

## Working Group on Integrated Morphological and Molecular Taxonomy (WGIMT)

2016/MA2/SSGEPD04 The Working Group on Integrated Morphological and Molecular Taxonomy (WGIMT), chaired by Naiara Rodriguez-Ezpeleta\*, Spain, and Elaine Fileman\*, UK, will work on ToRs and generate deliverables as listed in the Table below.

	MEETING DATES	VENUE	REPORTING DETAILS	COMMENTS (CHANGE IN CHAIR, ETC.)
Year 2017	31 March	Boulogne-sur-Mer, France	Interim report by 1 June to SSGEPD	
Year 2018	24 March	Helsinki, Finland	Interim report by 1 June to SSGEPD	<b>Change of Chair:</b> Outgoing: Ann Bucklin Incoming: Elaine Fileman and Naiara Rodriguez-Ezpeleta
Year 2019			Final report by 1 June to SCICOM	

### ToR descriptors

ToR	DESCRIPTION	BACKGROUND	SCIENCE PLAN TOPICS ADDRESSED	DURATION	EXPECTED DELIVERABLES
A	Ensure balanced morphological – molecular expertise among membership of WGIMT	a) Integrative taxonomy requires experts in both morphological and molecular taxonomic approaches. b,c) Members in common will facilitate coordination between WGIMT and SCICOM EGs and help ensure goals are met.	1,2,9,10,27,28,31	Year 1,2,3	WGIMT will continue to add new members, who are experts in morphological and molecular taxonomy for major zooplankton groups; 2 members in common with other SCICOM EGs.
B	Fully populate the WGIMT web platform with information, protocols and resources to support progress in research and development	a) Locating and accessing morphological and molecular taxonomic information can be difficult: some classical taxonomic references are out-of-print; molecular data are not released prior to publication. b,c) Open access to data and information will expand use of state-of-the-art molecular technologies (e.g., High-Throughput Sequencing) for integrative taxonomy of zooplankton.	27,28,31	Years 1,2,3	Complete and fully populate all areas of WGIMT.net web portal (Year 1). Complete specially-designed elements and deep links to support and promote use of technologies (Years 1, 2).
C	Initiate and support provision of standards, training materials, and taxonomy workshops	a,b) Workshops, including ICES Taxonomy Workshops, are very effective in engaging target audiences and ensuring trained technicians and researchers for applications in fisheries and	27,28,31	Year 2	Design, organize and offer integrative taxonomy workshops; request support via ICES Taxonomy

		ecosystem management. c) Co-sponsored workshops and meetings with other SCICOM EGs will increase impact and likelihood of application for advisory applications.			Workshop funds (Year 2)
D	Demonstrate leadership in promoting and encouraging use of integrative taxonomic approaches for assessment of pelagic biodiversity	a,b,c) Integrative taxonomy is an emergent field; uses and applications for fisheries and ecosystem management should be explained in high-visibility settings in ICES and other organisations through special sessions	1,2,9	Years 1,2,3	Organize special sessions at national and international conferences: ASLO/TOS Ocean Sciences Meetings; ICES ASC (Years 1, 2, 3).
E	Advise on the implications of developments for marine science and management	b,c) Integrative taxonomy (e.g., 'library' of DNA sequences for accurately-identified species) can provide a foundation for genetic methods for assessing species, diversity and abundance in integrated ecosystem assessments. c) Standardized metagenetic data can fulfill requirements of biodiversity assessments (WGPME) and indicators defined in the Marine Strategy Framework Directive (WGAGFM).	28,31	Years 2,3	Report via SSGEPD and SCICOM EGs on promise, progress and pitfalls , of metagenetics (metabarcoding) for integrated ecosystem assessments (Years 1, 2, 3).
F	Publish high-profile peer-reviewed articles that provide documented evidence of advances in metagenetic analysis of zooplankton diversity, distribution, and abundance.	a) Stronger foundation and visibility in primary research literature is needed to establish the validity of metagenetic approaches for analysis of zooplankton diversity. b) Publication in peer-reviewed scientific journals will demonstrate validity of data, protocols, and results, and allow dissemination and new applications in ecosystem management.	1,2,9,10	Years 1, 2, 3	Publish two papers focused on integrative taxonomy of zooplankton using state-of-the-art molecular approaches, including overview, review, and perspective articles (Years 1, 2, 3).
G	Determine the status of microzooplankton time-series data collection within the ICES area.	a, c) Determine the status of microzooplankton time-series data collection within the ICES area, assess progress made in this area over the last ten years, and identify collaboration, gaps or overlap with other WGs (WGZE, WGPME).	1,2,9,10	Years 2, 3	List of scientists and laboratories measuring microzooplankton groups within time-series datasets; data table to compare sampling and analysis methods, indicate which groups are regularly counted or routinely

					missed; database input; webpage update.
H	Review and evaluate methodologies used for metagenetic analysis of plankton.	a, c) Recommend development of standardized protocols for applications in fisheries management and ecosystem assessment.	1,2,9,10	Years 2, 3	Present findings at scientific conferences (Year 2); Report to EG members and ICES community (Year 2, 3); prepare manuscript for publication in peer-reviewed journal (Year 3).

### Summary of the Work Plan

Year 1	Recruit new members for WGIMT, ensuring balanced membership (ToR a); fully populate all areas of web portal (ToR b). Cooperate with other SCICOM EGs to promote and accelerate use of state-of-the-art molecular approaches for biodiversity assessment and applications for management and assessment goals (ToR e).
Year 2	Carry out collaborative activities with other SCICOM EGs to promote integrative taxonomy (ToR c). Publish peer reviewed scientific articles on topics central to the WGIMT mission (ToR f). Compile and disseminate information on microzooplankton (ToR g).
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 d,e,f,h).

### Supporting information

Priority:	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 of 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:	The Expert Group now includes 42 members from 15 countries, with strong representation among experts in morphological and molecular taxonomic approaches. We continue to seek additional members, including especially members from partner ICES Working Groups and other scientists with needed expertise and knowledge. The goal is to maintain balance and coverage of varied taxonomic approaches (including morphological taxonomists for the full range of taxonomic groups) and ICES geographic regions.
Secretariat facilities:	None.
Financial:	No financial implications.

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Linkages to ACOM and groups under ACOM:	None.
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, WGAGFM), 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., EU DEVOTES (DEVELOPMENT OF innovative TOOLS for understanding marine biodiversity and assessing Good Environmental Status), BONUS BIO-C3 project, NOAA COPEPOD and COPEPODITE, GOBI, and others.

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