

Information content means the amount of all information on the environment saved in biological specimens. Its decoding is essential to use biological systems in the context of environmental assessment. The German Environmental Banking Programme (ESB) as the most developed part of the German integrated environmental assessment provides reliable information on the environmental state in terms of chemical concentrations but is not able to indicate the relevance of chemical substances for biological systems. Therefore, essential prerequisites are missing to assess the environmental state in a comprehensive scientific way. Correspondingly, the primary objective of this study is, to develop a concept decoding comprehensively the information content on the environmental state saved in animal organisms. An essential prerequisite is a methodical approach based on standardizing that defines the quality of environmental samples. To indicate effects of chemical substances on biological systems the biomarker concept as a relatively new scientific approach is discussed using four relevant and sensible biological systems: cytochrome P-450 monooxygenase system, endocrine sexual system, genetic system, and immune system. Efficiency and deficiency of these systems are discussed in terms of their use in environmental assessment. In conclusion, environmental specimen banking is a useful tool to store specimens for deferred analyses of effects from chemical substances with improved methods by using the biomarker concept.