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Mapping the Dyke Swarms of the Eglab-Yetti Region, Southwestern Algeria

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The Eglab-Yetti region of southwestern Algeria is a main part of the Reguibat shield of the West African craton (WAC) which consists of Archean to Paleoproterozoic basement. The region hosts numerous mafic dyke swarms which have previously been poorly characterized. Systematic use of various datasets such as full resolution Google Earth™ images, multispectral Landsat 8 Operational Land Imager (OLI) and ASTER (advanced spaceborne thermal emission and reflection radiometer) data and airborne magnetics data yield an initial map of the dyke swarms which are compiled in GIS environment.

Using Landsat spectral data combined with pole-reduced aeromagnetic data proved to be an efficient method for mapping, as the Eglab-Yetti is a semi arid region. The Mineral Index information provided by ASTER thermal data allowed as to distinguish felsic dykes from basic ones (Ninomiya et al., 2005). It is noted that the dykes occur in sub-parallel sets of a variety of trends (mainly N-S, NE-SW and E-W), which are inferred to represent separate swarms of likely distinct ages. The largest swarm (N-S trending) is up to 90 km long and 100 m wide. The thickness of individual dykes ranges from 15 m to more than 60 m, but there is tendency for each swarm to have a characteristic thickness. For instance, dykes of the N-S trending swarm, which are mainly doleritic and rarely amphibolitic, tend to have thicknesses of 40 m. Age constraints on some swarms are available from crosscutting relationships with host rocks of known ages. Also limited geochronology is available for these swarms, mainly K-Ar dating which has large uncertainties. On the basis of these sparse age constraints the following swarm ages are inferred: the N-S trending swarm is ca. 1.4 to 1.9 Ga (Aifa et al., 2001), the NE trending dykes are likely younger and E-W trending dykes are the youngest.

Large swarms are present in other parts of the WAC in

Algeria For instance, NE trending dykes and accompanying sills, outcrop in Tindouf and Regane and Bechar basins of Algeria. The average dyke thickness is 10 m wide but some dykes can reach 80 km long and 50 m wide such as Ksiksou dyke. These dykes and sills crosscut Paleozoic units and are related to the 200 Ma CAMP event (Chabou et al., 2007 and 2010).

As the Reguibat shield is considered to be a cratonic area then the N-S trending dyke swarm and perhaps NNE trending dykes may be the feeder system for Large Igneous Provinces. However, the smaller swarms as the NE and E-W trending ones may be linked to the tholeiitic to High K- calc-alkaline volcanic series of Eglab-Yetti (Tabeliouna et al., 2016) which are linked to Eburnean magmatism and/ or to a Pan-African continental margin extension event (also LIP related?) which also includes felsic dykes (Kahoui et al., 2008).

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