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► **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://brgm.hal.science/hal-02080459>

Submitted on 26 Mar 2019

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AUTOCHTHONOUS GREENSTONE BELTS OF MADAGASCAR: IMPLICATION FOR THE ARCHEAN TECTONICS IN THE FRAME OF THE GREATER DARWHAR CRATON

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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 Neoproterozoic Antananarivo domain (2.7-2.5 Ga) is well known 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 “Tsaratana Complex”.

In the conventional view, the Tsaratana complex is interpreted as a single allochthonous unit thrust over granitoid gneisses of the Antananarivo block during the Panafrican 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 “Tsaratana Complex” is likely an autochthonous domain or was juxtaposed with the Antananarivo Domain in the late Archaean / Early Palaeoproterozoic times. In this way, the Antananarivo Domain and the associated “Tsaratana Complex” does not differ from the Eastern Dharwar Craton. Consequently, the reliability of the “Betsimisaraka suture” is discussed and we propose that Neoproterozoic rocks of the Eastern Dharwar Craton and the Antananarivo domain were symmetrically disposed around the Mesoarchean nucleus formed by the Western Dharwar Craton and the Antongil/masora Domain as early as Neoproterozoic times.