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Valanginian paleoenvironmental changes in the Southern Carpathians (Romania)

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The changes in nannofossil diversity and abundance, together with the fluctuation in the organic matter and CaCO3 content, recorded in the Southern Carpathian region, indicated significant paleoenvironmental changes during the Valanginian. Qualitative and semiquantitative investigations were achieved on calcareous nannoplankton, one of the most sensitive marine organisms to environmental changes. The semiquantitative studies focussed on several taxonomic groups, such as Watznaueria barnesae, the Tethyan Nannoconus species, the pentalith group (e.g., the Micrantholithus and Braarudosphaera genera), Diazomatolithus lehmanii, Zeugrhabdotus erectus, Biscutum constans, and Discorhabdus rotatorius. The identified nannofloras were assigned to the NK3A, NK3B and NC4A calcareous nannofossil Zones. The nannoconid dominance in the nannofloral assemblages, together with a low abundance of fertility proxies, indicates oligotrophic conditions for earliest Valanginian times. Within the late Early Valanginian, the significant drop of the Nannoconus spp., accompanied by the increase of the nannofossils Zeugrhabdotus erectus, Diazomatolithus lehmanii, Discorhabdus rotatorius and Biscutum constans, argue for a shift from oligotrophic conditions to eutrophic ones. A similar setting could be assumed for the early Late Valanginian interval (within the Verrucosum ammonite Zone). A recovery of the nannoconid abundance, associated with a decrease of the fertility proxies indicate the restoration of the oligotrophic conditions at surface waters, during a short Late Valanginian interval (top of the Verrucosum ammonite Zone and during most of the Peregrinus ammonite Zones). In the latest Valanginian (from the top of the Peregrinus ammonite Zone, and including the whole Furcillata ammonite Zone), an abrupt nan-

noconid decrease was observed, together with higher abundance of Watznaueria barnesae, while the high fertility proxies significantly increased. Our data indicate a new palaeoenvironmental changes towards the top of the Valanginian, shifting to at least a mesotrophic setting. In the whole studied interval, the CaCO3 show a similar trend as indicated by the fluctuation in abundance of the highly calcified nannoconids. We may assume that the diminishing of CaCO3 content, towards the top of the Valanginian, accompanied by the significant decrease of the nannoconid abundance and increase of high fertility proxies mirror the instability of the ocean/atmosphere system, reflected in shift of the phytoplankton community, as well as in the geochemistry of the surface waters. The latest Valanginian palaeoenvironmental changes are coeval, in the Southern Carpathians, with the initiation of the carbonate platform drowning.