

# **The Pan-African arc-related volcanism of the Wadi Hodein area, South Eastern Desert, Egypt: Petrological and geochemical constraints**

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**Abstract-** The Wadi Hodein area contains a wide variety of late Precambrian igneous and metamorphic rocks, represented by gneisses, serpentinites, metagabbros, metasediments, metavolcanics, metagabbro-diorite, granodiorite and granitoids. The Wadi Hodein metavolcanics (WHV), including G. Khashab and G. El Anbat, represent one of the significant metavolcanic suites in the southern part of the Nubian Shield. They mainly belong to low-grade greenschist facies and range in composition from basalts to dacites. The basalts are mainly composed of plagioclase, augite, actinolite and hornblende together with minor quartz. Geochemically, the basalts have a transitional character from tholeiite to calc-alkaline. The basaltic andesite, andesite and dacite varieties are predominantly of calc-alkaline nature. The studied volcanics are enriched in LILE and depleted in HFSE, with a pronounced negative Nb anomaly. Thus, The WHV is most probably derived from a mantle source produced above a subducted slab of the lithosphere. Melting of such a hydrated mantle wedge produced a tholeiitic to calc-alkaline basaltic magma. The most basic basaltic sample has extremely low Mg# (54.3) and Ni (140 ppm) values, indicating that it has a significant fractionation of olivine and pyroxene. The investigated andesite and dacite might be formed, respectively, via fractional crystallization of basaltic andesite and andesite melts with about 41 % and 60 % removal of mostly hornblende and plagioclase.