Integrated Plant Record (IPR) Vegetation Analysis applied to modern vegetation in

South China and Japan

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ABSTRACT

Integrated Plant Record (IPR) vegetation analysis is a semi-quantitative tool developed as a proxy to assess zonal vegetation classification. It is based on fossil plant taxa categorized into zonal taxonomic-physiognomic components reflecting key autecological characteristics. The proportions of these components in the fossil assemblages define the main vegetation types. Modern vegetation studies in areas of southeastern China (Mount Emei, Mount Longqi, Meili Snow Mountains) and in Japan (Shirakami Sanchi, Mount Fuji, Nara, Yokohama, Yakushima Island) are performed here to test this fossil-based technique and achieve fine-tuning and corroboration. Thirty-five units of different vegetation types generally defined as broad-leaved evergreen forests, mixed mesophytic forests, broad-leaved deciduous forests, and subhumid sclerophyllous forests were investigated. IPR vegetation analysis results obtained from this modern vegetation largely support the originally defined proportions of the important zonal woody angiosperm groups, i.e., broad-leaved deciduous, broad-leaved evergreen, sclerophyllous, and legume-type components, and cluster analysis also confirms these results. Nonetheless, the data suggest that the new definition of ecotones and adaption of the threshold value of the broad-leaved evergreen component for the definition of broad-leaved evergreen forests are necessary. The results of this study of modern vegetation reveal a distinct underrepresentation of zonal herbs in the fossil record, regardless of whether dealing with leaf, pollen, or fruit assemblages. The vegetation scheme based on IPR vegetation analysis is therefore extended to properly reflect the zonal herb diversity present in modern vegetation. The results also confirm a higher diversity of zonal herbs in modern broad-leaved deciduous versus broad-leaved evergreen forests, as observed in the Neogene European record.