SELEZIONE N. 2023T17, PER TITOLI ED ESAMI, AL FINE DI REPERIRE N. 1 TECNOLOGO DI RICERCA, DI SECONDO LIVELLO (CATEGORIA STIPENDIALE PARI A "D3"), DA ASSUMERE MEDIANTE CONTRATTO DI LAVORO A TERMINE, A TEMPO PIENO, PER N. 60 MESI, AI SENSI DELL'ART. 24-BIS DELLA LEGGE 30.12.2010, N. 240, E DEL C.C.N.L. DEL 19.04.2018, IN QUANTO COMPATIBILE, PRESSO IL DIPARTIMENTO DI BIOLOGIA - DIBIO.

QUESITI COLLOQUIO

Prova 1

1. Estrazione del DINA da organismi marini. Generalità e accorgimenti specifici.
2. Costruzione di librerie per RAD sequencing. Aspetti generali e problematiche in organismi marini.
3. Informatica: Quali software utilizzerebbe per un'analisi di dati di sequenze mitocondriali in genetica di popolazione di organismi marini e lagunari.

Prova inglese
Marine biodiversity is a key indicator of ecosystem health and can be assessed using a variety of methods, including environmental DNA (eDNA) sampling. However, the ecology of eDNA in physically dynamic nearshore environments remains uncertain, particularly with regards to how eDNA stratifies with depth. Here, we paired eDNA sampling with dive surveys at six sites in Knight Inlet, British Columbia, Canada. eDNA samples were collected from the surface, midwater column and bottom (8-25 m depth) at each site, while dive surveys focused on the bottom (benthic) habitat. Amplicon sequencing using the mitochondrial 12S rRNA gene (targeting fish) and the COI gene (targeting marine invertebrates and algae) resolved significant differences in community composition in surface waters compared with midwater and bottom.

Prova 2

1. PCR da DNA di organismi marini. Quali problemi particolari si aspetta?
2. Approcci sperimentali per l'analisi di espressione multilocus in organismi marini.
3. Informatica: Che softwares utilizzerebbe per un'analisi di demografia storica in organismi marini.

Prova inglese
Environmental DNA is a powerful tool for community science-based biodiversity surveys. However, the effectiveness of environmental DNA for environmental education and the time and physical costs perceived by volunteers for collecting environmental DNA remain unclear. Here, we evaluated a community science program for monitoring marine fish biodiversity using environmental DNA metabarcoding. This program aimed to investigate marine fish biodiversity in coastal areas along the Japanese archipelago. The participants were allowed to decide on the date and site to collect environmental DNA. They received a paper manual, a data sheet, and a sampling kit via a parcel delivery service. Before collecting environmental DNA, they watched a video manual for collecting environmental DNA and attended a webinar about the process and precautions for collecting environmental DNA provided by the scientists.

Prova 3

1. Prelievo e conservazione di campioni di organismi marini per successive analisi di ecologia molecolare. Protocolli ed accorgimenti specifici.
2. Preparazione di campioni per sequenziamento genomico in organismi marini.
3. Informatica: Che software utilizzerebbe per lo scoring e l'analisi di marcatori microsatellite in popolazioni marine.

Prova inglese

Extra-organismal DNA (eoDNA) from material left behind by organisms (noninvasive DNA, e.g., feces, hair) or from environmental samples (eDNA, e.g., water, soil) is a valuable source of genetic information. However, the relatively low quality and quantity of eoDNA, which can be further degraded by environmental factors, results in reduced amplification and sequencing success. This is often compensated for through cost- and time-intensive replications of genotyping/sequencing procedures. Therefore, systemand site-specific quantifications of environmental degradation are needed to maximize sampling efficiency (e.g., fewer replicates, shorter sampling durations), and to improve species detection and abundance estimates. Using 10 environmentally diverse bat roosts as a case study, we developed a robust modeling pipeline to quantify the environmental factors degrading eoDNA, predict eoDNA quality, and estimate sampling-site-specific ideal exposure duration.