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1 **Supporting Information**

2

3 **Title:** Pseudogenization of *Mclr* gene associated with transcriptional
4 changes related to melanogenesis explains leucistic phenotypes in
5 *Oreonectes* cavefish (Cypriniformes, Nemacheilidae)

6

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22 Short running title: Leucistic *Oreonectes* cavefish

23 **Supplementary Table S1.** List of the species used in this study, with GenBank accession numbers
 24 of mitochondrial genes.

Family	Species name	Accession number
Outgroups		
Cobitidae	<i>Cobitis sinensis</i>	AY526868.1
	<i>Misgurnus guillicaudatus</i>	KM186181.1
Balitoridae	<i>Jinshaia sinensis</i>	JX155733.1
	<i>Sinogastromyzon sichangensis</i>	KF711948.1
Ingroups		
Nemacheilidae	<i>Aborichthys elongatus</i>	NC_031582.1
	<i>Acanthocobitis botia</i>	NC_033958.1
	<i>Barbatula barbatula</i>	KP715096.1
	<i>Barbatula nuda</i>	NC_022858.1
	<i>Barbatula toni</i>	KM405199.1
	<i>Schistura balteata</i>	AB242172.1
	<i>Schistura longa</i>	KT213583.1
	<i>Schistura corica</i>	NC_031640.1
	<i>Schistura geisleri</i>	NC_029437.1
	<i>Schistura pridii</i>	NC_031638.1
	<i>Schistura jarutanini</i>	NC_031584.1
	<i>Schistura scaturigina</i>	NC_031378.1
	<i>Schistura sikmaiensis</i>	NC_034746.1
	<i>Schistura notostigma</i>	NC_031585.1
	<i>Triplophysa aliensis</i>	KT213584.1
	<i>Triplophysa lixianensis</i>	NC_030521.1
	<i>Triplophysa stenura</i>	NC_032692.1
	<i>Triplophysa brevicauda</i>	KT213588.1
	<i>Triplophysa nujiangensis</i>	KT213598.1
	<i>Triplophysa stewartia</i>	KT213605.1
	<i>Triplophysa tibetana</i>	KM212178.1
	<i>Triplophysa microps</i>	KT213595.1
	<i>Triplophysa chondrostoma</i>	KT213589.1
	<i>Triplophysa markehenensis</i>	KT213594.1
	<i>Triplophysa stoliczkai</i>	NC_017890.1
	<i>Triplophysa leptosoma</i>	KT213593.1
	<i>Triplophysa xichangensis</i>	KT224366.1
	<i>Triplophysa moquensis</i>	KT213597.1
	<i>Triplophysa dorsalis</i>	KT241024.1
	<i>Triplophysa strauchii</i>	KP297875.1
	<i>Triplophysa ulacholica</i>	KT259194.1
	<i>Triplophysa tenuis</i>	KT224363.1
	<i>Triplophysa scleropter</i>	KT213602.1
	<i>Triplophysa dalaica</i>	KT213590.1
	<i>Triplophysa wuweiensis</i>	KT224365.1
	<i>Triplophysa anterodorsalis</i>	NC_024597.1
	<i>Triplophysa bleekeri</i>	JX135578.1
	<i>Triplophysa hsutschouensis</i>	KT213592.1
	<i>Triplophysa orientalis</i>	NC_030505.1
	<i>Triplophysa venusta</i>	KT008666.1
	<i>Triplophysa brevibarba</i>	KY971608.1
	<i>Triplophysa pappenheimi</i>	KY419201.1
	<i>Triplophysa robusta</i>	KM396312.1
	<i>Triplophysa pseudoscleroptera</i>	KU587513.1

<i>Triplophysa pseudostenura</i>	KT213601.1
<i>Triplophysa siluroides</i>	NC_024611.1
<i>Triplophysa xiangxiensis</i>	KT751089.1
<i>Triplophysa rosa</i>	NC_019587.1
<i>Homatula potanini</i>	NC_025321.1
<i>Homatula variegatus</i>	NC_020095.1
<i>Oreonectes platycephalus</i>	NC_031579
<i>Lefua costata</i>	KT943751.1
<i>Lefua nikkonis</i>	AP011300.1

26 * The newly generated data are underlined.

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30 **Supplementary Table S2.** Comparison of De Novo Transcriptome Assemblies of *O. shuilongensis*
 31 and other fishes.

Species	<i>Oreonectes shuilongensis</i>	<i>Amphiprion Percula</i>	<i>Fundulus heteroclitus</i>	<i>Hucho taimen</i>	<i>Salmo Salar</i>
Contig Number	99,305	88,074	180,658	242,069	36,505
N50 Length	3,571	1,969	1,189	10.60	2,464
BUSCO completeness	89.60%	70.00%	70.25%	55.77%	79.00%
Complete single-copy BUSCOs	43.85%	-	42.20%	29.87%	42.00%
Complete duplicated BUSCOs	45.75%	-	28.05%	25.90%	37.00%
Fragmented BUSCOs	5.24%	15.40%	7.45%	18.93%	10.00%
Missing BUSCOs	5.26%	14.60%	22.30%	25.30%	10.00%
Reference	This study	Maytin et al. 2018	Rana et al. 2016	Tong et al. 2017	Carruthers et al. 2018

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33 Maytin AK, Davies SW, Smith GE, Mullen SP and Buston PM (2018) *De novo* Transcriptome
 34 Assembly of the Clown Anemonefish (*Amphiprion percula*): A New Resource to Study the
 35 Evolution of Fish Color. *Front. Mar. Sci.* 5:284.

36 Rana SB, Zadlock FJ IV, Zhang Z, Murphy WR, Bentivegna CS (2016) Comparison of *De Novo*
 37 Transcriptome Assemblers and k-mer Strategies Using the Killifish, *Fundulus heteroclitus*. *PLoS*
 38 ONE 11(4): e0153104.

39 Tong GX, Xu W, Zhang YQ, Zhang QY, Yin JS, Kuang YY (2018) *De novo* assembly and
 40 characterization of the *Hucho taimen* transcriptome. *Ecol Evol.* 8:1271 – 1285.

41 Carruthers M, Yurchenko AA, Augley JJ, Adams CE, Herzyk P, Elmer KR (2018) *De novo*
 42 transcriptome assembly, annotation and comparison of four ecological and evolutionary model
 43 salmonid fish species. *BMC Genomics.* 19: 32.

44 **Supplementary Fig. S1.** Coding sequences of *Mcl1r* genes of *O. daqikongensis*, *O. jiarongensis*, *O.*
 45 *dongliangensis* and *O. shuilongensis*. Asterisks denote fully conserved sites.

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O. jiarongensis1 ATGAACGACTCGTCACCTTCCCAATCACTTCGGCATCAGCACATGGATCACAGCGGCGCAA
O. jiarongensis2 ATGAACGACTCGTCACCTTCCCAATCACTTCGGCATCAGCACATGGATCACAGCGGCGCAA
O. dongliangensis1 ATGAACGACTCGTCACCTTCCCAATCACTTCGGCATCAGCACATGGATCACAGCGGCGCAA
O. dongliangensis2 ATGAACGACTCGTCACCTTCCCAATCACTTCGGCATCAGCACATGGATCACAGCGGCGCAA
O. shuilongensis1 ATGAACGACTCGTCACCTTCCCAATCACTTCGGCATCAGCACATGGATCACAGCGGCGCAA
O. shuilongensis2 ATGAACGACTCGTCACCTTCCCAATCACTTCGGCATCAGCACATGGATCACAGCGGCGCAA
O. daqikongensis1 ATGAACGACTCGTCACCTTCCCAATCACTTCGGCATCAGCACATGGATCACAGCGGCGCAA
O. daqikongensis2 ATGAACGACTCGTCACCTTCCCAATCACTTCGGCATCAGCACATGGATCACAGCGGCGCAA
O. daqikongensis3 ATGAACGACTCGTCACCTTCCCAATCACTTCGGCATCAGCACATGGATCACAGCGGCGCAA
*****

O. jiarongensis1 CATTGCTACAATACCGACATGAACGTCACCTTTCAGCAGCAACATAACGCCCGGGGACACG
O. jiarongensis2 CATTGCTACAATACCGACATGAACGTCACCTTTCAGCAGCAACATAACGCCCGGGGACACG
O. dongliangensis1 TATTGCTACAATACCGACATGAACGTCACCTTTCAGCAGCAACATAACGCCCGGGGACACG
O. dongliangensis2 CATTGCTACAATACCGACATGAACGTCACCTTTCAGCAGCAACATAACGCCCGGGGACACG
O. shuilongensis1 CATTGCTACAATACCGACATGAACGTCACCTTTCAGCAGCAACATAACGCCCGGGGACACG
O. shuilongensis2 CATTGCTACAATACCGACATGAACGTCACCTTTCAGCAGCAACATAACGCCCGGGGACACG
O. daqikongensis1 CATTGCTACAATACCGACATGAACGTCACCTTTCAGCAGCAACATAACGCCCGGGGACACG
O. daqikongensis2 CATTGCTACAATACCGACATGAACGTCACCTTTCAGCAGCAACATAACGCCCGGGGACACG
O. daqikongensis3 CATTGCTACAATACCGACATGAACGTCACCTTTCAGCAGCAACATAACGCCCGGGGACACG
*****

O. jiarongensis1 AACGCCACGGGCATCTCCACATCATGATCCCCAGGAGCTGTTTCTCGTGCTCGGCTTA
O. jiarongensis2 AACGCCACGGGCATCTCCACATCATGATCCCCAGGAGCTGTTTCTCGTGCTCGGCTTA
O. dongliangensis1 AACGCCACGGGCATCTCCACATCATGATCCCCAGGAGCTGTTTCTCGTGCTCGGCTTA
O. dongliangensis2 AACGCCACGGGCATCTCCACATCATGATCCCCAGGAGCTGTTTCTCGTGCTCGGCTTA
O. shuilongensis1 AACGCCACGGGCATCTCCACATCATGATCCCCAGGAGCTGTTTCTCGTGCTCGGCTTA
O. shuilongensis2 AACGCCACGGGCATCTCCACATCATGATCCCCAGGAGCTGTTTCTCGTGCTCGGCTTA
O. daqikongensis1 AACGCCACGGGCATCTCCACATCATGATCCCCAGGAGCTGTTTCTCGTGCTCGGCTTA
O. daqikongensis2 AACGCCACGGGCATCTCCACATCATGATCCCCAGGAGCTGTTTCTCGTGCTCGGCTTA
O. daqikongensis3 AACGCCACGGGCATCTCCACATCATGATCCCCAGGAGCTGTTTCTCGTGCTCGGCTTA
*****

O. jiarongensis1 ATCAGTTTGGTAGAGAACATTTTGGTGGTTCGGCGATCATCAAGAACAGGAATCTCCAT
O. jiarongensis2 ATCAGTTTGGTAGAGAACATTTTGGTGGTTCGGCGATCATCAAGAACAGGAATCTCCAT
O. dongliangensis1 ATCAGTTTGGTAGAGAACATTTTGGTGGTTCGGCGATCATCAAGAACAGGAATCTCCAT
O. dongliangensis2 ATCAGTTTGGTAGAGAACATTTTGGTGGTTCGGCGATCATCAAGAACAGGAATCTCCAT
O. shuilongensis1 ATCAGTTTGGTAGAGAACATTTTGGTGGTTCGGCGATCATCAAGAACAGGAATCTCCAT
O. shuilongensis2 ATCAGTTTGGTAGAGAACATTTTGGTGGTTCGGCGATCATCAAGAACAGGAATCTCCAT
O. daqikongensis1 ATCAGTTTGGTAGAGAACATTTTGGTGGTTCGGCGATCATCAAGAACAGGAATCT----
O. daqikongensis2 ATCAGTTTGGTAGAGAACATTTTGGTGGTTCGGCGATCATCAAGAACAGGAATCT----
O. daqikongensis3 ATCAGTTTGGTAGAGAACATTTTGGTGGTTCGGCGATCATCAAGAACAGGAATCT----
*****

O. jiarongensis1 TCGCCCATGTATTATTTTATCTGCTGCTGCTGGCGGTGCTGACATGCTGGTGAGCGTCAGC
O. jiarongensis2 TCGCCCATGTATTATTTTATCTGCTGCTGCTGGCGGTGCTGACATGCTGGTGAGCGTCAGC
O. dongliangensis1 TCGCCCATGTATTATTTTATCTGCTGCTGCTGGCGGTGCTGACATGCTGGTGAGCGTCAGC
O. dongliangensis2 TCGCCCATGTATTATTTTATCTGCTGCTGCTGGCGGTGCTGACATGCTGGTGAGCGTCAGC
O. shuilongensis1 TCGCCCATGTATTATTTTATCTGCTGCTGCTGGCGGTGCTGACATGCTGGTGAGCGTCAGC
O. shuilongensis2 TCGCCCATGTATTATTTTATCTGCTGCTGCTGGCGGTGCTGACATGCTGGTGAGCGTCAGC
O. daqikongensis1 -----GCTGGCGGTGCTGACATGCTGGTGAGCGTCAGC
O. daqikongensis2 -----GCTGGCGGTGCTGACATGCTGGTGAGCGTCAGC
O. daqikongensis3 -----GCTGGCGGTGCTGACATGCTGGTGAGCGTCAGC
*****

O. jiarongensis1 AACGTGGTGGAGACGCTCTTCATGTTATTGATGGAGCAAGGGCTACTGCTCGTCAAGGCA
O. jiarongensis2 AACGTGGTGGAGACGCTCTTCATGTTATTGATGGAGCAAGGGCTACTGCTCGTCAAGGCA
O. dongliangensis1 AACGTGGTGGAGACGCTCTTCATGTTATTGATGGAGCAAGGGCTACTGCTCGTCAAGGCA
O. dongliangensis2 AACGTGGTGGAGACGCTCTTCATGTTATTGATGGAGCAAGGGCTACTGCTCGTCAAGGCA
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O. shuilongensis2 AACGTGGTGGAGACGCTCTTCATGTTATTGATGGAGCAAGGGCTACTGCTCGTCAAGGCA
O. daqikongensis1 AACGTGGTGGAGACGCTCTTCATGTTATTGATGGAGCAAGGGCTACTGCTCGTCAAGGCA
O. daqikongensis2 AACGTGGTGGAGACGCTCTTCATGTTATTGATGGAGCAAGGGCTACTGCTCGTCAAGGCA
O. daqikongensis3 AACGTGGTGGAGACGCTCTTCATGTTATTGATGGAGCAAGGGCTACTGCTCGTCAAGGCA
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0. jiarongensis1 AAGATGTTACAGCACCTGGACAACG TGATCGACATCATGAGCTGCAGCTCGGTCG TGCC
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 0. dongliangensis2 AAGATGTTACAGCACCTGGACAACG TGATCGACATCATGAACTGCAGCTCGGTCG TGCC
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 0. daqikongensis3 AAGATGTTACAGCACCTGGACAACG TGATCGACATCATGAACTGCAGCTCGGTCG TGCC

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 0. daqikongensis2 CGCTACCACAGCATCATG ACCACGAGACGCGCGG TGGCCATCATCGCGG TGGTTTGGCTT
 0. daqikongensis3 CGCTACCACAGCATCATG ACCACGAGACGCGCGG TGGCCATCATCGCGG TGGTTTGGCTT

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 0. daqikongensis3 TTGATCTTGGCGCAG TTCACTCCAGGCGCATCAGGGCTCTCCACAAGAGCCACCGGCAG

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 52

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 0. daqikongensis3 GCCACCAGCATGAAGGGAGCTATCACTCTGACCATCCCTGCTCGGGGTTTTATCATCTGT

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 0. daqikongensis3 TGGGGGCCATTCTTTCTCCACCTCATTCTCATACTCATACTCATCTGTCCCACAAACCCG

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 0. dongliangensis1 AACTGCATGTGTTACTTTAAACCACITTAACCTCTTTCTGATCCTCATCATATGCAACTCG
 0. dongliangensis2 AACTGCATGTGTTACTTTAAACCACITTAACCTCTTTCTGATCCTCATCATATGCAACTCG
 0. shuilongensis1 GACTGCATGTGTTACTTTAAACCACITTAACCTCTTTCTGATCCTCATCATATGCAACTCG
 0. shuilongensis2 GACTGCATGTGTTACTTTAAACCACITTAACCTCTTTCTGATCCTCATCATATGCAACTCG
 0. daqikongensis1 GACTGCATGTGTTACTTTAAACCACITTT---C-----TGATCCTCATCATATGCAACTCG
 0. daqikongensis2 GACTGCATGTGTTACTTTAAACCACITTT---C-----TGATCCTCATCATATGCAACTCG
 0. daqikongensis3 GACTGCATGTGTTACTTTAAACCACITTT---C-----TGATCCTCATCATATGCAACTCG
 ***** * *****

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 0. jiarongensis2 CTCATAGATCCTCTCATTAAAGCGTAACCGCAGCCAGGAGCTGCGCAAGACTCTCAAGGAA
 0. dongliangensis1 CTCATAGATCCTCTCATTAAAGCGTAACCGCAGCCAGGAGCTGCGCAAGACTCTCAAGGAA
 0. dongliangensis2 CTCATAGATCCTCTCATTAAAGCGTAACCGCAGCCAGGAGCTGCGCAAGACTCTCAAGGAA
 0. shuilongensis1 CTCATAGATCCTCTCATTAAAGCGTAACCGCAGCCAGGAGCTGCGCAAGACTCTCAAGGAA
 0. shuilongensis2 CTCATAGATCCTCTCATTAAAGCGTAACCGCAGCCAGGAGCTGCGCAAGACTCTCAAGGAA
 0. daqikongensis1 CTCATAGATCCTCTCATTAAAGCGTAACCGCAGCCAGGAGCTGCGCAAGACTCTCAAGGAA
 0. daqikongensis2 CTCATAGATCCTCTCATTAAAGCGTAACCGCAGCCAGGAGCTGCGCAAGACTCTCAAGGAA
 0. daqikongensis3 CTCATAGATCCTCTCATTAAAGCGTAACCGCAGCCAGGAGCTGCGCAAGACTCTCAAGGAA

0. jiarongensis1 ATAGTCTTCGTTCGTGGTGCTTTGTAATGTGA
 0. jiarongensis2 ATAGTCTTCGTTCGTGGTGCTTTGTAATGTGA
 0. dongliangensis1 ATAGTCTTCGTTCGTGGTGCTTTGTAATGTGA
 0. dongliangensis2 ATAGTCTTCGTTCGTGGTGCTTTGTAATGTGA
 0. shuilongensis1 ATAGTCTTCGTTCGTGGTGCTTTGTAATGTGA
 0. shuilongensis2 ATAGTCTTCGTTCGTGGTGCTTTGTAATGTGA
 0. daqikongensis1 ATAGTCTTCGTTCGTGGTGCTTTGTAATGTGA
 0. daqikongensis2 ATAGTCTTCGTTCGTGGTGCTTTGTAATGTGA
 0. daqikongensis3 ATAGTCTTCGTTCGTGGTGCTTTGTAATGTGA

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57 **Supplementary Fig. S2.** BUSCO assessment of *O. shuilongensis* transcriptome assembly.

