

Can heart tissue fatty acid profile be used as a tool to discriminate sea lamprey (*Petromyzon marinus*, L.) populations in several Portuguese river basins?

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This study proposes to evaluate the use of heart tissue fatty acid signature and multivariate analysis of fatty acid profile as a possible discriminating tool for sea lamprey *P. marinus* populations sampled in Portuguese river basins. Local fisherman collected adult sea lampreys in eight Portuguese river basins (Minho, Lima, Cávado, Douro, Vouga, Mondego, Tagus and Guadiana) at the beginning of their spawning migration. Heart total lipid extraction was obtained by accelerated solvent extraction (ASE) and FAMES were prepared by transesterification with methanol-boron trifluoride and analysed by GC. FAMES were identified by comparison of their retention times with known standards chromatographed in identical gas chromatography conditions. The fatty acid profile of the heart tissue varied among the individuals of the different river basins. In order to identify which fatty acid contributed most to the differences between river basins heart tissue, MDA was employed. The MDA proved to be statistically significant and the overall corrected classification rate estimated from cross-validation procedure was 86.2%. Although in the case of the individuals of Tagus and Guadiana 100% and 94.7 % of subjects were correctly classified, respectively, there are always a few individuals of the other 5 watersheds that have characteristics identical to those observed in these two river basins. The results are discussed in terms of fatty acid origin and hypothesis concerning the migratory behavior that could lead to these results. The fatty acid profile of heart is considered more stable than other organs, but it still exhibits some variability. This study seems to point out the potential for fatty acid compositions to discriminate sea lampreys from Portuguese river basins,

which are probably related with environmental variables that they may have been exposed during early stages of their life cycle.