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Floristic Diversity and Phytogeography of the Gebel Elba National Park, South-East Egypt

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Abstract: The floristic composition and phytogeographical analysis of the Gebel Elba National Park in the south-east corner of Egypt were studied using multivariate analysis techniques. Its flora was poorly documented; therefore, 5 recent expeditions between 1998 and 2004 were carried out, which resulted in the collection of 179 species that belong to 51 families. Six major wadis (sites) were investigated to cover adequately the territory of the Park (35,600 km2) and to attain as complete an inventory of its vascular flora as possible. The floristic composition and species diversity among the wadis showed variations in species richness, yet W. Yahameib was the most diversified. The most species-rich families were Compositae (12%), Leguminosae (9%), Gramineae (6.7%), Caryophyllaceae, Convolvulaceae and Euphorbiaceae (4.4% for each). This study revealed that the Gebel Elba Park is more diverse compared with other, well-studied phytogeographic territories in Egypt. Ninety-two species (51.4%) demonstrated a certain degree of consistency, where they were exclusively recorded in or confined to a certain wadi (site) or group of wadis. The life-form spectrum was dominated by therophytes, denoting a typical arid desert flora, while phanerophytes, chamaephytes and hemicryptophytes were of equal importance. The distribution of the phytogeographic elements in the distinguished life-form categories showed the prevalence of the Saharo-Arabian geoelement (48%), whereas the Sudano-Zambezian and Mediterranean geoelements ranked second, with 19.6% and 14 %, respectively. Therefore, the Gebel Elba Park represents a continuation of the Sudanian tropical region, which still needs further intensive study. A very special study undertaken to examine the diversity-altitude relationships along an altitudinal gradient in W. Yahameib revealed that the highest diversity occurred at middle altitudes on the mountain, which may be more typical of arid mountains in desert regions.

Key Words: Altitudinal zonation, Arid coastal mountain, Biogeography, Distribution patterns, Floristic richness, Egypt, Multivariate analysis

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