**Table S1.** eDNA studies with an intraspecific genetic diversity approach. As few studies are available, we also keep non-coastal marine studies to reveal the potential of eDNA for population genetic application. Completed from Table 1 of Sigsgaard et al. (2020).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Reference** | **Target taxon/taxa** | **Environment**  | **Variant detection approach** | **Target gene(s)/region(s)** | **Length of marker(s) (bp)** |
| Uchii et al., 2016 | *Cyprinus carpio* (common carp) | Freshwater | qPCR | D-loop | 240 |
| Sigsgaard et al., 2016 | *Rhincodon typus* (whale shark) | Marine | Species-level metabarcoding | D-loop | 412-493 |
| Stat et al., 2017 | Fishes | Marine | Multispecies metabarcoding | 16S rRNA | 178-228 |
| Gorički et al., 2017 | *Proteus anguinus* (olm) | Freshwater | qPCR | D-loop, cytochrome b,and 16S rRNA | 106-157 |
| Baker et al., 2018 | *Orcinus orca (killer whale)* | Marine | ddPCR | D-loop | 139-249 |
| Parsons et al., 2018 | *Phocoena phocoena* (harbour porpoise) | Marine | Species-level metabarcoding | Cytochrome b | 160 |
| Marshall & Stepien, 2019 | *Dreissena polymorpha and D. rostriformis* (Eurasian zebra and quagga mussels) | Freshwater | Multispecies metabarcoding | Cytochrome oxidase I | 169-175 |
| Stepien et al., 2019 | *Hypophthalmichthys molitrix* (silver carp) | Freshwater | Multispecies metabarcoding | Cytochrome b | 135 |
| Turon et al., 2020 | Eukaryotes | Marine | Multispecies metabarcoding | Cytochrome oxidase I | 313 |
| Shum & Palumbi, 2021 | metazoan phyla and algae | Marine | Multispecies metabarcoding | Cytochrome oxidase I | 313 |
| Székely et al., 2021 | *Balaena mysticetus* (bowhead whale) | Marine | Species-level metabarcoding + shotgun sequencing | mtDNA control region | 519 |
| Jensen et al., 2021 | *Rhincodon typus* (whale shark) | Marine | Target capture | mtDNA, nuclear DNA | 29-1000 SNPs |
| Andres et al., 2021 | Neogobius melanostomus (round goby) | Marine | multiplex PCR | Microsatellite | 410-440 |
| Dugal et al., 2022 | *Rhincodon typus* (whale shark) | Marine | Species-level metabarcoding | D-loop | 412 |
| Farrell et al., 2022 | *Chelonia mydas* and *Caretta caretta* (green and loggerhead sea turtle) | Marine | qPCR + shotgun sequencing | 16S rRNA | 499-561 |
| Macé et al., 2022 | *Mullus surmuletus* (striped red mullet) | Marine | Species-level metabarcoding | D-loop | 259 |

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