Geophysical Research Abstracts, Vol. 8, 06751, 2006
SRef-ID: 1607-7962/gra/EGU06-A-06751

HYPORHEIC SEDIMENTS AS REFUGIAL ZONE FOR BENTHIC INVERTEBRATES.

SPATIO-TEMPORAL ASPECTS, CONTRIBUTION OF HYDROLOGICAL SCIENCES.

M-J DOLE-OLIVIER

UMR CNRS 5023, Ecologie des Hydrosystèmes Fluviaux, Equipe Hydrobiologie et Ecologie Souterraines, Université Claude Bernard Lyon 1, Bât. Forel, 43 Boulevard du 11 Novembre 1918, F-69622 Cedex, France.

mjdole@biomserv.univ-lyon1.fr

INCREASE IN SEDIMENT COLMATION AND IN CLOGGING INTENSITY IS CURRENTLY OBSERVED IN RELATION TO HUMAN ACTIVITIES. IT MAY ALTER HYDROLOGICAL AND BIOLOGICAL EXCHANGES THROUGH THE HYPORHEIC ZONE AND ESPECIALLY MODIFY THE ABILITY OF HYPORHEIC INTERSTICES TO PROVIDE REFUGIAL SPACE FOR BENTHIC INVERTEBRATES.

The use of sediment interstices by benthic invertebrates as a refuge during disturbance periods and role of the hyporheic zone in resilience processes are not genuinely demonstrated. In consideration since the seventies ("hyporheic refuge hypothesis", Clifford 1966, Williams & Hynes 1974), the question remains still unsolved with divergent results (e.g., Palmer *et al*., 1991 vs Dole-Olivier *et al*, 1996). Why such a long time devoted to such an apparently simple question?

By synthesizing the current knowledge and available data on this topic, this work splits the question into its descriptive and quantitative aspects, points out the relation with environmental heterogeneity (hydrological patterns) and tackles the effect of scales. It also evidenciates gaps in knowledge and proposes several working hypotheses to set future research into a common framework.

Final target is to emphasize and develop research towards a streams methodology

to assess the quality of alluvial sediments, not only in terms of anthropisation but also in terms of intensity of exchanges with surface stream and ability to ensure life and rapid recovery after stress periods. In the situation of global climate change, that will modify the frequency of extreme hydrological events, critical periods for stream organisms would also increase both in intensity and duration. Within this context, it is of paramount importance to provide tools for identifying and delineating “functional zones” along stream corridors, being of great interest for the overall stream life. In this approach, ecologists strongly need to combine skills originated from researchers in geosciences such as geomorphology, hydrogeology and hydraulics.