604 - THE IMPORTANCE OF SCALE EFFECT IN GROUNDWATER RELATED VEGETATION PATTERN OF GREAT HUNGARIAN PLAIN

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Groundwater being as a geologic agent (Tóth, 1999) has an important role in controlling vegetation distribution. The connection between ecosystems, vegetation and groundwater has been already investigated from several points of view (Hancock et al., 2005; Boulton et al., 2010, Bertrand et al., 2011). The present study aims at the understanding how the flow systems with different origin and different order of magnitude influence the complex vegetation pattern in a sedimentary basin. The study intends to highlight the importance of scale-effect in the investigation of ecosystems.

The study area is located in the Great Hungarian Plain, Pannonian Basin. Two main flow systems was delineated for the area, an overpressured regime overlain by a gravity driven flow system. On the surface two main vegetation types are prevalent: saline and fresh water type ecosystems. The connection between groundwater and vegetation was investigated at regional and local scale. As a first step regional scale hydrogeological flow systems characterization (Mádl-Szőnyi and Tóth, 2009) and vegetational mapping was done (Biró et al., 2003). The results of the hydraulic and chemical data analysis were compared with the vegetation pattern. The regional scale flow distribution highly coincides with the vegetation pattern. However, in local scale the situation is more complex. The explanation of mosaic-type vegetation pattern in the discharge areas was possible only in aware of the results of hydraulic flow system analysis both at regional and local scales. The appearance of mosaic-like saline and fresh water type vegetation can be interpreted as the result of the joint effect of the overpressured deep flow and the superimposed gravity driven local and regional scale flow systems all together. Investigation of flow systems at different scales was necessary to give a sufficient explanation on the complex vegetation pattern in the different flow regime areas.

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