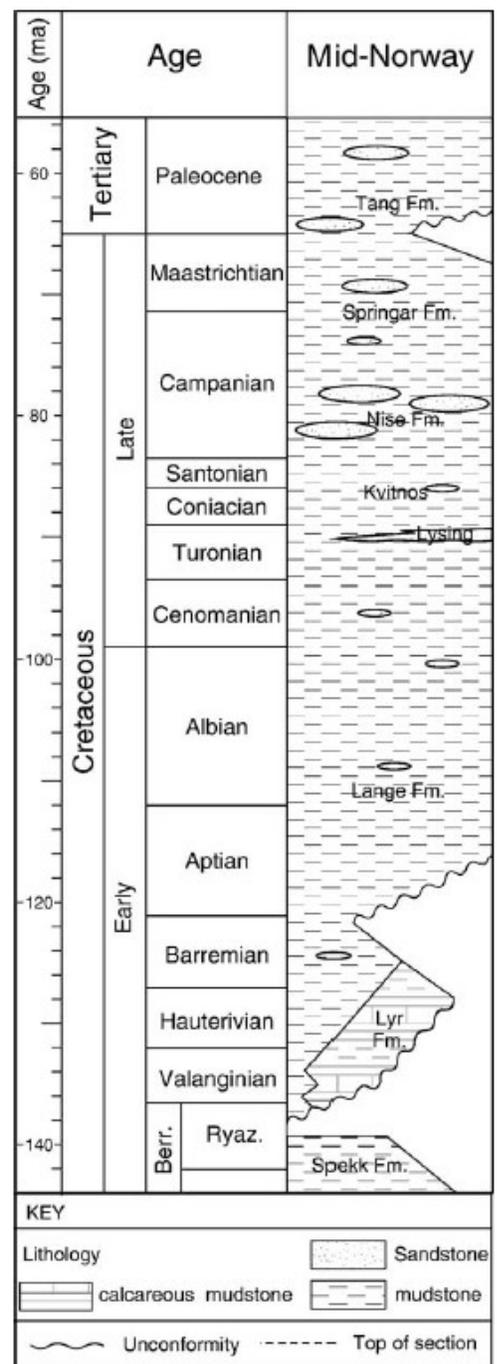
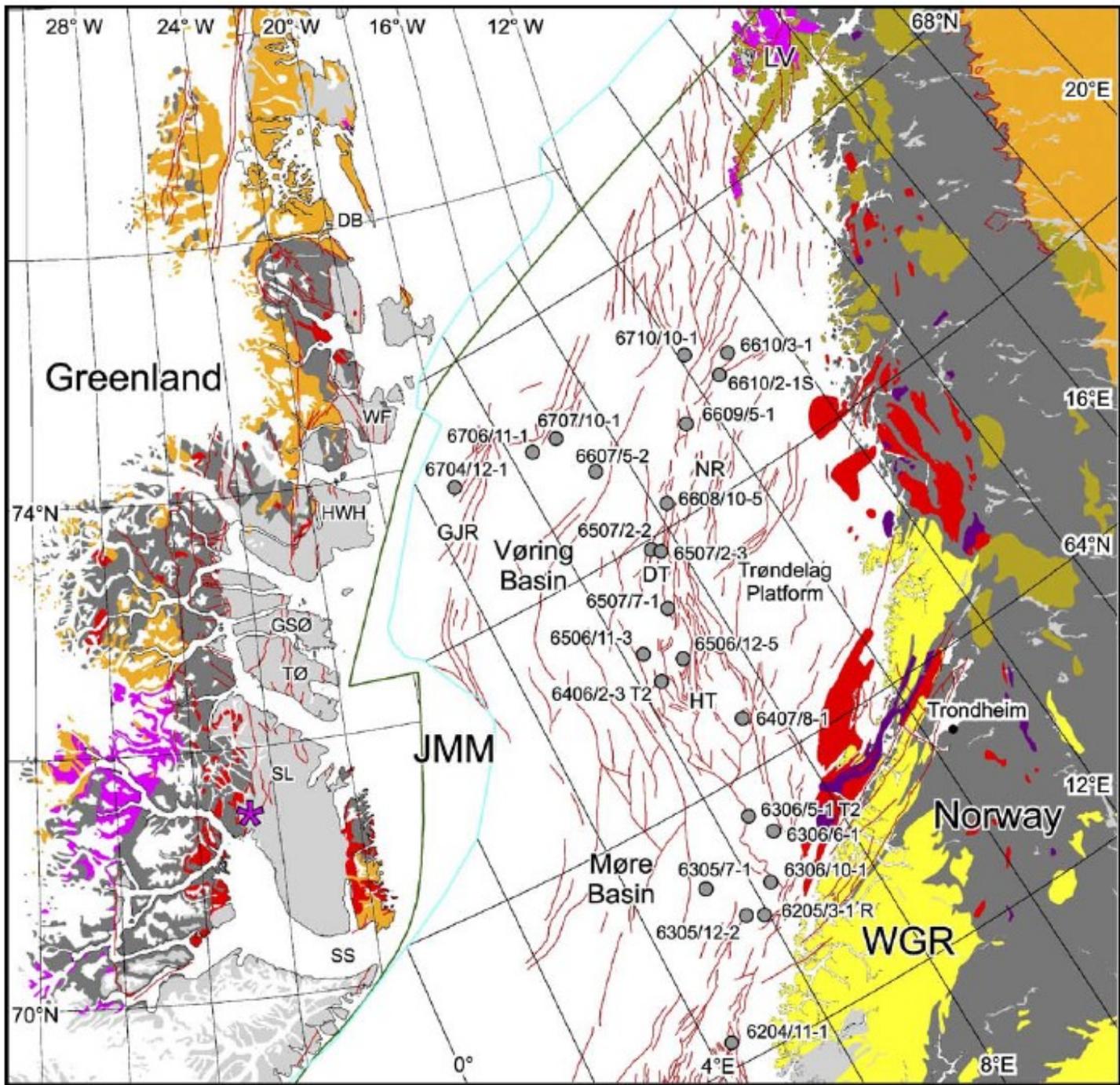
[www.elsevier.com/locate/sedgeo](http://www.elsevier.com/locate/sedgeo)

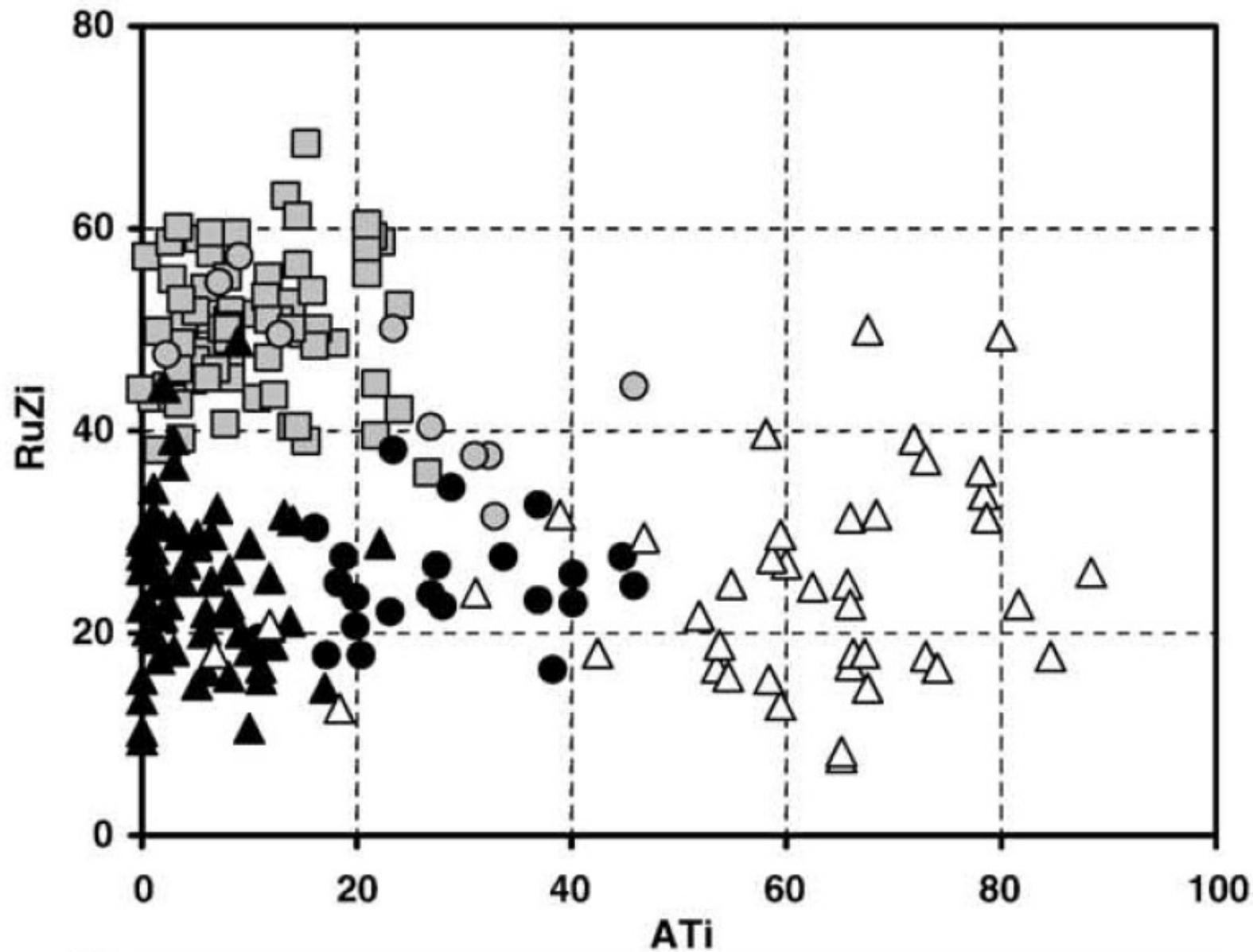
Provenance of Late Cretaceous to Paleocene submarine fan  
sandstones in the Norwegian Sea: Integration of heavy mineral,  
mineral chemical and zircon age data

A.C. Morton <sup>a,b,\*</sup>, A.G. Whitham <sup>c</sup>, C.M. Fanning <sup>d</sup>



Morton et al. (2005)

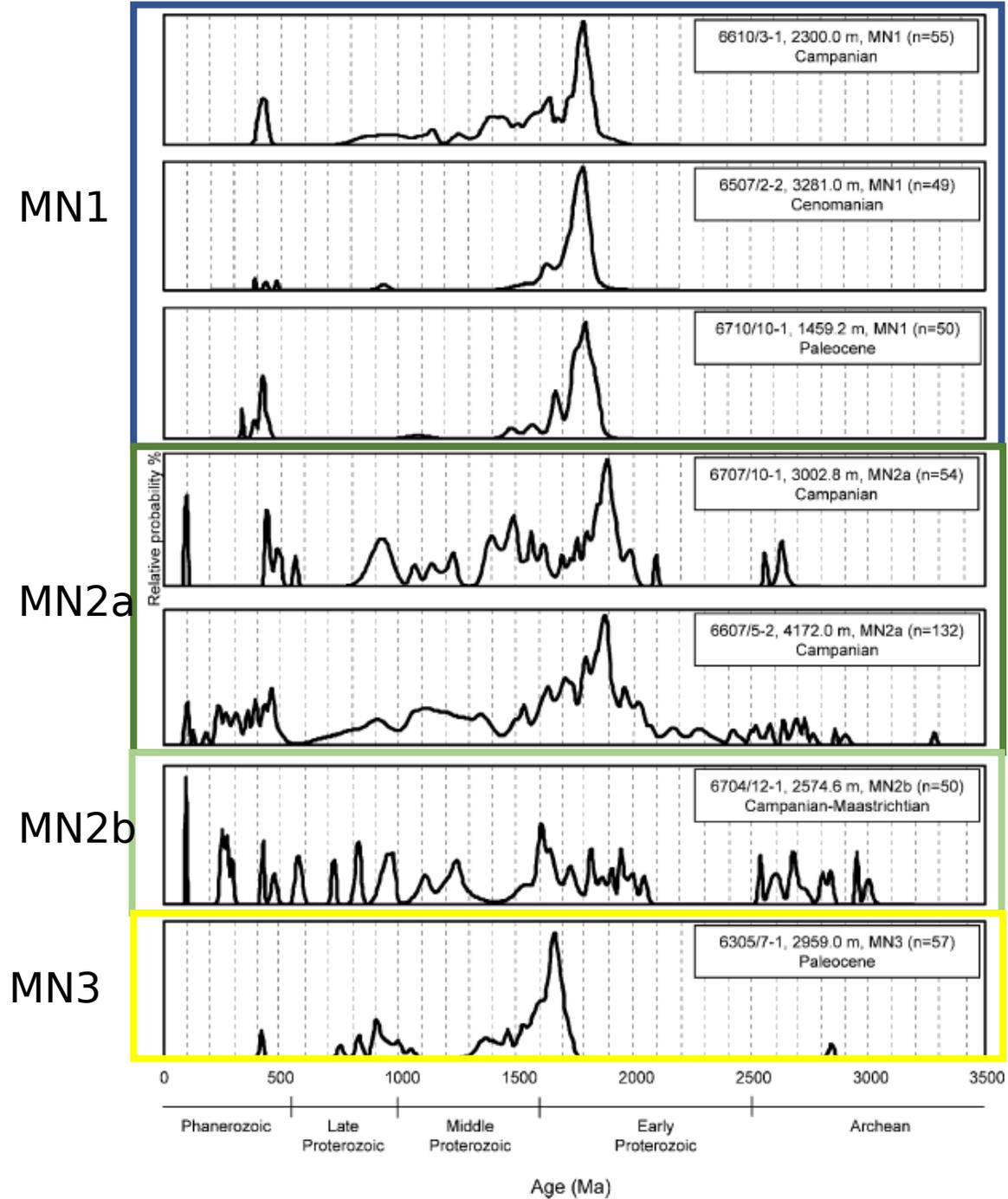


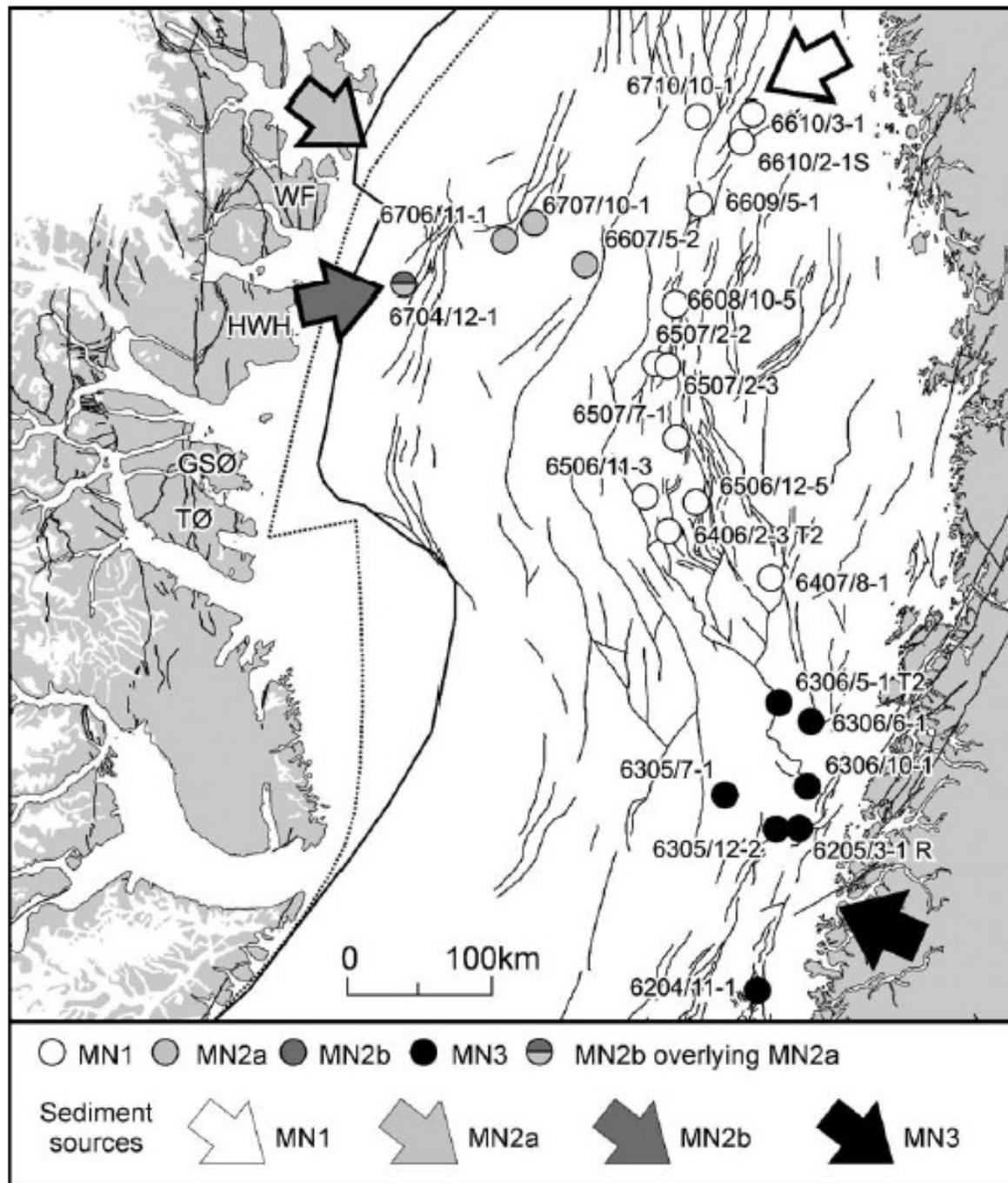


- $\square$  MN1 (other wells)
- $\circ$  MN1 (6407/8-1, 6406/3-2T2)
- $\blacktriangle$  MN2a
- $\bullet$  MN2b
- $\triangle$  MN3

$$\text{RuZi} = \left[ \frac{\text{rutilo}}{\text{rutilo} + \text{zircão}} \right] \times 100$$

$$\text{ATi} = \left[ \frac{\text{apatita}}{\text{apatita} + \text{turmalina}} \right] \times 100$$





# Composição do arcabouço vs porosidade

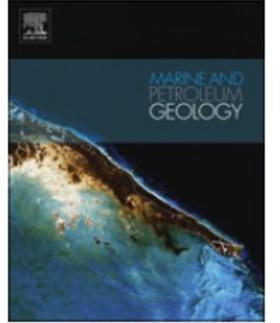
Marine and Petroleum Geology 35 (2012) 139–153



Contents lists available at [SciVerse ScienceDirect](#)

## Marine and Petroleum Geology

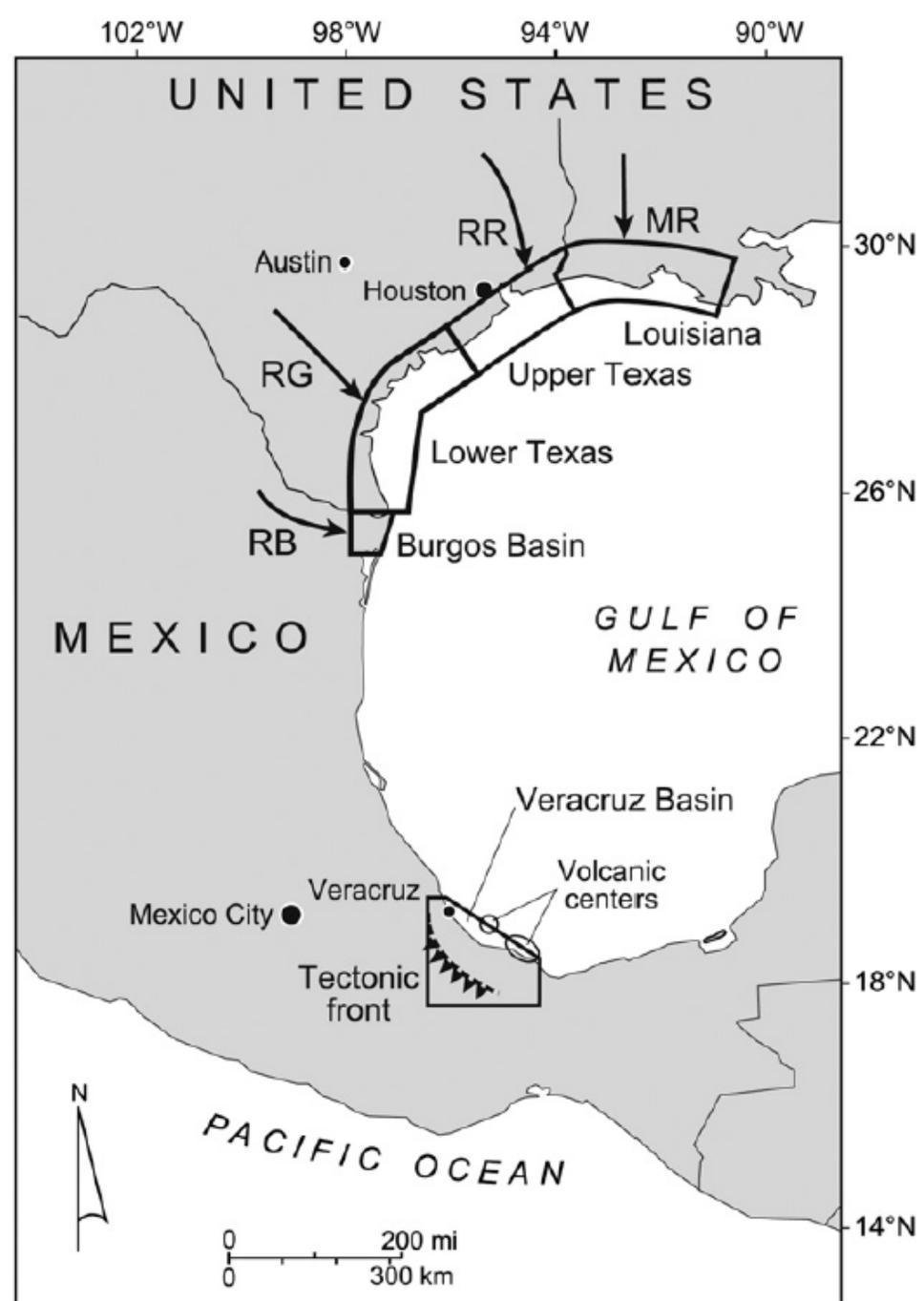
journal homepage: [www.elsevier.com/locate/marpetgeo](http://www.elsevier.com/locate/marpetgeo)



### Impact of regional variation in detrital mineral composition on reservoir quality in deep to ultradeep lower Miocene sandstones, western Gulf of Mexico

Shirley P. Dutton\*, Robert G. Loucks, Ruarri J. Day-Stirrat

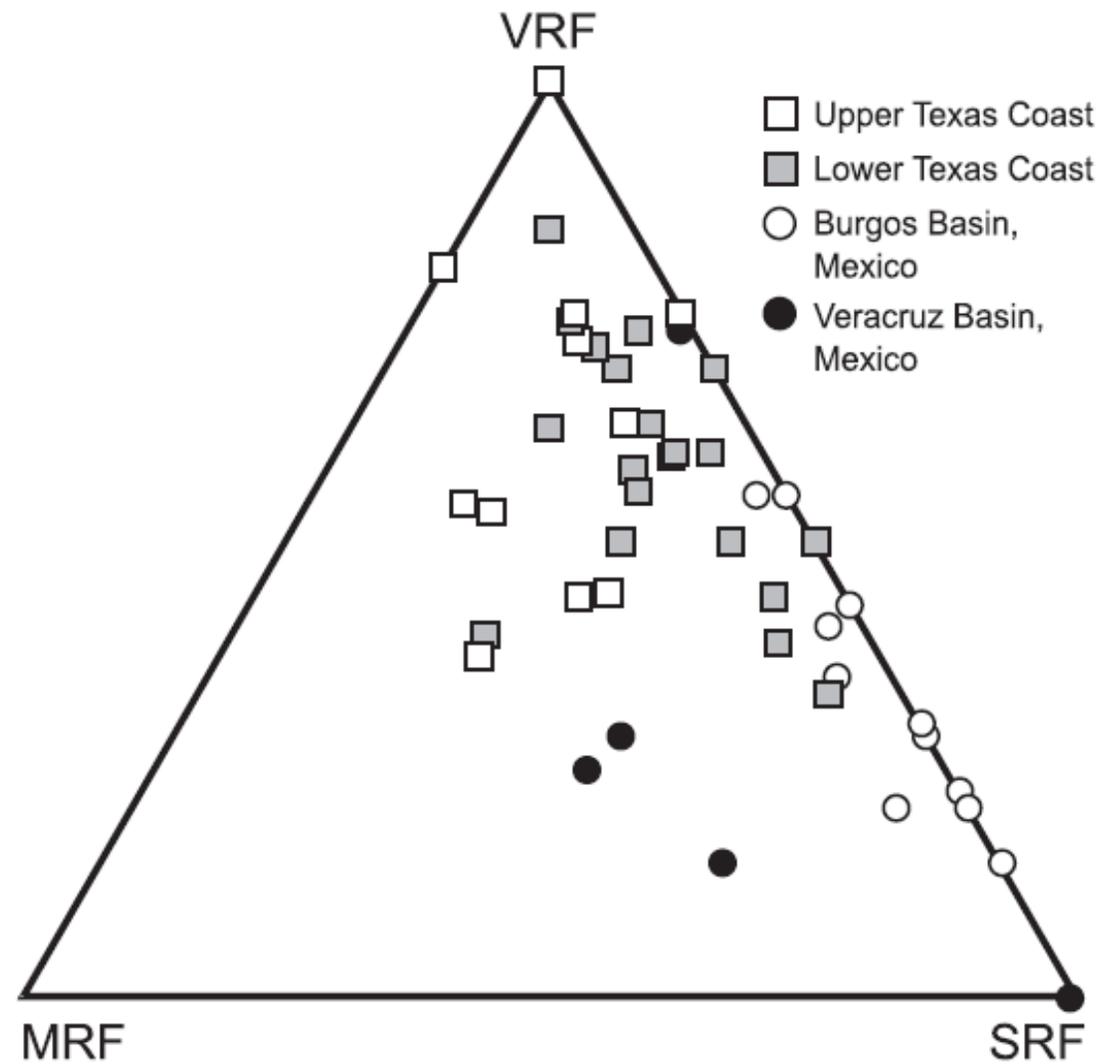
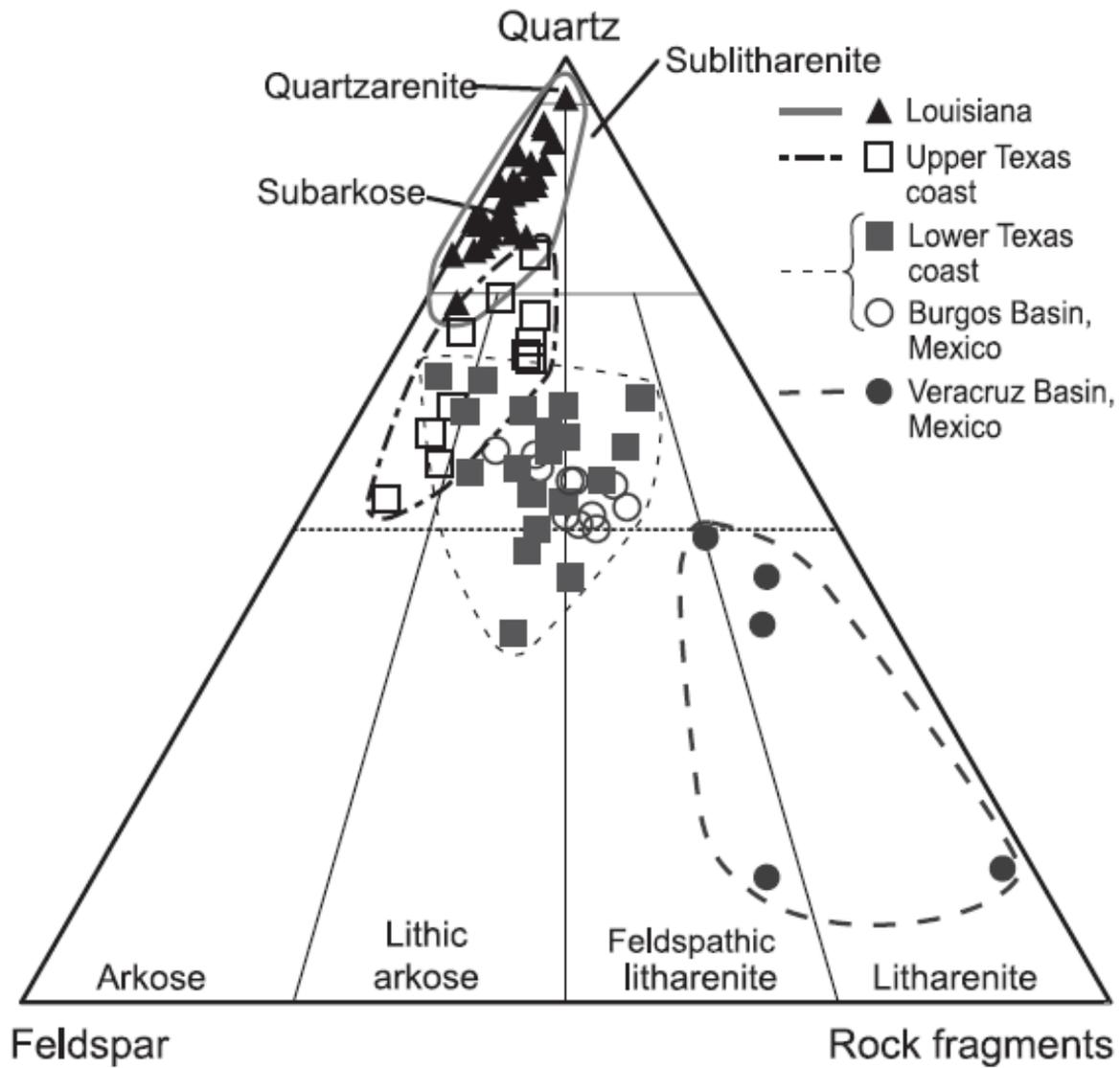
*Bureau of Economic Geology, Jackson School of Geosciences, The University of Texas at Austin, Austin, TX 78713, USA*

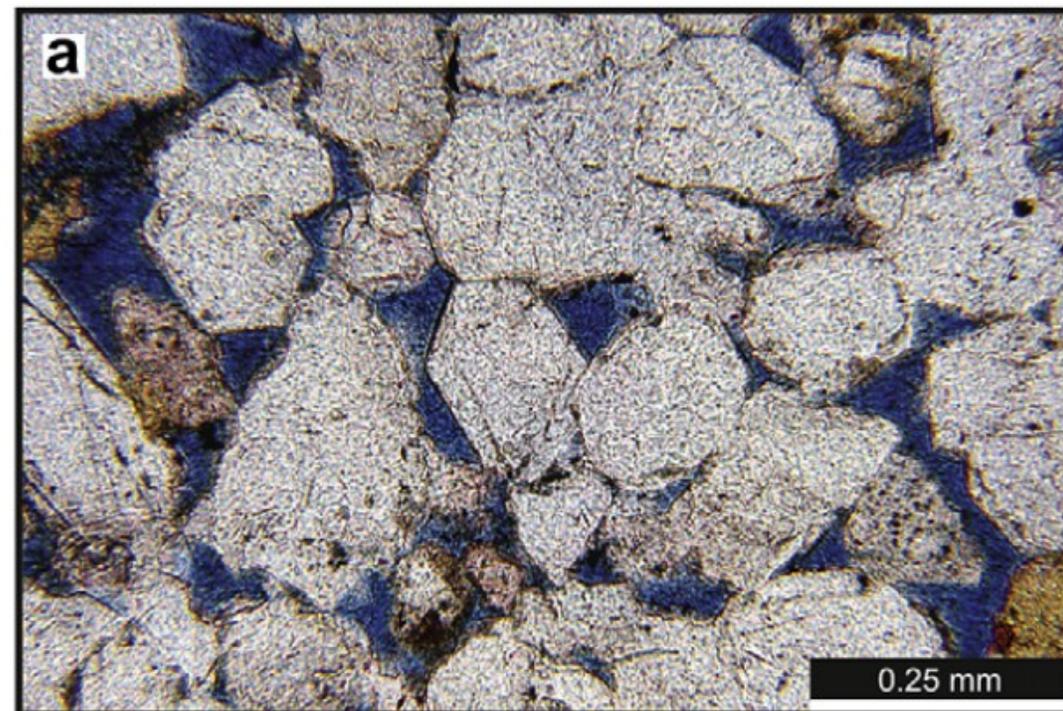
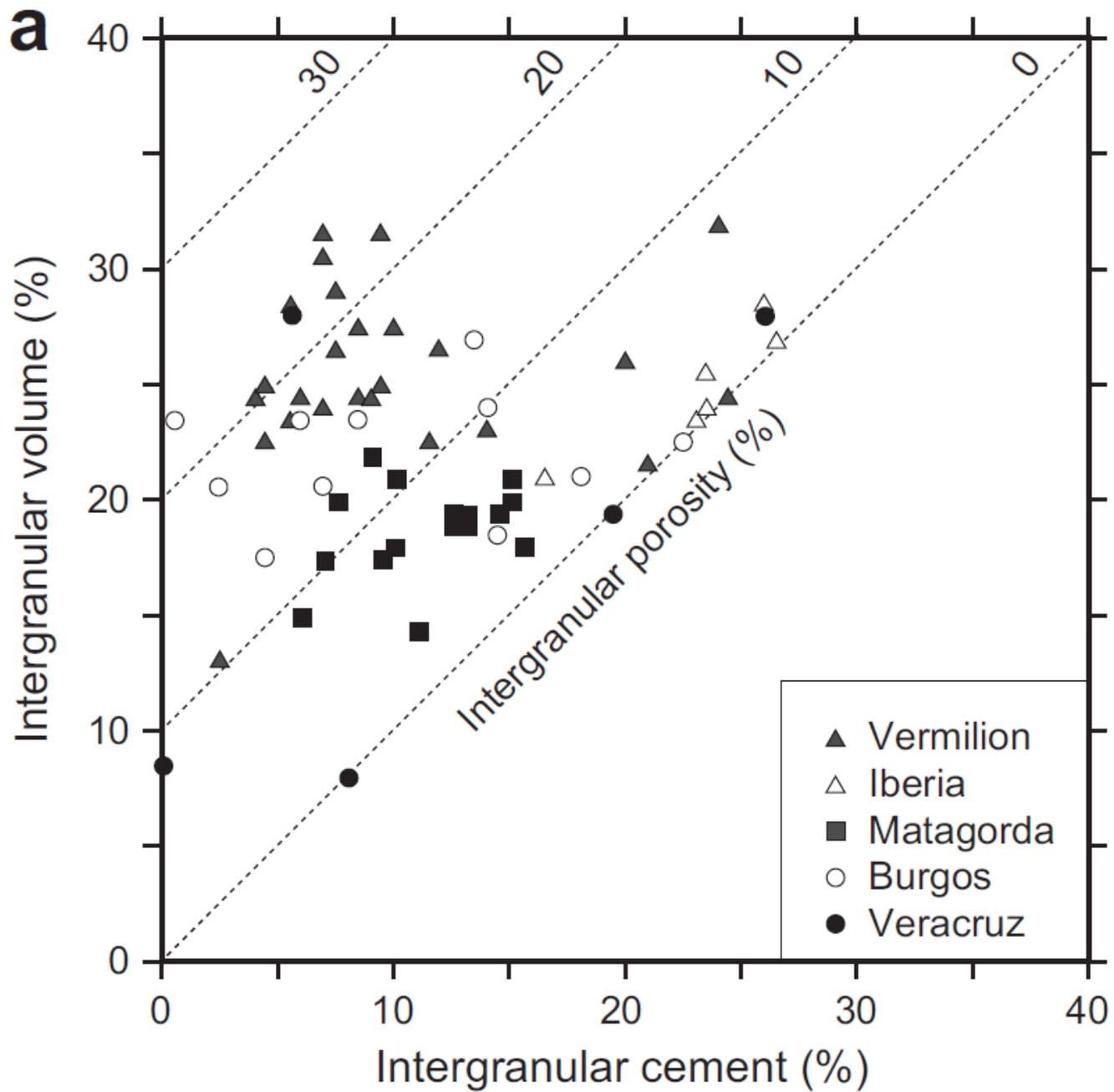


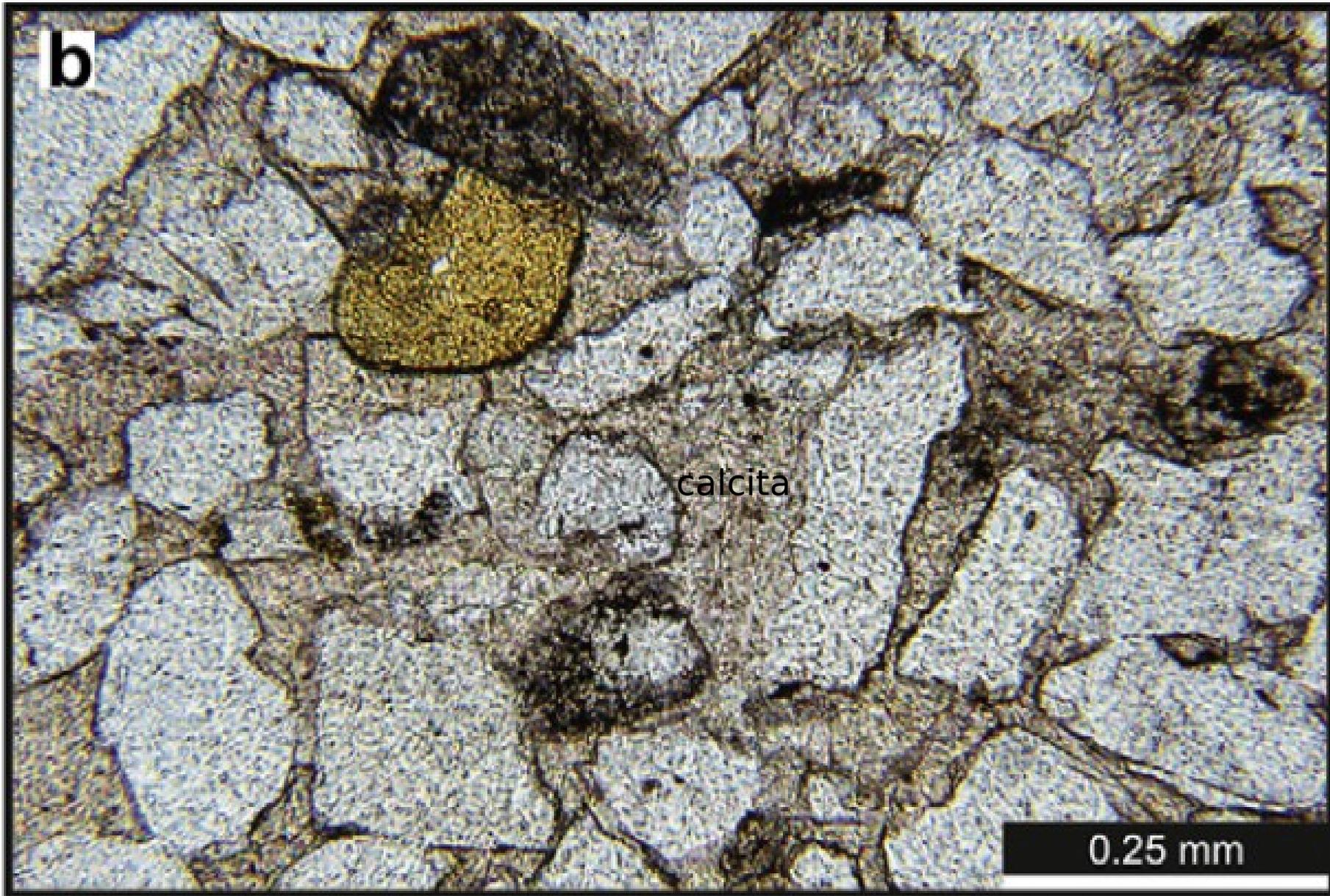
**Table 1**

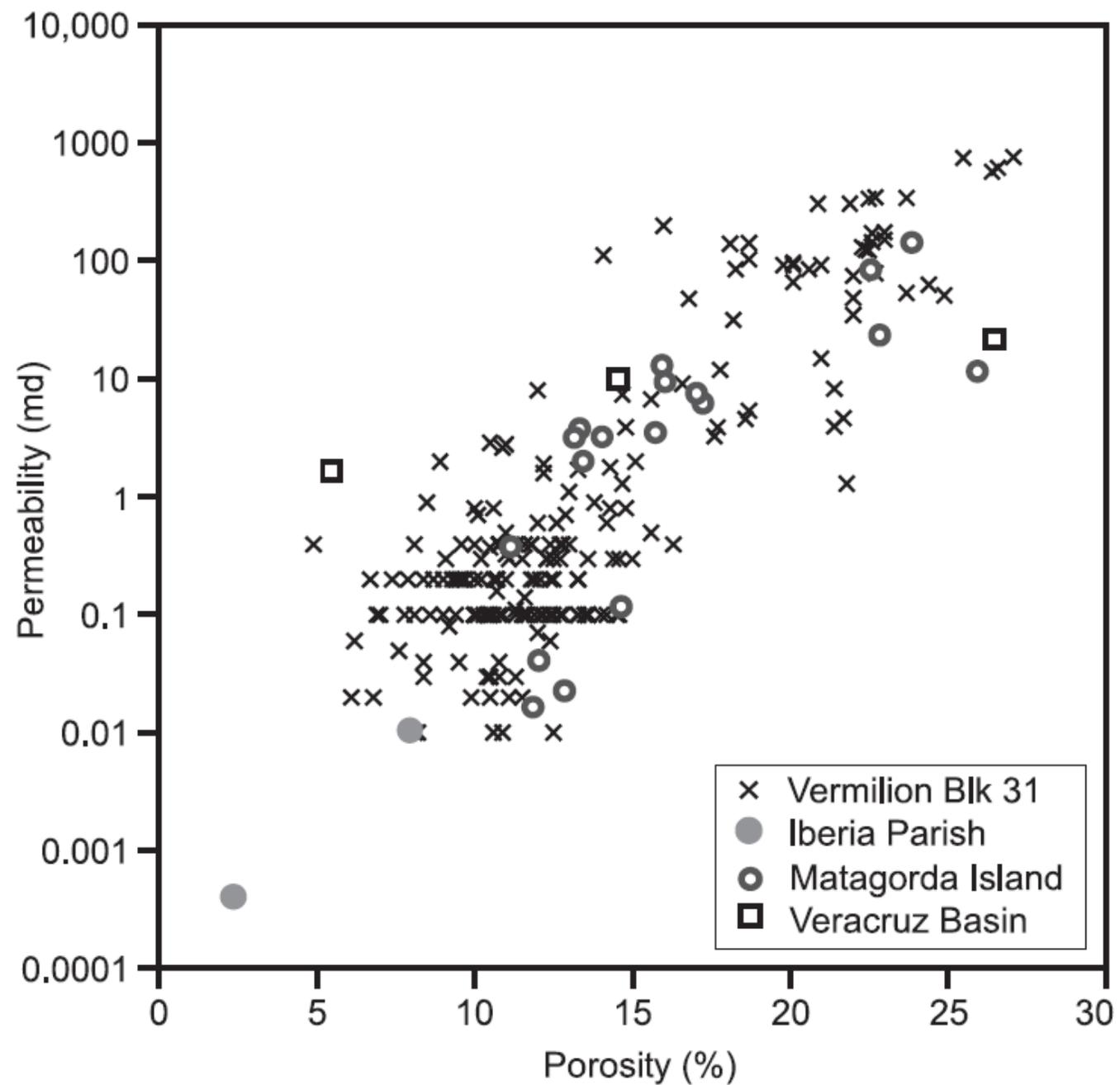
Petrographic summary by area.

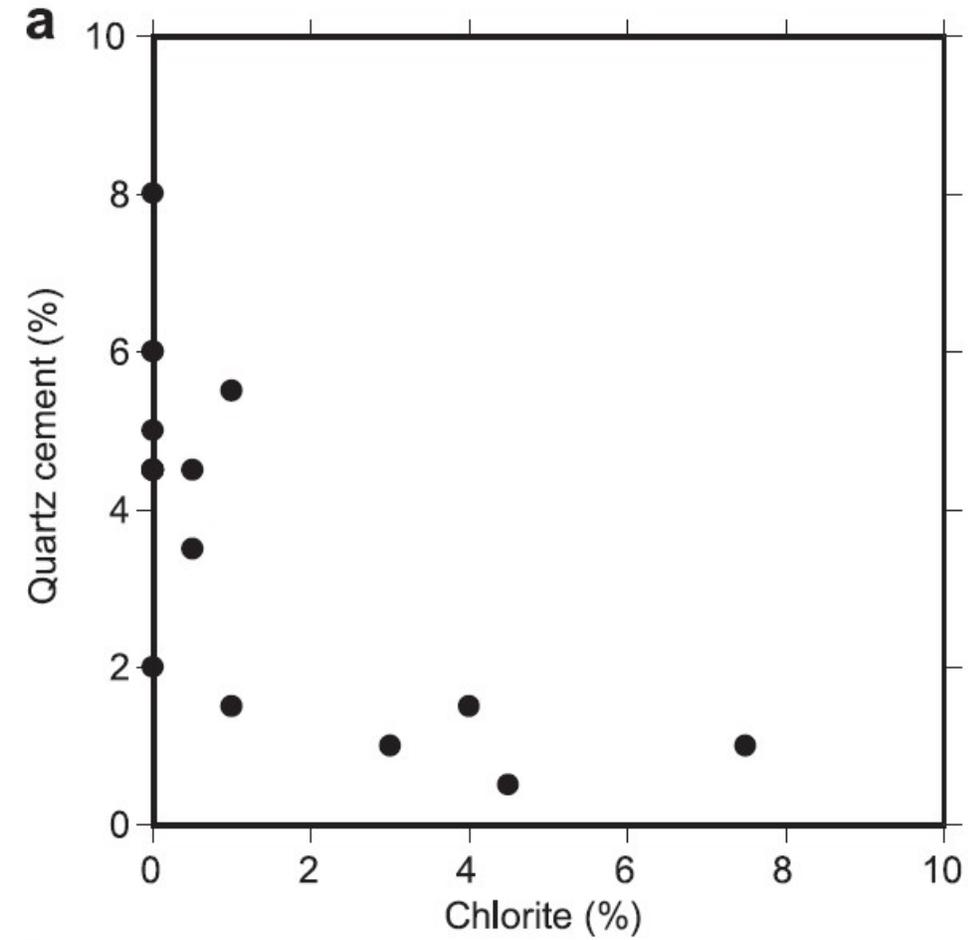
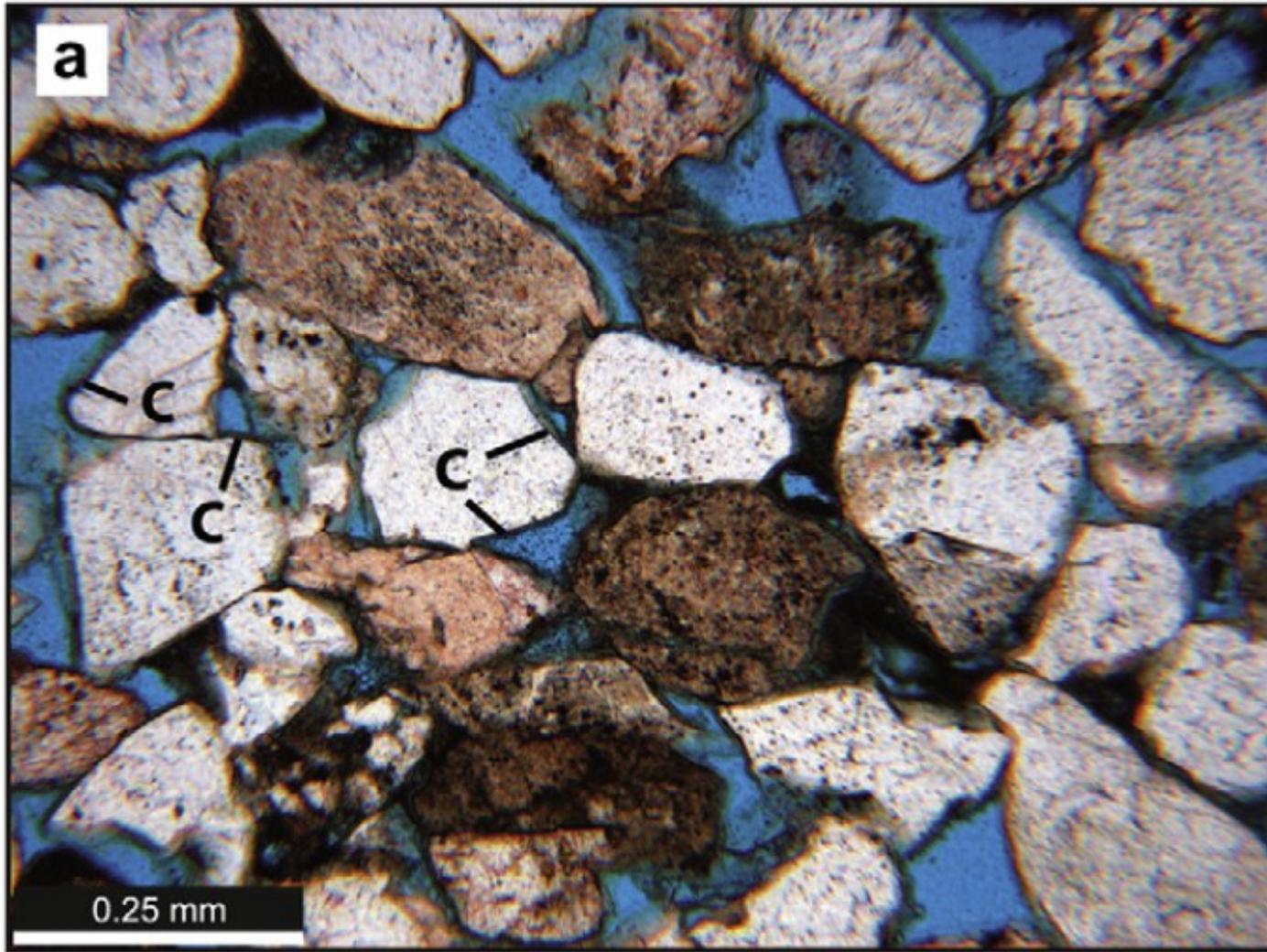
Area (number of wells with thin sections)	Sample depth (m)	Number of thin sections	Present framework grain composition (Quartz:Feldspar:Rock fragments)
Iberia Parish, Louisiana (1)	7163–7170	6	Q <sub>87</sub> F <sub>11</sub> R <sub>3</sub>
Vermilion Block 31, offshore Louisiana (2)	4356–4545	27	Q <sub>85</sub> F <sub>13</sub> R <sub>2</sub>
Upper Texas (3)	3737–5061	11	Q <sub>67</sub> F <sub>23</sub> R <sub>10</sub>
Lower Texas (3)	4187–4613	21	Q <sub>54</sub> F <sub>22</sub> R <sub>24</sub>
Burgos Basin onshore, Mexico (3)	2469–3006	11	Q <sub>54</sub> F <sub>22</sub> R <sub>23</sub>
Veracruz Basin, Mexico (5)	2311–3358	5	Q <sub>33</sub> F <sub>12</sub> R <sub>55</sub>



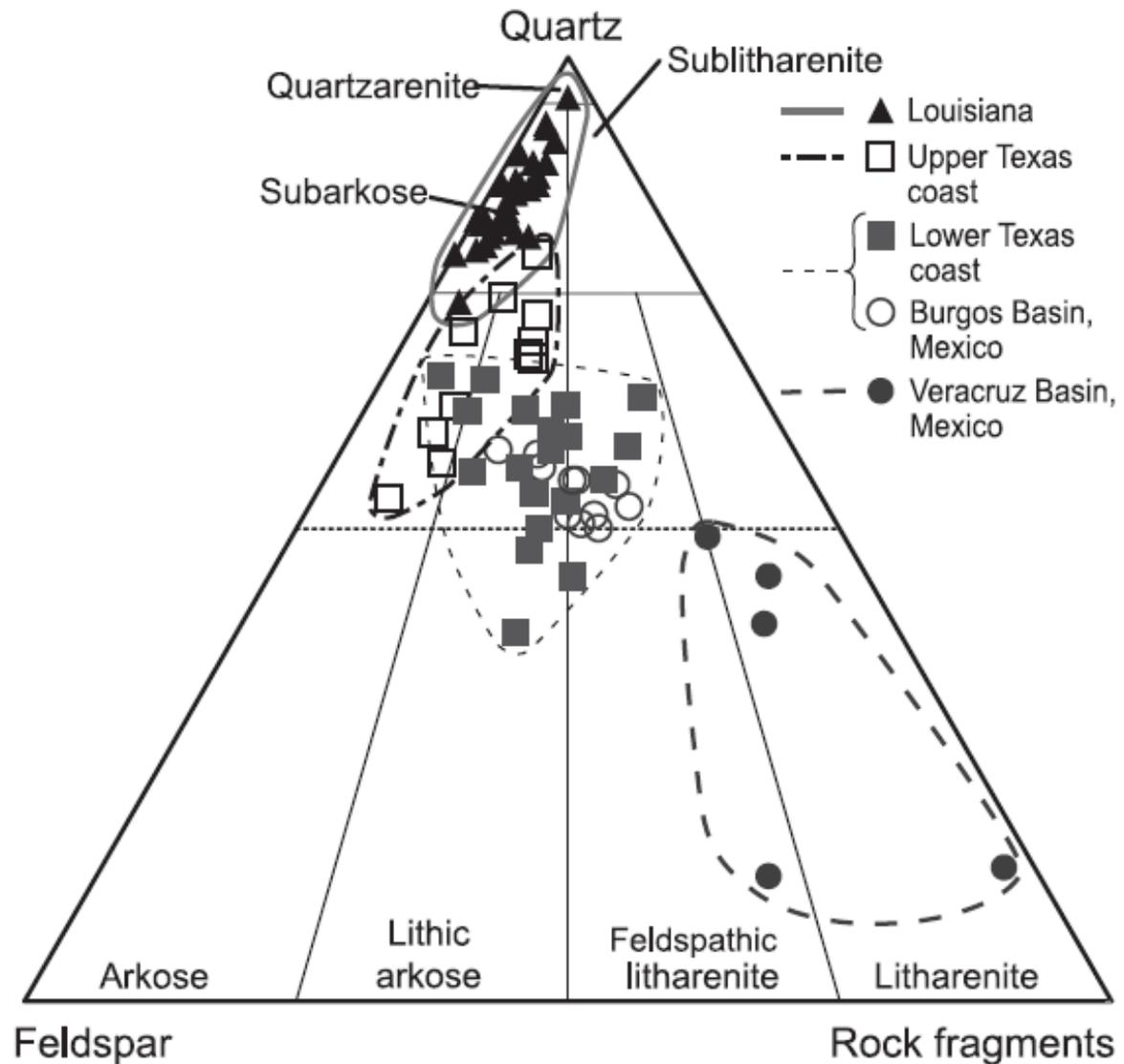
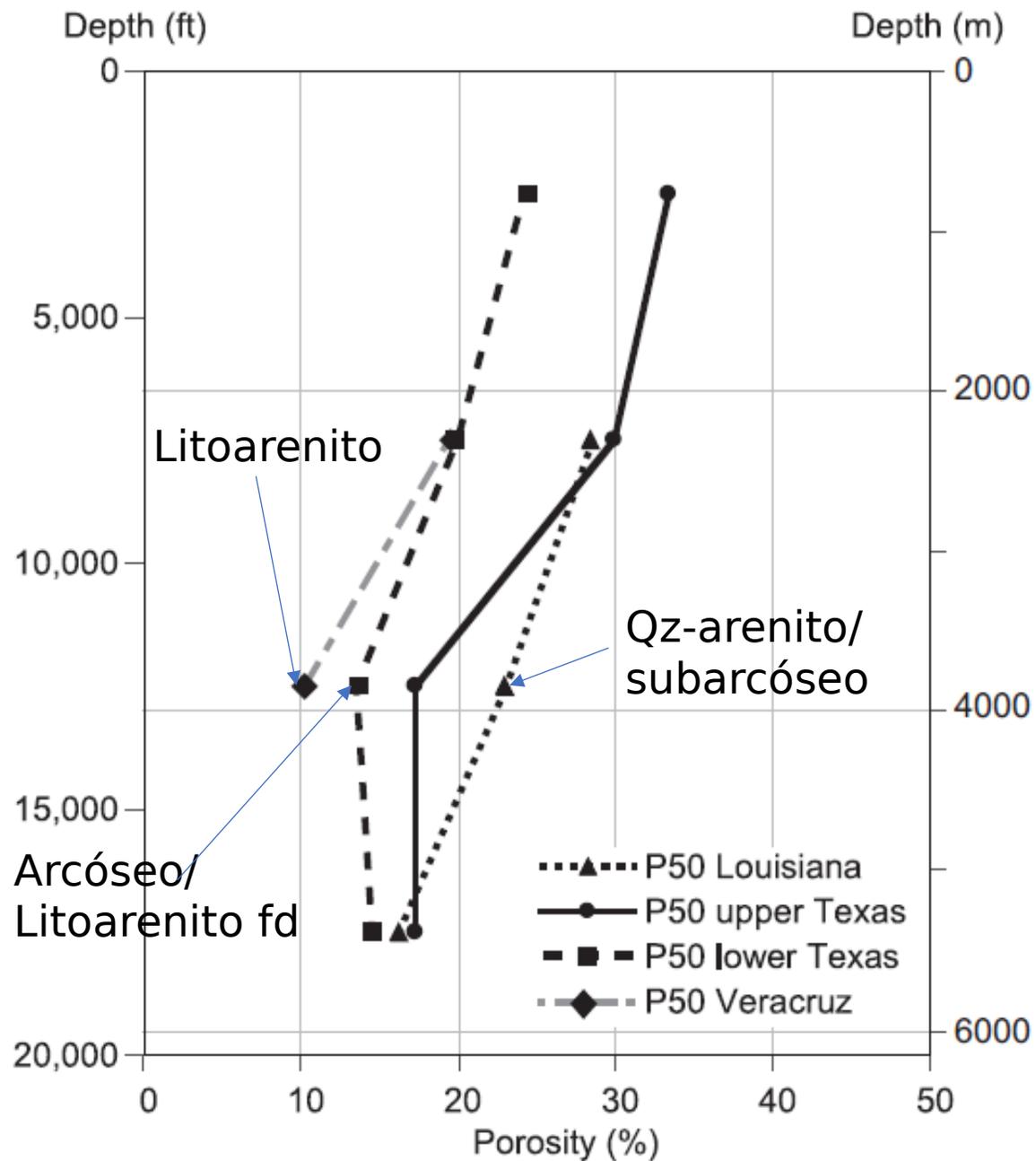








*Cimento de clorita inibiu cimentação por quartzo (prof.=4561.3 m)*



# Arenitos

- Classificação (arenito e wacke)
- Arcabouço, matriz, porosidade e cimento
- Eodiagênese, mesodiagênese e telodiagênese
- Proveniência