International Oat Nomenclature Committee Meeting

30 April 2021 / 13:00 UTC / Zoom Conference

Attendees

Nick Tinker (ex officio; temporary chair), Catherine Howarth (ex officio), Victoria Blake, Matthias Herrmann, Yung-Fen Huang, Rick Jellen, Andreas Katsiotis, Tim Langdon, Chengdao Li, Martin Mascher, Robert Park, Charlene Wight

Agenda

- Introductions
- Additions to agenda
- Goals and purpose of the committee
- Nominations for Chair and secretary
- Resolution on oat chromosome nomenclature – discussion – vote on approval
- Next steps / next meeting

Introductions. Those present introduced themselves, stating their expertise and potential contribution to the committee.

In early 2021 a call for nominees for the new nomenclature committee was put out to the oat research community. All nominees (Table 1) were confirmed by the International Oat Conference Committee.

Table 1. 2021 Nominees for the International Oat Nomenclature Committee

T_2021_Nomenclature_nominees					
Name1	**Name2**	**Role**	**Country**	**Institution**	**Expertise**
James	Chong	Advisor (not voting)	Canada	retired	Crown rust genes / long-time committee member
Catherine	Howarth	ex-officio IOC Chair (no vote)	UK	IBERS	Oat genomics / IOC co-Chair
Nick	Tinker	ex-officio IOC Chair (no vote)	Canada	AAFC	Oat genomics / IOC co-Chair
Victoria	Blake	Nominee - confirmed	USA	Montana State University	GrainGenes / maps and markers

Matthias	Herrmann	Nominee - confirmed	Germany	JKI	Oat breeding research, resistance breeding, gene mapping, QTL
Yungfen	Huang	Nominee - confirmed	Taiwan/China	National Taiwan University	Genomics and forage trait-related genetics and breeding.
Rick	Jellen	Nominee - confirmed	USA	BYU	Genomics and cytogenetics
Andreas	Katsiotis	Nominee - confirmed	Cyprus	Cyprus University of Technology	Genomics and cytogenetics
Tim	Langdon	Nominee - confirmed	UK	IBERS	Oat Genomics
Chengdao	Li	Nominee - confirmed	Australia	Murdoch U	Genomics / genome sequencing
Martin	Mascher	Nominee - confirmed	Germany	Helmholtz center Munich	Bioinformatics, PanOat coordinator
Robert	Park	Nominee - confirmed	Australia	U Sydney	Rust genes / molecular pathology
Taner	Sen	Nominee - confirmed	USA	USDA/ARS	GrainGenes / genomics
Charlene	Wight	Nominee - confirmed	Canada	AAFC	Historical oat QTL, oat newsletter

Notes

Nominations.

- Chair. Rick Jellen and Martin Mascher were nominated. Rick accepted the nomination and Martin agreed to be the 'deputy' chair. Both were elected with unanimous consent.
- Secretary. Victoria Blake was nominated, accepted the nomination, and was elected with unanimous consent.

Chromosome nomenclature

Prior to the meeting, the IONC nominees were invited to view a presentation from Martin Mascher via a Zoom meeting hosted at IPK. The invitation from Nick Tinker read as follows.

Dear all,
It looks like Friday April 30 12pm GMT will be the most suitable for the first nomenclature meeting. I will send an invite so that there is no time confusion.
There is an urgent matter that I would like this new committee to address at this first meeting, if possible, and this is the new chromosome nomenclature that you will now find in the Version 3 of PepsiCo's OT3089 reference genome that was released yesterday:
Genome Browser: https://wheat.pw.usda.gov/jb?data=/ggds/oat-ot3098v2-pepsico
This will not be new for those of you on the PanOat project, but several of you will not have seen this, including the justification for the re-numbering from a previous version. Much work has been put into making sure that this will be the BEST and FINAL chromosome nomenclature for oat, but it is important that this committee, which was selected independently and approved by the IOC, will put a stamp of approval on it (or not).
The justification for the renumbering and for the chromosome orientations requires a walk through some careful analyses that will include comparison to pre-publication results from work led by ScanOat. For those of you who have not seen this presentation, Dr Martin Mascher who has been instrumental in this breakthrough is willing to give you a presentation. I highly recommend this both because it will inform your vote, but also because it includes a preview of some wonderful new oat genome science.

Resolution on chromosome nomenclature (for vote):

Whereas: (1) Members of the IONC have been oriented to unpublished data involving an in-depth phylogeny-based analysis of the ScanOat genome, (2) the IONC agrees that this analysis demonstrates that hexaploid oat chromosomes contain conserved core regions defined by groups of single-copy-homeologs with collinearity that, to the best of our knowledge, is conserved across the genus Avena and with the Triticeae barley and wheat, (3) that this supports a phylogeny-based numbering and orientation whereby hexaploid, tetraploid, and diploid Avena chromosomes can be numbered and oriented based on an ancestral core region that is consistent with the Triticeae, (4) that the unpublished ScanOat genome is essentially collinear with Version 2 of the Pepsico OT3098 genome, which is publically available on GrainGenes, and that the new recommended nomenclature has now been incorporated into the naming and orientation of the pseudomolecules of the OT3098 V2 reference genome, (5) that orientation necessitates that the short arm will not always appear at the top, thus we will refer to the arms using the letters "p" (for premiere) and "q" (for queue) – thus 1Aq would refer to the bottom arm of chromosome 1A – and (5) that this nomenclature is summarized in relation to previous nomenclatures in the table below.

Be it resolved that: The IONC is confident that this chromosome nomenclature will provide the best, most consistent, science-based representation of oat chromosomes, and that the IONC recommends this nomenclature be used in further oat genome research. The IONC recommends that GrainGenes post the table below to assist with comparative genomics research involving studies where legacy nomenclature has been used, and that GrainGenes should continue to develop additional systems to facilitate meaningful comparisons of work using the new nomenclature with historical data.

This was discussed briefly and passed unanimously by the IONC.

2021: New recommended nomenclature	Sanz et al. Cytology-based nomenclature	Consensus Linkage map (Chaffin et al.)	Orientation to Mrg groups	Short Arm First
chr1A	17A	Mrg18	-	TRUE
chr1C	7C	Mrg28	-	FALSE
chr1D	10D	Mrg01	-	TRUE
chr2A	15A	Mrg33	+	TRUE
chr2C	5C	Mrg13	+	TRUE
chr2D	12D	Mrg08	-	FALSE
chr3A	11A	Mrg23	+	FALSE
chr3C	2C	Mrg15	-	FALSE
chr3D	21D	Mrg19	+	TRUE
chr4A	19A	Mrg20	+	TRUE
chr4C	1C	Mrg11	+	FALSE
chr4D	20D	Mrg21	+	TRUE
chr5A	8A	Mrg24	+	TRUE
chr5C	4C	Mrg03	-	TRUE
chr5D	14D	Mrg06	-	TRUE

chr6A	16A	Mrg05	+	TRUE
chr6C	3C	Mrg17	-	FALSE
chr6D	18D	Mrg04	-	TRUE
chr7A	13A	Mrg12	+	FALSE
chr7C	6C	Mrg09	-	FALSE
chr7D	9D	Mrg02	-	TRUE

Sanz *et al.* doi: 10.1007/s00122-010-1409-3

Chaffin *et al.* doi: 10.3835/plantgenome2015.10.0102

Next Meeting - to be scheduled near the end of June

Agenda - TBA

Prepared by Victoria Blake, 01 May 2021

Appendix 1. Background and Recommendations to the new IONC. (Nick Tinker 30 April 2021)