Working Group on Integrated Morphological and Molecular Taxonomy (WGIMT)

2019/FT/EPDSG01   The **Working Group on Integrated Morphological and Molecular Taxonomy** (WGIMT), chaired by Elaine Fileman, UK, and Jasmin Renz, Germany, will work on ToRs and generate deliverables as listed in the Table below.

	MEETING DATES	VENUE	REPORTING DETAILS	COMMENTS (CHANGE IN CHAIR, ETC.)
Year 2020	27 March	by corresp/ webex		physical meeting cancelled - remote work
Year 2021	26 February	Online meeting		
Year 2022	March	TBD	Final report by 1 June to EPDSG	

ToR descriptors

ToR	DESCRIPTION	BACKGROUND	SCIENCE PLAN CODES	DURATION	EXPECTED DELIVERABLES
a	Evaluate the potential of molecular and morphological approaches for understanding zooplankton communities	Molecular methods are widely used for rapid assessment of species diversity, and can contribute to improving our understanding of the impacts of climate change and anthropogenic effects on marine ecosystems. Standardized protocols for assessment of pelagic biodiversity are needed to fulfil requirements defined in the Marine Strategy Framework Directive (MSFD). There is a need for inter-comparison of results to understand the impact of protocol choice. A range of molecular approaches, e.g., barcoding and metabarcoding, environmental DNA (eDNA), or proteomic approaches can be adopted to help to address some of the key applications of integrative taxomony.	1.6; 1.7	year 1,2,3	Review the current methods for integrative morphological and molecular taxonomy and evaluate the impacts of choosing different protocols.
				Year 2	Construct an overview of case studies utilizing combined molecular and morphological approaches in zooplankton taxonomy.
				Year 1,2,3	Compile a list of challenging zooplankton taxa which will include a top-ten list of zooplankton species complexes in the ICES area (including hidden diversity associated with cryptic, rare, and invasive species and species delimitation).
b	Continue development and enhancement of the WGIMT Resource Portal	Locating and accessing morphological and molecular taxonomic information can be difficult: classical taxonomic references are often out-of-print or in a non-digital format; many	1.6; 1.7	Year 1	Create a glossary of molecular taxonomy terms.
				Year 1,2,3	Review and update the online WGIMT overview materials and resource links.

		molecular data are not released prior to publication; and a broad variety of methodologies and approaches exist, possibly overwhelming potential new comers to the field. The WGIMT Resource Portal will provide informational overviews and links to relevant literature and web pages, with a special focus on the use of molecular technologies (and morphological verification) for the integrative taxonomy of zooplankton.		Year 2 Year 3	Create an overview summary and reference-links to meta-barcoding primer protocols. Update the WGIMT literature library, adding keywords indices.
c	Initiate and support provision of standards, training materials, and taxonomy workshops	Lab exchanges and workshops, including ICES Taxonomy Workshops, are very effective in engaging target audiences and ensuring trained technicians and researchers for applications in fisheries and ecosystem management. Co-sponsored workshops and meetings with other SCICOM EGs will increase impact and likelihood of adoption for advisory applications.	1.6; 1.8	Year 1,2,3 Year 2,3 Year 1,2,3	Ensure provision of training materials through the WGIMT resource portal, linking to ToR b) Design, organize and offer lab exchanges and integrative taxonomy workshops Promote best practices for DNA barcoding and metabarcoding of zooplankton
D	Continue to demonstrate leadership in promoting and encouraging use of integrative taxonomic approaches for assessment of pelagic biodiversity	Integrative taxonomy is a developing field; uses and applications for fisheries and ecosystem management should be explained in high-visibility settings in ICES and other organisations through special sessions. It is important to maintain a strong foundation and visibility in primary research literature in order to validate metagenetic approaches for analysis of zooplankton diversity. Publication in peer-reviewed scientific journals will demonstrate validity of data, protocols, and results, and allow dissemination and new applications in	1.6; 1.7; 1.8	Year 1,2,3 Year 1,2,3	Organize & promote special sessions at national and international conferences: e.g. ICES ASC; ASLO/TOS Ocean Sciences Meetings. Publish peer-reviewed scientific papers on topics central to the WGIMT mission Publish peer-reviewed scientific papers on topics central to the WGIMT mission. To include two targeted review papers on 1) The crossover from microscopy to genes in marine diversity, illustrating the transition from traditional morphological species

	ecosystem management.	identification using an integrated approach to full molecular genetic identification of marine plankton communities, demonstrated on marine pelagic coepods as model taxa; 2) Zooplankton biodiversity assessment by molecular methods.

Summary of the Work Plan

Year 1	Review and evaluate protocols available to promote and accelerate use of state-of-the-art molecular approaches for biodiversity assessment and applications for management and assessment goals (ToR a). Review and update all areas of web portal (ToR b).
Year 2	Carry out collaborative activities with other SCICOM EGs to promote integrative taxonomy and publish peer reviewed scientific articles on topics central to the WGIMT mission (ToR c).
Year 3	Recommend, encourage, and enable use of integrated morphological and molecular taxonomic analysis of zooplankton in integrated ecosystem assessments in ICES area seas (ToRs a, b,).

Supporting information

Priority	The activities of this Working Group will assist ICES and its Expert Groups with issues related to the development, dissemination and application of taxonomic knowledge and skills in support of Integrated Ecosystem Understanding. Accurate identification of species and characterization of species-level diversity are and will remain foundations of integrated ecosystem assessments of function and state. Integrated taxonomic approaches – including morphological, molecular, optical, and other – may enhance and accelerate progress toward rapid, automatable, and near real-time identification of species for fisheries and integrated ecosystem assessments; detecting the impacts of climate change on species diversity, distribution, abundance; and understanding alterations in food web structure and function, and associated biogeochemical cycles. The availability of and need for new technology and techniques in taxonomic analysis make WGIMT's goals and activities important and high priority
Resource requirements	No additional resources are requested or required for planned activities.
Participants	This Expert Group now includes 50 members from 17 countries, and has a balanced representation among experts in morphological and molecular taxonomic approaches and covering a good range of taxonomic groups and ICES geographic regions. The group's annual meeting is normally attended by some 17-20 members and guests. New members are welcome.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to ACOM and group under ACOM	There are no obvious direct linkages.
Linkages to other committees or groups	WGIMT arose as a Study Group from the WGZE in response to perceived need, meeting in association with WGZE during 2012 and 2013. WGIMT will remain in close partnership with WGZE and is pursuing additional partnerships (e.g., WGPME), while promoting and supporting integrated morphological and molecular taxonomy science for the benefit of the ICES science and advisory communities as a whole.
Linkages to other organizations	The work of this group relates to and is connected to a diversity of other projects and organisations, e.g. SCOR WG157 MetaZooGene, BONUS BIO-C3 project, NOAA COPEPOD and COPEPODITE, GOBI, and others.