

Mineral bearing alteration zones at gebel monqul area, north eastern desert, Egypt, using Remote Sensing and gamma ray spectrometry data

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Exploration of mineral resources is a challenge for the future of the economy and development in Egypt. However various geological metallogenic maps are available, many of such mineral resources are not well mapped and determined yet. The technology and the new techniques of earth observations developed to capture images of the earth can be functioned effectively to determine the alteration zones containing economic mineral resources as well as to define their exact location and spatial extension. Recently, remote sensing data have shown great potential in applications of various branches of geology. Since satellite sensors capture images with various spatial resolutions in many regions of the electromagnetic radiation (EMR), this can be widely used in geological applications. The main aim of this research study is to use the new techniques of remote sensing with both geophysical data and field studies to enhance the boundaries between the different lithological units and to delineate the alteration mineral zones to investigate and locate the potential areas for mineralization in the Gebel Monqul area. The integrated processed ASTER images and Gamma-Ray Spectrometry data analysis verified by the field geology helped in differentiating several alterations zones and the characteristic minerals from the hosted rocks. These alterations are confined to the volcanic and plutonic rocks depending on the lineament and fracture density among such rocks, in which the upcoming mineral-bearing hydrothermal solutions follow the rock fractures and lineament paths, leaving marks of alteration zones and mineral specifications in the altered rocks. Kaolinitization, sericitization, epidotization, and chloritization are the main types of alterations, developed by the action of the hydrothermal activity and the surrounding rocks. Lots of significant and related minerals are characterized by each type of alteration. These altered minerals are potentially associated with valuable minerals as sulphides and gold precipitations in the altered areas, which be suggested as valid localities for mineral exploration.

Biography

Mahmoud Abd El-Rahman is working in Department of Parasitology, Animal Health Research Institute, Dokki and Giza. Department of Parasitology, Faculty of Veterinary Medicine, Cairo University, Giza, Egypt. His international experience includes various programs, contributions and participation in different countries for diverse fields of study. Mahmoud Abd El-Rahman research interests reflect in his wide range of publications in various national and international journals.