## Comparison of fish fauna between two seasons around Tsushima Island using environmental DNA metabarcoding

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Tsushima Island is located between Kyushu Island of Japan and Korean Peninsula in the Sea of Japan. Tsushima City has tried to establish Marine Protected Areas (MPAs) around Tsushima Island for sustainable use of ecosystem services. In that case, current information for marine ecosystem is indispensable, whereas an intensive investigation is not carried out in the area and there is no comprehensive data for current fish fauna. Environmental DNA (eDNA) metabarcoding can quickly reveal the current ecosystem by filtrating waters and analyzing the huge data. Thus, this study applied the eDNA metabarcoding for fish fauna monitoring in order to elucidate the coastal ecosystem around Tsushima Island, and the geographical, temporal changes of them. We set voluntary six areas that cover the whole coastal area of the Island: that is, NN, WN, EN, SS, WS, and ES. eDNA samples were collected in each area on October and December 2016. 184 OUTs of fishes inhibited in coastal area were identified by MiSeq sequencing and assignment. Non Metric Multidimensional Scaling and Hierarchical clustering analysis were conducted using dataset that have only existence/absence information. There were geographical differences among areas, and each area had similar fish fauna on October and December except for EN and SS. Especially SS had different species component during sampling period, therefore, some environmental factors shifting with season should be affected to the coastal ecosystem. Further sampling and analysis are recommended to clarify the geographical and seasonal change of coastal ecosystem around Tsushima Island to establish the appropriate MPAs.

**Keywords:** environmental DNA, metabarcoding, fish fauna, monitoring, MPAs

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