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Evidence of Laurussian affinity for parts of the Mauritanides and Souttoufides (Moroccan Sahara)

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The Soutouffide belt is located in the southern part of the Moroccan Sahara. Representing the northern section of the Carboniferous Mauritanide belt, it extends from Morocco to Senegal. The Dhlou and Adrar Souttouf Massifs, both of which belong to the Souttoufide belt, are located on the western margin of the Archean Reguibat Shield. Previously, the Adrar Souttouf Massif has been suggested to be part of the Variscan Mauritanian-Appalachian system. To date the Moroccan Sahara has been one of the least studied regions in West Africa. This study presents new zircon ages from two units of the Adrar Souttouf Massif which have nevertheless allowed us to hypothesise a complex polyphased history. The Massif can be subdivided into four NNE-SSW trending units (listed here from east to west). The Sebkha Matallah unit represents the eastern margin of the Adrar Souttouf Massif and is thrust over the Ordovician to Devonian sedimentary Dhloat Ensour Group to the east. A central (Dayet Lawda) unit consisting of mafic and ultramafic rocks is interpreted as a possible remnant of Neoproterozoic oceanic crust or mafic terranes. The western Sebkha Gezmayet and Oued Togba units are mainly composed of granitoids and orthogneisses. Zircon ages of the Tonian-Stenian (1.4-1.0 Ga) were recorded in the Oued Togba and Sebkha Gezmayet units and suggest an Avalonian-Meguman-like relationship. Three other age groups were obtained in these two units: 610 to 570 Ma (Pan-African), 530 to 490 Ma (Cambrian), and 440 to 270 Ma. The latter population cannot result from Variscan orogeny alone, and is possibly linked to the Salinic and Acadian orogenies of Laurentia. Zircon age populations at $\sim$3.0 Ga and $\sim$2.65 Ga determined for two granite samples from the Archean foreland are in accordance to data already published. Ages of between 226 Ma (Upper Triassic) and 158 Ma (Upper Jurassic) result from lower intercepts of discordia lines and are interpreted as a Mesozoic thermal overprint of the area attributed to the break-up of Pangaea and the initial rifting of the Atlantic Ocean. The ages obtained support a new tectonic model describing the formation of the units of the Adrar Souttouf Massif.