In recent years, the pollution and bioaccumulation of halogenated flame retardant (HFRs) has been one of the hot issues in the study of biogeochemistry. In addition to tetrabromobisphenol A (TBBPA), polybrominated diphenyl ethers (PBDEs), and hexabromocyclododecanes (HBCDs) as the three traditional brominated flame retardant, the environmental chemical behaviors of some new alternatives such as decabromodiphenyl ethane (DBDPE) and dechlorane Plus (DPs) have also been paid more attention to. Although the distribution and bioaccumulation of PBDEs, TBBPA and HBCDs in the environment has been widely reported, the mechanism for the differences in bioaccumulation on PBDEs and HBCDs is not clear. Further study is also warranted for the studying differences in bioaccumulation between terrestrial ecosystem and aquatic ecosystem.

In the present study, we selected the aquatic environment of the Dongjiang River Delta and the E-waste recycling site as our studying areas. We collected surface sediments, sediment cores, water and fish species in the Dongjiang River and birds with different feeding habits, their food and environmental matrix in the E-waste recycling site to analyze the contamination levels of PBDEs, DBDPE, DP, TBBPA and HBCDs in the Dongjiang River and TBBPA and HBCDs in the E-waste recycling site. The spatial and temporal distributions, the partition between particle and dissolved phases in water and the bioaccumulation differences in aquatic organisms in the aquatic environment in Dongjiang River have been discussed. We also investigated the influences of environmental matrix and food source on the different bioaccumulation in various species of HBCDs stereoisomers and enantiomers both in aquatic and terrestrial environment and its influencing factors.