

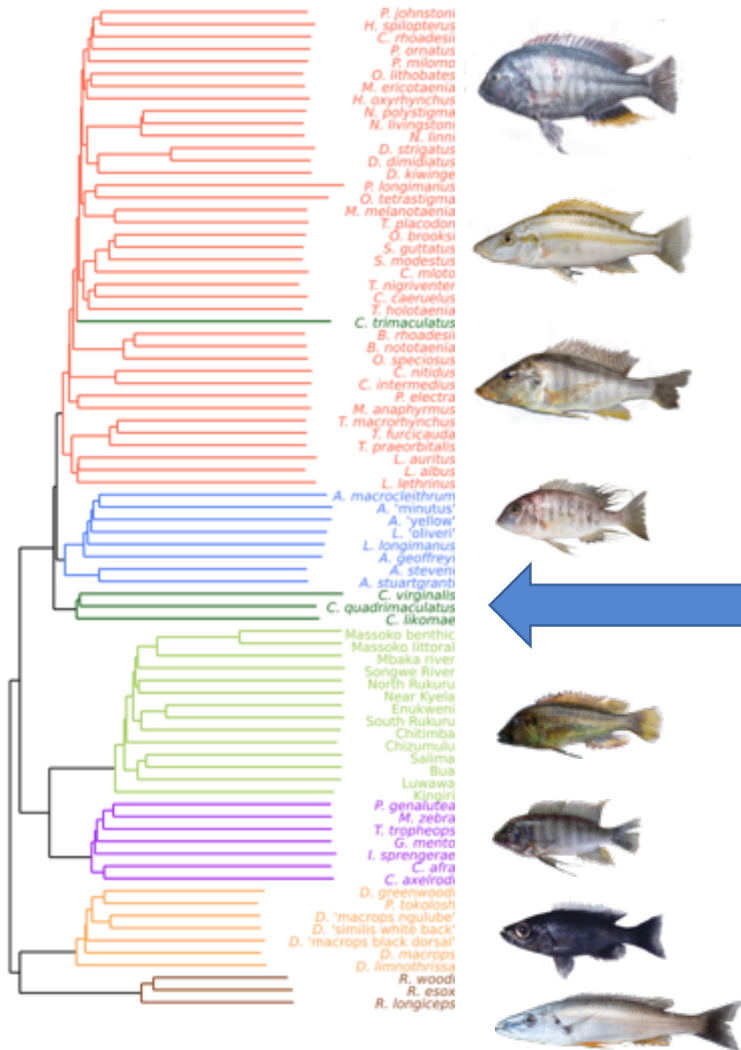
Welcome to the real world: local adaptation in Lake Malawi utaka cichlids



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Utaka within the Lake Malawi radiation



- genus *Copadichromis*
- several tens of species
- plankton feeding (semi-) open-water species
- important for fisheries: up to 50% of the catch

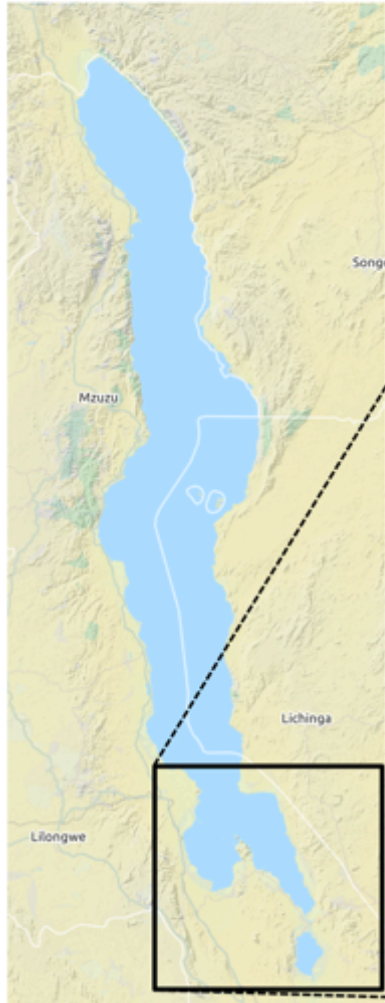
C. virginalis



~15% of catch in 1999
decreasing?

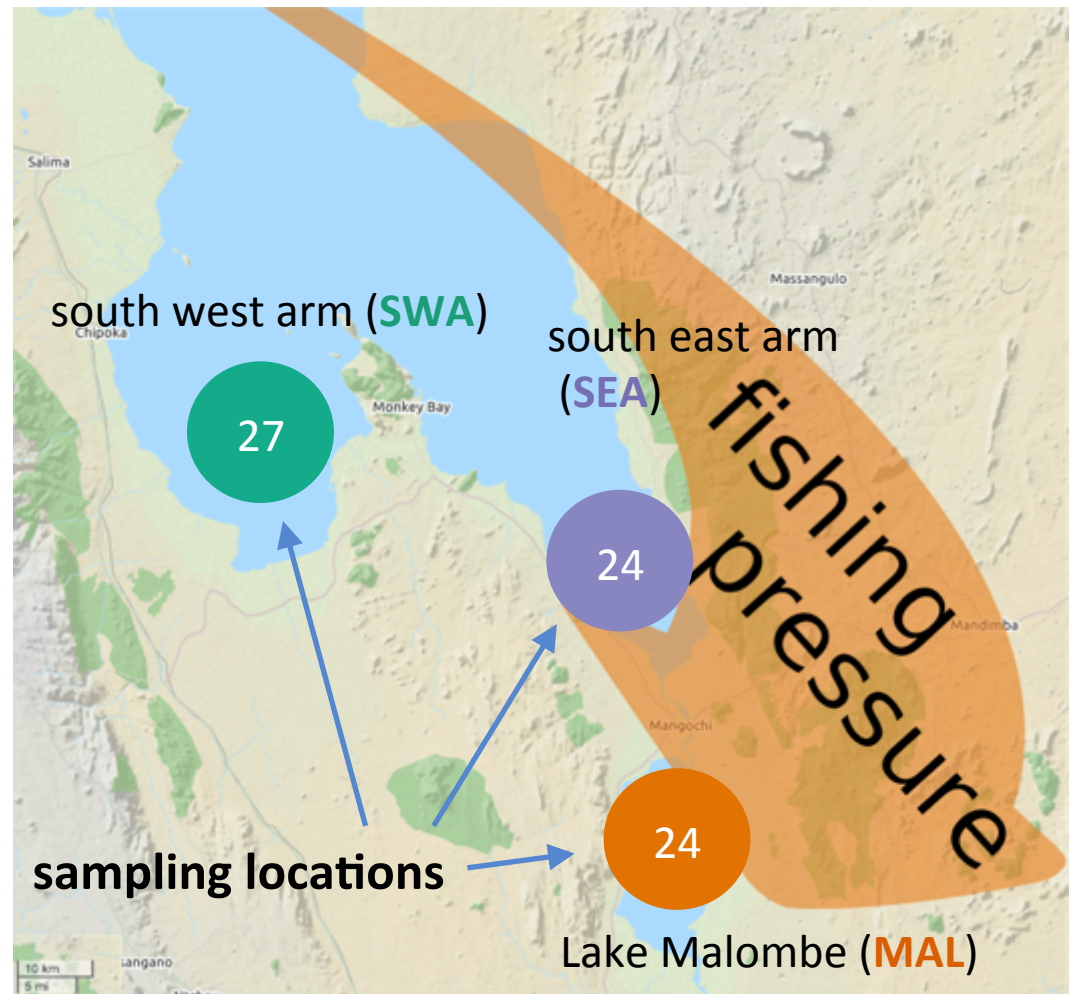
Increasing fishing pressure in the south of Lake Malawi

Lake Malawi



Increasing fishing pressure in the south of Lake Malawi

- target species:
 - *C. virginalis*
- ~24 samples from three locations
- representing increasing fishing pressure
- decreasing observed adult size
- whole genome sequencing



Field observations

Lake Malombe



2 cm

Lake Malawi



- Bad visibility in Malombe
- Breeding males of both species in Malombe much smaller
- Size difference could be
 - demographic
 - environmental (plasticity)
 - **genetic**



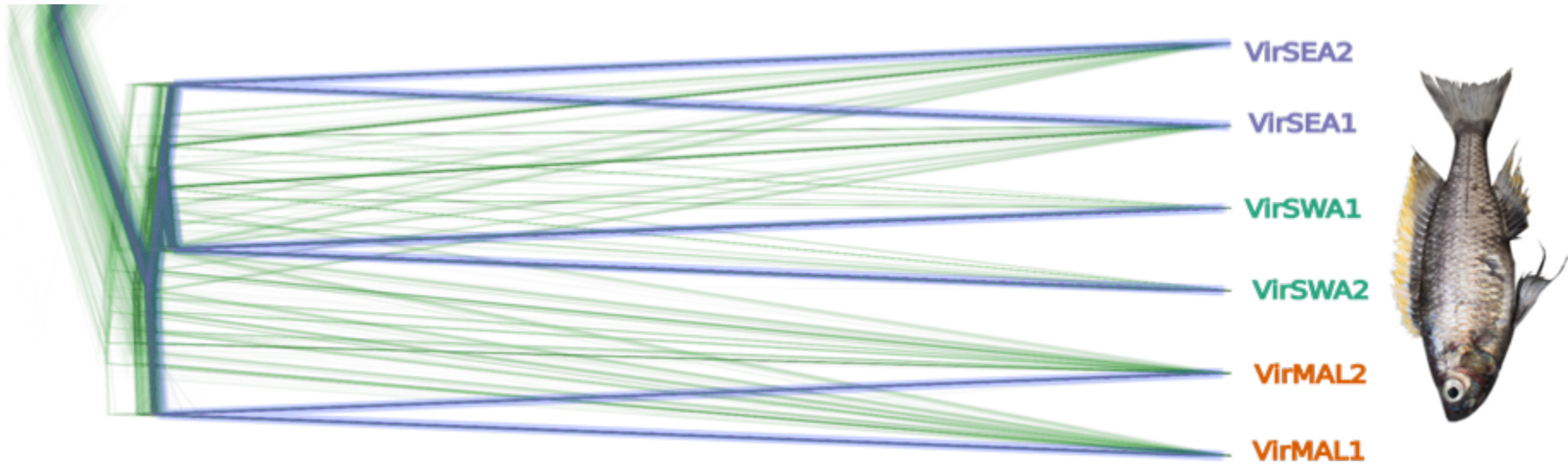
	vcf_sample_ids
Tilapia (outgroup ~20 million years)	['OreSqu1']
C. virginalis Malombe fishing pressure: 4	['VirMAL1', 'VirMAL2', 'VirMAL3', 'VirMAL4', 'VirMAL5', 'VirMAL6', 'VirMAL7', 'VirMAL8', 'VirMAL9', 'VirMAL10', 'VirMAL11', 'VirMAL12', 'VirMAL13', 'VirMAL14', 'VirMAL15', 'VirMAL16', 'VirMAL17', 'VirMAL18', 'VirMAL19', 'VirMAL20', 'VirMAL21', 'VirMAL22', 'VirMAL23', 'VirMAL24']
C. virginalis South East Arm fishing pressure: 2	['VirSEA1', 'VirSEA2', 'VirSEA3', 'VirSEA4', 'VirSEA5', 'VirSEA6', 'VirSEA7', 'VirSEA8', 'VirSEA9', 'VirSEA10', 'VirSEA11', 'VirSEA12', 'VirSEA13', 'VirSEA14', 'VirSEA15', 'VirSEA16', 'VirSEA17', 'VirSEA18', 'VirSEA19', 'VirSEA20', 'VirSEA21', 'VirSEA22', 'VirSEA23', 'VirSEA24']
C. virginalis South West Arm fishing pressure: 1	['VirSWA1', 'VirSWA2', 'VirSWA3', 'VirSWA4', 'VirSWA5', 'VirSWA6', 'VirSWA7', 'VirSWA8', 'VirSWA9', 'VirSWA10', 'VirSWA11', 'VirSWA12', 'VirSWA13', 'VirSWA14', 'VirSWA15', 'VirSWA16', 'VirSWA17', 'VirSWA18', 'VirSWA19', 'VirSWA20', 'VirSWA21', 'VirSWA22', 'VirSWA23', 'VirSWA24', 'VirSWA25', 'VirSWA26', 'VirSWA27']

Data

- cichlid_sample_metadata.csv
- phased SNP data for three Contigs
 - Contig237, Contig262, Contig263
- 54881 SNPs

id	genus	species	place	fishing_pressure
VirSWA1	Copadichromis	virginalis	South West Arm	1
VirSWA2	Copadichromis	virginalis	South West Arm	1
VirSWA3	Copadichromis	virginalis	South West Arm	1
VirSWA4	Copadichromis	virginalis	South West Arm	1
VirSWA5	Copadichromis	virginalis	South West Arm	1
VirSWA6	Copadichromis	virginalis	South West Arm	1
VirSWA7	Copadichromis	virginalis	South West Arm	1
VirSWA8	Copadichromis	virginalis	South West Arm	1
VirSWA9	Copadichromis	virginalis	South West Arm	1
VirSWA10	Copadichromis	virginalis	South West Arm	1
VirSWA11	Copadichromis	virginalis	South West Arm	1
VirSWA12	Copadichromis	virginalis	South West Arm	1
VirSWA13	Copadichromis	virginalis	South West Arm	1
VirSWA14	Copadichromis	virginalis	South West Arm	1
VirSWA15	Copadichromis	virginalis	South West Arm	1
VirSWA16	Copadichromis	virginalis	South West Arm	1

Genetic relationships



What you should do

- Use the same methods to look for selection, local adaptation.
- Think about a hypothesis to test:
 - e.g., adaptation to heavy fishing in Malombe
- Do some basic quality checks on the data.
- Think about the advantages/downsides different methods.
- Which method is suited to address your hypothesis and why?
- How can you “validate” your peaks? (e.g., use methods that make use of different signals in the data)

Evaluation



Evaluation

- Convince a panel of reviewers (who are specialist in the methods you used)
 - that you found something interesting
 - that your application of the methods is sound and fit for the particular question
 - that you made sufficient checks that your results are not an artefact

ADDRESSING REVIEWER COMMENTS

BAD REVIEWS ON YOUR PAPER? FOLLOW THESE GUIDELINES AND YOU MAY YET GET IT PAST THE EDITOR:

<p>Reviewer comment: "The method/ device/ paradigm the authors propose is clearly wrong."</p> <p>How NOT to respond: ✗ "Yes, we know. We thought we could still get a paper out of it. Sorry."</p> <p>Correct response: ✓ "The reviewer raises an interesting concern. However, as the focus of this work is exploratory and not performance-based, validation was not found to be of critical importance to the contribution of the paper."</p>	<p>Reviewer comment: "The authors fail to reference the work of Smith et al., who solved the same problem 20 years ago."</p> <p>How NOT to respond: ✗ "Huh. We didn't think anybody had read that. Actually, their solution is better than ours."</p> <p>Correct response: ✓ "The reviewer raises an interesting concern. However, our work is based on completely different first principles (we use different variable names), and has a much more attractive graphical user interface."</p>	<p>Reviewer comment: "This paper is poorly written and scientifically unsound. I do not recommend it for publication."</p> <p>How NOT to respond: ✗ "You #&@*% reviewer! I know who you are! I'm gonna get you when it's my turn to review!"</p> <p>Correct response: ✓ "The reviewer raises an interesting concern. However, we feel the reviewer did not fully comprehend the scope of the work, and misjudged the results based on incorrect assumptions."</p>
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