

Purpose and research

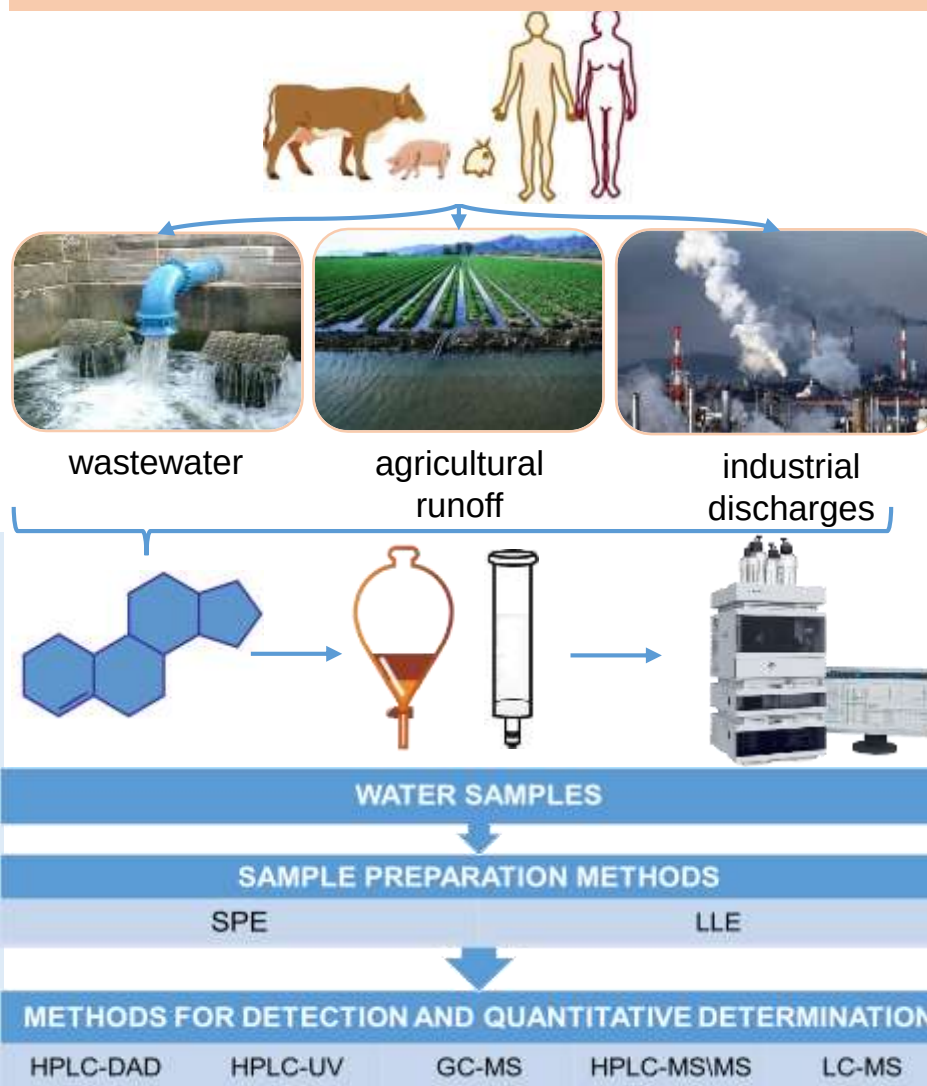
Purpose. A review of current scientific data on steroid compounds as environmental pollutants, analytical methods for their detection and quantification, and the selection of reliable techniques for studying steroid hormone residues in the environment

Research. To analyze the methods for detection and quantitative determination of steroid compounds in aquatic environments.

Materials and methods

Information and analytical research methods, regulatory documents governing water quality requirements, and international scientific databases – Scopus (Environmental Science and Pollution Research), Web of Science (Microchemical Journal, Environmental Research), PubMed (Environmental Monitoring and Assessment, The Journal of Steroid Biochemistry and Molecular Biology), and Google Scholar (Chemistry Central Journal)

Pathways of entry and detection of steroid hormones in the ecosystem.



Results

The main sample preparation methods include liquid–liquid extraction, solid-phase extraction, and solid-phase microextraction, which reduce solvent consumption and enhance the sensitivity and selectivity of analysis. For the detection and quantitative determination of steroid hormones, highly sensitive and reproducible analytical techniques are employed, such as high-performance liquid chromatography with diode-array detection, high-performance liquid chromatography coupled with mass spectrometry and electrospray ionization, and gas chromatography–mass spectrometry

Conclusion

Pharmaceutical compounds, as micro-pollutants, pose a significant threat of environmental contamination. Conventional water treatment methods do not always ensure the complete removal of steroid hormones. According to the literature, high-performance liquid chromatography coupled with mass spectrometry (HPLC–MS) demonstrates the highest sensitivity, selectivity and reproducibility for the analysis of steroid compounds.