**Checklist of methods and result reporting**

Checklist of information for conducting and reporting environmental microplastics research, adapted from Cowger et al. (2020).

\* indicates compulsory items to be reported.

|  |  |  |
| --- | --- | --- |
| **Reported (✓)**  | **Action Item** | **Define the action or information determined by you and your research team** *(some examples provided)* |
| **General considerations** |
|  | \* Has the research question been defined |  |
|  | \* Which field manual will you follow? |  |
|  | Are there any existing standard protocols suitable to investigate your research question? |  |
| **Selection of a sampling design** |
|  | Sampling effort required (e.g., power analysis) |  |
|  | \* Location |  |
|  | \* Number of samples to collect per location |  |
|  | \* Number of replicates |  |
|  | Is my sampling design representative of the habitat/compartment that I wish to answer a research question about? |  |
|  | Randomised sampling? |  |
| **Materials & Equipment used** |
|  | Devices/equipment & manufacturers |  |
|  | Software |  |
|  | How were the devices and software calibrated |  |
| **Quality Assurance & Quality Control** |
|  | Defined controls and replication (e.g., field blanks, procedural blanks, airborne contamination control, positive controls, recovery tests) |  |
|  | Defined and clear limit of detection (e.g., microplastic size constraints) |  |
|  | \* Actions taken for contamination mitigation |  |
|  | Control correction procedure/s on the environmental data |  |
|  | Laboratory and equipment cleaning procedures |  |
|  | Reagent purification methods |  |
| **Field Sampling** |
|  | \* Record of field location (including GPS coordinates), sampling date, and time |  |
|  | Records of additional environmental conditions where applicable (e.g., air temperature, wind, tides, water temperature, pH, and salinity) |  |
|  | Surface area or volume of sample collected from environmental matrices, with appropriate units |  |
|  | \* Composition of the sample |  |
|  | Description of sampling equipment and relevant dimensions used to collect the samples, and any cleaning procedures between sample collection |  |
|  | \* Depth and/or position the sample was collected from |  |
|  | \* Description of other sampling methodologies (e.g., vessel speed when towing a net, direction of travel, speed and direction of current, amount of water filtered) |  |
|  | Storage of samples from the field to the laboratory |  |
| **Laboratory Processing** |
|  | Specification of reagents |  |
|  | Specification on the laboratory equipment used and all relevant details |  |
| **Process for separation of microplastics from environmental matrices** |
|  | \* Sieving |  |
|  | Visual Separation |  |
|  | \* Density Separation (e.g., solution composition, concentration, volume per sample) |  |
|  | \* Chemical Digestion (e.g., chemicals used, duration of digestion, temperature, hear source, voume per sample, caveats of digestion method) |  |
|  | Filtration information |  |
| **Microplastic Categorisation & Identification for Large & Small Microplastics** |
| ***Quantification*** |
|  | Determine method for quantification, refer to Table 10 under “*Microplastic Quantification*” |  |
|  | \* Record of relevant information for quantification type |  |
| ***Physical Characterisation*** |
|  | Type (refer to “*Physical Characterisation, Type table”* within this manual) |  |
|  | Colour  |  |
|  | Size (refer to “*Physical Characterisation, Size table”* within this manual), where possible a more accurate information on individual particle sizes/volumes |  |
| ***Chemical Characterisation*** |
|  | Determination of polymer type (refer to “*Chemical Characterisation”* within this manual) |  |
|  | \* Record of relevant information for determining polymer type (e.g., size limits, pre-processing steps, acquisition parameters, spectral matching software/techniques/or methodology) |  |
|  | Percentage of total microplastic samples tested |  |
| **Data Management** |
|  | Units and size dimensions reported, must be comparable |  |
|  | Where possible, inclusion of average values with reports for variability (only possible with replication) |  |
|  | Data submitted to an open access portal (e.g., AODN, Marine Plastics Portal)  |  |
|  | Raw data of counts to be included in the Supplementary Information or uploaded to suitable site (e.g. figshare). Aim to meet FAIR Guiding Principles for scientific data. |  |
| **Reporting Results** |
|  | \* The load (e.g. microplastic concentrations estimated, post inclusion of control data).  |  |
|  | \* The lower limit of size category |  |
|  | The physical characteristics (e.g. shape, colour, sizes) |  |
|  | The chemical characteristics (presence and proportions of the different polymer types) |  |
|  | Contextual information and metadata (such as environmental data) |  |
| **Other considerations** |
|  | Can the results be published in an Open Access Journal? |  |