Autochthonous greenstone belts of Madagascar:
Implication for the archean tectonics in the frame of the
greater darwhar craton

Jean-Yves Roig, Delphine Bosch, Claude Delor

To cite this version:
Jean-Yves Roig, Delphine Bosch, Claude Delor. Autochthonous greenstone belts of Madagascar: Implication for the archean tectonics in the frame of the greater darwhar craton. IGCP 6148 SUPERCONTINENT CYCLES & GLOBAL GEODYNAMICS, Jun 2019, Antananarivo, Madagascar. hal-02080459

HAL Id: hal-02080459
https://hal-brgm.archives-ouvertes.fr/hal-02080459
Submitted on 26 Mar 2019

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.
The new geochronologic, petrologic and structural data acquired during the mapping project of the Programme de Gouvernance des Ressources Minérales de Madagascar, completed by academic works, lead to the re-definition of eight geological domains which make up the metamorphic Malagasy basement. The Center of the Island only consists of the Antananarivo and Antongil/Masora domain respectively. The Paleo-Mesoarchean Antongil/Masora domain (3.32-3.15 Ga) is interpreted as a fragment of the wider Dharwar craton of India. Its adjacent Neoarchean Antananarivo domain (2.7-2.5 Ga) is well know because it comprises a critical component of mafic-ultramafic gneisses which crop out as five N-striking belts interpreted as Archaean metamorphosed greenstone belts referred hereafter as “Tsaratanana Complex”.

In the conventional view, the Tsaratanana complex is interpreted as a single allochthonous unit thrust over granitoid gneisses of the Antananarivo block during the Panafriance orogeny. Two aspects of this notion are controversial: (i) the age of the allochthon’s emplacement and (ii) the very nature of the allochthon itself.

We present new structural data and U-Pb isotopic ages arguing that neither the structural evolution nor the age constraints of the identified geological events are consistent with an allochthonous model of nappe tectonics. On the contrary, the “Tsaratanana Complex” is likely an autochthonous domain or was juxtaposed with the Antananarivo Domain in the late Archean/Early Palaeoproterozoic times. In this way, the Antananarivo Domain and the associated “Tsaratanana Complex” does not differ from the Eastern Dharwar Craton. Consequently, the reliability of the “Betsimisaraka suture” is discussed and we propose that Neoarchean rocks of the Eastern Dharwar Craton and the Antananarivo domain were symmetrically disposed around the Mesoarchaean nucleus formed by the Western Dharwar Craton and the Antongil/masora Domain as earlier as Neoarchean times.