The Sara's Lust Migmatite: a transition zone between the Marowijne greenstone belt and Gran Rio granite

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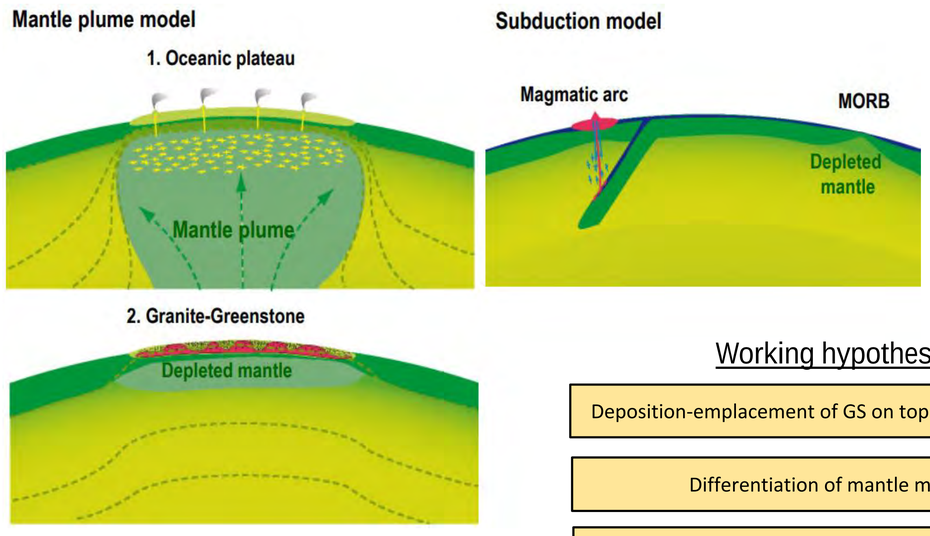
INTRODUCTION

Greenstone belts and granitoid-gneiss complexes are the key components of the Archean and Rhyacian. Despite numerous studies of these terranes the geodynamic context of the formation of these crustal segments is still debated. Authors debate between mantle plumes or plate tectonic regimes (Abouchami et al., 1990; Hill et al., 1992; Tomlinson & Condie, 2001; van Kranendonk et al., 2004; Baratoux et al., 2011). Part of the solution relies on the interpretation of the relationship between greenstone supracrustals and granitoid-gneiss complexes and on the significance of migmatitic gneisses, also designated as TTG gneisses, which form a significant part of the granitoid-gneiss complexes.

Geodynamic models

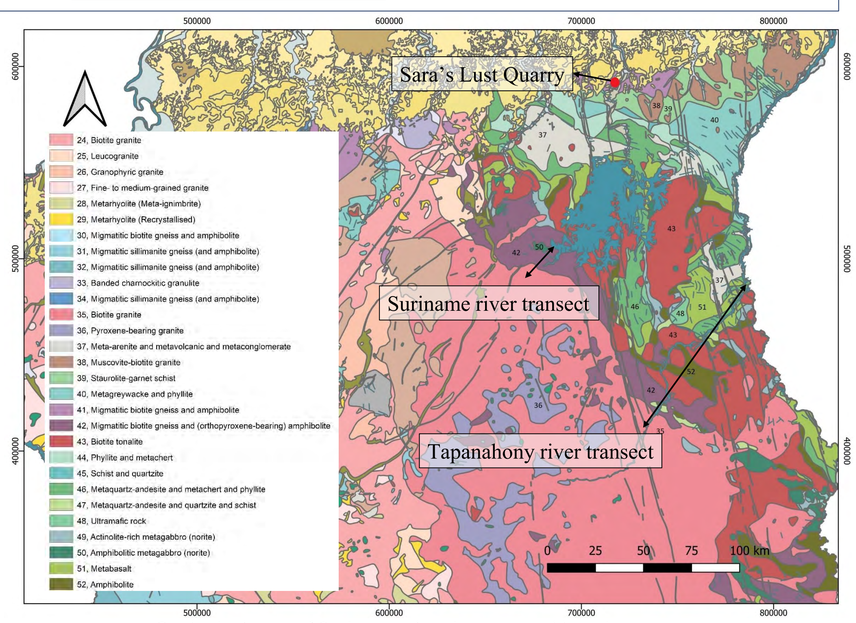


Working hypotheses

- Deposition-emplacement of GS on top of TTG basement
- Differentiation of mantle magmas
- Tectonically accreted terrane
- Metamorphic gradient and partial in-situ melt

GEOLOGIC SETTING

The Rhyacian rocks of northern Suriname, consists mainly of MGB that defines a regional-scale synclinorium, intruded by the Kabel TTG plutonic rocks and Patamacca two-mica granites, flanked by the Sara's Lust migmatite gneiss to the north and southwest and by the Gran Rio granite to the south



Geological map of Suriname showing mapped locations

METHODOLOGY

Strategy	Methods	Targeted Results
Nature of protoliths?	Field mapping and structural analysis	Sedimentary, magmatic, tectonic, metamorphic contact
	Metamorphic petrology/ thermobarometry	PTD conditions
	Geochemistry, major and trace elements	Geochemical affinities
Nature of contacts?	Geochronology/ isotopic tracing	Deposition age of sedimentary rocks
	Thermochronology	Crystallization age of magmatic rocks
		Age of metamorphism
		Cooling age

References

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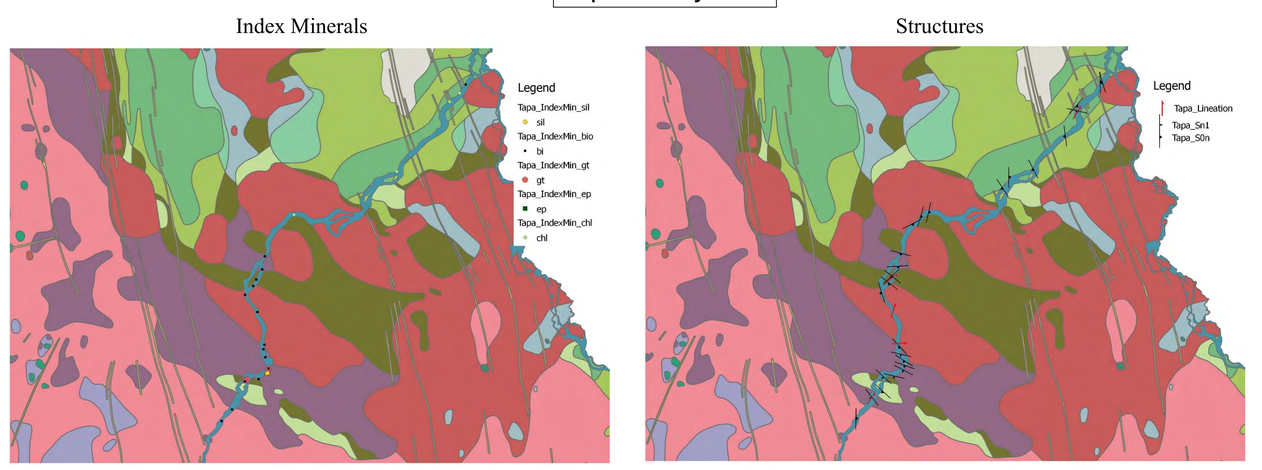
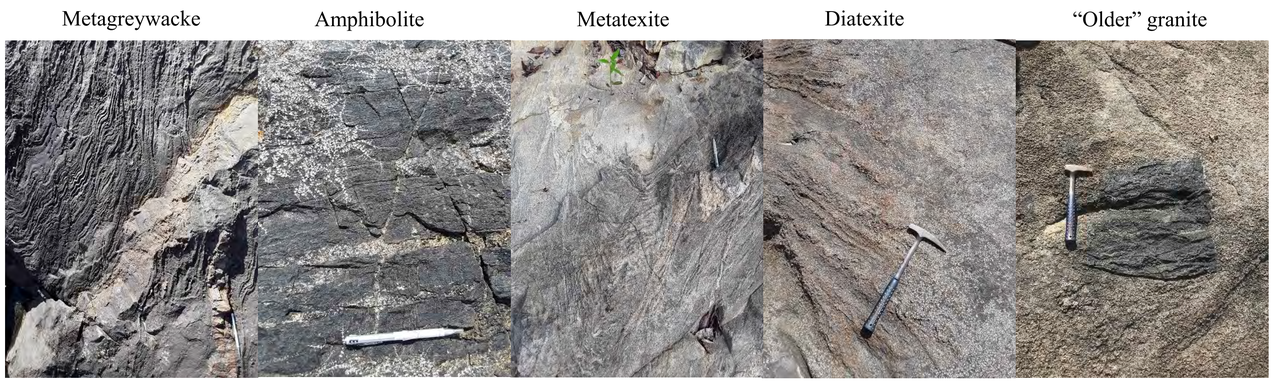
RESULTS

Field observations

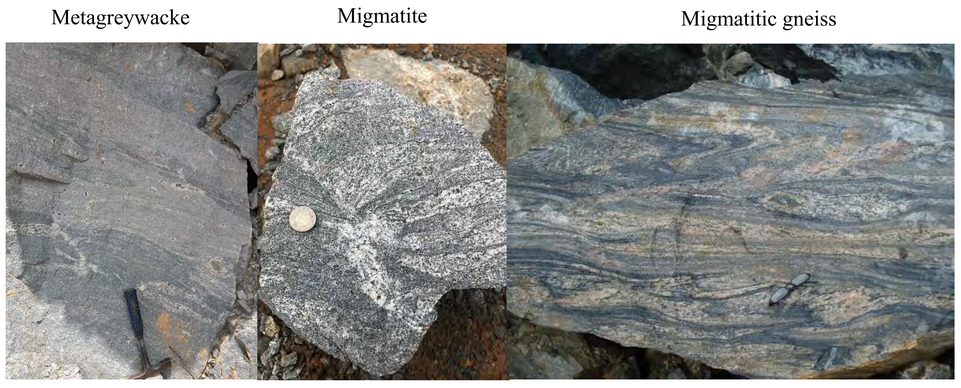
Tapanahony river





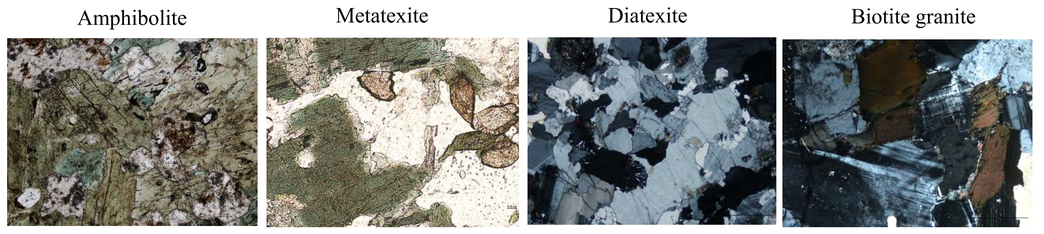
Suriname river

Sara's Lust Quarry



Petrography

Tapanahony river



CONCLUSIONS

- The contact between the MGB and the Gran Rio granitoid-gneiss is a domain of migmatites developed at the expense of amphibolites and metapelites-metagreywackes.
- The transition from the MGB to the Sara's Lust Gneiss (migmatitic complex) and subsequently diatexite (Gran Rio biotite granite) is gradual and may represent progressive metamorphic gradients (and structural depths).
- The leucosome bodies that are forming a texturally continuous network of concordant to discordant veins to the older syn (pre) migmatitic foliation indicates that further deformation occurred in the presence of melt and developed melt segregation.
- Partial melting likely post-dated the creation of greenstone sequences and occurred during progressive stages of the Transamazonian orogeny.