462 - DISTRIBUTION AND INTERACTION BETWEEN SELECTED PHARMATEUTICALS AND HYDROGEOCHEMISTRY IN GUADALHORCE AQUIFER (SOUTH OF SPAIN)

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Management of water resources implies the study of their quality and in recent times one of the main drawbacks is the presence of non-regulated products, the so-called "Emerging Contaminants (EC)". Currently the study of these contaminants is among the research priorities of the main organizations dedicated to the protection of public and environmental, such as OMS, EPA or the EU Commission health. The list of emerging contaminants include a wide variety of products both industrial and domestic applications, whose harmful effects include toxicity, bioaccumulation, and even endocrine disruption. Conventional wastewater treatment technologies are not efficient at removing many of these contaminants, so effluents and reuse become one of the most significant sources of contamination, even many emerging pollutants are only partially degraded and are even more toxic byproducts than the parent compounds.

This research is focused in the Guadalhorce porous aquifer (Malaga, south of Spain), to study the distribution of EC and the interaction with the hydrogeochemistry. 14 EC (*Ibuprofen, Hydrochlorothiazide, Salicilic Acid, Triclosan, Menfenamic Acid, Carbamazepine, Trimethoprim, Ofloxacin, Cafeine, Metotrexato, Metronidazole, Sulfadiazine, Sulfamethazine and Sulfamethoxazole*) and 36 paramaters including electrical conductivity, T, pH, DO, major ions (Cl-, SO42-, HCO3-, NO3-, Ca2+, Mg2+, Na+, K+), metals (B, Al, Fe, Mn, Cd, Pb, Zn, As and Se) and isotopes (d2H-H2O, d18O-H2O, d34S-SO42-) were controlled in a single field sampling (June 2012). Relationships between certain pollutants by its focus of origin are studied. Ibuprofen and Menfenamic acid follow the same pattern since they have the same use as anti-inflammatory agents and origin, mainly related to urban centers, which is important in the Guadalhorce area close to the mouth. Some possible explanations are the close situation of the Waste Water Treatment Plant of Malaga, numerous discharges of wastewater, irrigations with reused and non-reused water, among others. Nearby to the upper part of the aquifer, where farms and livestock are concentrated, pharmaceuticals for veterinary use are frequent. Furthermore, a relationship between certain emerging contaminants and hydrogeochemical characteristics present in the groundwater masses is observed, noting that ibuprofen, for example, has an indirect correlation to the temperature and concentration of certain ions such as chlorine and lead present in water masses. So it may be said that the distribution and concentration of emerging contaminants is not only affected by the number of pollution sources but also by the hydrogeochemical characteristics of the aquifer.