A

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gipc1Y      ATGCCTCTGGGTCTGGGAAGAAGGAAGAAGGCGTCCCCCTTGGTGGAGAATGAGGAAGCG 60
gipc1X      ATGCCTCTGGGTCTGGGAAGAAGGAAGAAGGCGTCCCCCTTGGTGGAGAATGAGGAAGCG 60
            ************************************************************

gipc1Y      GAGCCCATCCGCGGTGGTCTCAACATGCCGGGTATGGAGGGCTTGGATGGAGGAGTCGCT 120
gipc1X      GAGCCCATCCGCGGTGGTCTCAACTTGCCGGGTATGGAGGGCTTGGATGGAGGAGTCGCT 120
            ********************** ***********************************

gipc1Y      GGGGAGGCTGCAGGGTCTGACGGTCTTCCTCCCCCACCAAACAACATGAGACCCCGGCTG 180
gipc1X      GGGGAGGCTGCAGGGTCTGACGGTCTTCCTCCCCCACCAAACAACATGAGACCCCGGCTG 180
            ************************************************************

gipc1Y      ATTTTCCACACCCAACTGGCTCACGGCAGCCCCACAGGCCGCATTGAGGGCTTTAGCAAT 240
gipc1X      ATTTTCCACACCCAACTGGCTCACGGCAGCCCCACAGGCCGCATTGAGGGCTTTAGCAAT 240
            ************************************************************

gipc1Y      GTGCGAGAGCTCTATGCCAAAATTGGAGAGGCCTTTGGCATCCCAGCATCTGAGGTTATG 300
gipc1X      GTGCGAGAGCTCTATGCCAAAATTGGAGAGGCCTTTGGCATCCCAGCATCTGAGGTTATG 300
            ************************************************************

gipc1Y      TTTTGCACGCTGAACACTCACAAGGTGGACATGGATAAACTTTTAGGGGGACAGATTGGG 360
gipc1X      TTTTGCACGCTGAACACTCACAAGGTGGACATGGATAAACTTTTAGGGGGACAGATTGGG 360
            ************************************************************

gipc1Y      CTGGAGGACTTCATTTTTGCCCACATTAAAGGCCAGAAGAAGGAAATAGAAATCTTCAAA 420
gipc1X      CTGGAGGACTTCATTTTTGCCCACATTAAAGGCCAGAAGAAGGAAATAGAAATCTTCAAA 420
            ************************************************************

gipc1Y      GGAGAAGATGCTTTAGGACTGACAATCACCGACAACGGAGCAGGTTATGCTTTCATCAAG 480
gipc1X      GGAGAAGATGCTTTAGGACTGACAATCACCGACAACGGAGCAGGTTATGCTTTCATCAAG 480
            ************************************************************

gipc1Y      AGGATCCGGGAGGGGAGCATCATCCACCAAATCCAGGTCATTAACGTTGGTGACATGATC 540
gipc1X      AGGATCCGGGAGGGGAGCATCATCCACCAAATCCAGGTCATTAACGTTGGTGACATGATC 540
            ************************************************************

gipc1Y      GAGTCCATTAACGGCCATCGCCTCATTGGCTGTCGACACTACGAAGTTGCCAAAATGCTG 600
gipc1X      GAGTCCATTAACGGCCATCGCCTCATTGGCTGTCGACACTACGAAGTTGCCAAAATGCTG 600
            ************************************************************

gipc1Y      AAGGAGCTTTCTAAGGGGAAAATGTTCACCATCAAGCTTGTGGAGCCCCTCAAAGCTTTT 660
gipc1X      AAGGAGCTTCCTAAGGGGAAAATGTTCACCATCAAGCTTGTGGAGCCCCTCAAAGCTTTT 660
            ********* ************************************************

gipc1Y      GATATGATTGGTCAGAGGTCGTCAGGCTCCAGGTCGGGCTCAGCGGTCCAGCTCGGGACG 720
gipc1X      GATATGATTGGTCAGAGGTCGTCAGGCTCCAGGTCGGGCTCGGGGTCCAGCTCGGGACG 720
            ************************************** * ****************

gipc1Y      GGCAGAGGGACCCTTCGTCTGCGCTCTAAAGGTCTCGCCACCGTGGACGAGCTGCCTTCT 780
gipc1X      GGCAGAGGGACCCTTCGTCTGCGCTCTAAAGGTCCCGCCACCGTGGAGGAGCTGCCTTCT 780
            ********************************** ************ ************

gipc1Y      GCATTTGAGGAAAAAGCGATTGAGAAGGTGGATGATTTGCTAGAGAGCTACATGGGCATC 840
gipc1X      GCATTTGAGGAAAAAGCGATTGAGAAGGTGGATGATTTGCTAGAGAGCTACATGGGCATC 840
            ************************************************************

gipc1Y      AGAGACAGCGAACTGGCCGCCACTATGGTGGAGCTGGGCAAAGACAAGAAGAACCCAGAC 900
gipc1X      AGAGACAGCGAACTGGCCGCCACTATGGTGGAGCTGGGCAAAGACAAGAAGAACCCAGAC 900
            ************************************************************

gipc1Y      GAGTTTGCTGAAGCTTTGGATGAGACTCTGGGAGACTTCGCCTTCCCCGACGAGTTTGTT 960
gipc1X      GAGTTTGCTGAAGCTTTGGATGAGACTCTGGGAGACTTCGCCTTCCCCGACGAGTTTGTT 960
            ************************************************************

gipc1Y      TTCGACGTCTGGGGCGCCATCGGTGACGCGAAGGTTGGACGTGTGTAA 1008
gipc1X      TTCGACGTCTGGGGCGCCATCGGTGACGCGAAGGTTGGACGTGTGTAA 1008
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B

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gipc1Y      MPLGLGRRKKASPLVENEEAEPIRGGLNMPGMEGLDGGVAGEAAGSDGLPPPPNNMRPRL 60
gipc1X      MPLGLGRRKKASPLVENEEAEPIRGGLNLPGMEGLDGGVAGEAAGSDGLPPPPNNMRPRL 60
            ****************************:******************************

gipc1Y      IFHTQLAHGSPTGRIEGFSNVRELYAKIGEAFGIPASEVMFCTLNTHKVDMDKLLGGQIG 120
gipc1X      IFHTQLAHGSPTGRIEGFSNVRELYAKIGEAFGIPASEVMFCTLNTHKVDMDKLLGGQIG 120
            ************************************************************

gipc1Y      LEDFIFAHIKGQKKEIEIFKGEDALGLTITDNGAGYAFIKRIREGSIIHQIQVINVGDMI 180
gipc1X      LEDFIFAHIKGQKKEIEIFKGEDALGLTITDNGAGYAFIKRIREGSIIHQIQVINVGDMI 180
            *********************************************************

gipc1Y      ESINGHRLIGCRHYEVAKMLKELSKGKMFTIKLVEPLKAFDMIGQRSSGSRSGSAVQLGT 240
gipc1X      ESINGHRLIGCRHYEVAKMLKELPKGKMFTIKLVEPLKAFDMIGQRSSGSRSGSGVQLGT 240
            ********************** ************************.*****

gipc1Y      GRGTLRLRSKGLATVDELPSAFEEKAIEKVDDLLESYMGIRDSELAATMVELGKDKKNPD 300
gipc1X      GRGTLRLRSKGPATVEELPSAFEEKAIEKVDDLLESYMGIRDSELAATMVELGKDKKNPD 300
            *********** ***:********************************************

gipc1Y      EFAEALDETLGDFAFPDEFVFDVWGAIGDAKVGRV 335
gipc1X      EFAEALDETLGDFAFPDEFVFDVWGAIGDAKVGRV 335
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C

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sox9bX      ATGAATCTCCTCGACCCTTACCTGAAGATGACAGAAGAACAGGAGAAATGTCATTCAGAC 60
sox9bY      ATGAATCTCCTCGACCCTTACCTGAAGATGACAGAAGAACAGGAGAAATGTCATTCAGAC 60
            ************************************************************

sox9bX      GCTCCGAGCCCCAGCATGTCTGAAGACTCAGCGGGCTCGCCGTGCCCGTCCGGCTCCGGT 120
sox9bY      GCTCCGAGCCCCAGCATGTCTGAAGACTCAGCGGGCTCGCCGTGCCCGTCCGGCTCCGGT 120
            ************************************************************

sox9bX      TCGGACACCGAGAACACCCGGCCGTCCGACAACCACCTCCTCAGGGGACCGGACTACAAG 180
sox9bY      TCGGACACCGAGAACACCCGGCCGTCCGACAACTACCTCCTCAGGGGACCGGACTACAAG 180
            ********************************* ************************

sox9bX      AAGGAAGGCGAGGAAGAGAAGTTCCCGGTGTGCATCAGAGATGCGGTGTCCCAGGTGCTG 240
sox9bY      AAGGAAGGCGAGGAAGAGAAGTTCCCGGTGTGCATCAGAGATGCGGTGTCCCAGGTGCTG 240
            ************************************************************

sox9bX      AAGGGCTATGACTGGACGCTCGTACCCATGCCGGTGCGCGTCAACGGCTCCAGCAAGAGC 300
sox9bY      AAGGGCTATGACTGGACGCTCGTACCCATGCCGGTGCGCGTCAACGGCTCCAGCAAGAGC 300
            ************************************************************

sox9bX      AAACCACACGTTAAGAGACCCATGAACGCCTTCATGGTTTGGGCTCAGGCGGCGCGGAGG 360
sox9bY      AAACCACACGTTAAGAGACCCATGAACGCCTTCATGGTTTGGGCTCAGGCGGCGCGGAGG 360
            ************************************************************

sox9bX      AAGCTGGCCGATCAGTATCCGCATCTGCACAACGCAGAACTCAGCAAAACCCTGGGAAAA 420
sox9bY      AAGTTGGCCGATCAGTATCCGCATCTGCACAACGCAGAACTCAGCAAAACCCTGGGAAAA 420
            *** ********************************************************

sox9bX      CTTTGGAGGCTTCTCAATGAGGTGGAGAAGCGCCCGTTTGTGGAGGAAGCTGAACGCCTG 480
sox9bY      CTTTGGAGGCTTCTCAATGAGGTGGAGAAGCGCCCGTTTGTGGAGGAAGCTGAACGCCTG 480
            ************************************************************

sox9bX      AGAGTGCAGCACAAGAAGGATCACCCCGACTACAAATATCAACCGAGGCGGAGGAAATCT 540
sox9bY      AGAGTGCAGCACAAGAAGGATCACCCCGACTATAAATATCAACCGAGGCGGAGGAAATCT 540
            ********************************* ************************

sox9bX      GTTAAGAATGGGCAAAATGAATCCGAGGATGGCGAACAGACGCACATCTCTCCGAACGCT 600
sox9bY      GTTAAGAATGGGCAAAATGAATCCGAGGATGGCGAACAGACGCACATCTCTCCGAACGCT 600
            ************************************************************
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sox9bX      ATATTCAAGGCGCTGCAGCAAGCAGACTCTCCTGCGTCCAGCATGGGCGAGGTGCACTCT 660
sox9bY      ATATTCAAGGCGCTGCAGCAAGCAGACTCTCCTGCGTCCAGCATGGGCGAGGTGCACTCT 660
            ************************************************************

sox9bX      CCGGGAGAACATTCGGGTCAGTCACAGGGACCACCAACACCCCCGACAACCCCAAAGACA 720
sox9bY      CCGGGAGAACATTCTGGTCAGTCACAGGGACCACCAACACCCCCGACAACCCCAAAGACA 720
            ************** ***********************************************

sox9bX      GATCTTTCCTCCAGCAAAGCTGACCTGAAGCGTGAGGGCCGCCCCATTCAAGAGGGCAGC 780
sox9bY      GATCTTTCCTCCAGCAAAGCTGACCTGAAGCGTGAGGGCCGCCCCATTCAAGAGGGCAGC 780
            ************************************************************

sox9bX      AGTCGGCAGCTCAACATAGACTTTGGAGCTGTGGACATTGGTGAGCTTAGCAGCGAAGTC 840
sox9bY      AGTCGGCAGCTCAACATAGACTTTGGAGCTGTGGACATTGGTGAGCTTAGCTGCGAAGTC 840
            ************************************************** ********

sox9bX      ATCTCCAACATCGGGAGCTTTGATGTTGATGAGTTCGACCAGTACCTGCCACCTCACAGC 900
sox9bY      ATCTCCAACATCGGGAGCTTTGATGTTGATGAGTTCGACCAGTACCTGCCACCTCACAGC 900
            ************************************************************

sox9bX      CACGCTGGGGTTGCTGGTCCAGCCCAGGCTGGCTACACAGGCAGCTACGGTATTAGCACC 960
sox9bY      CACGCTGGGGTTGCTGGTCCAGCCCAGGCTGGCTACACAGGCAGCTACGGTATTAGCACC 960
            ************************************************************

sox9bX      TCCTCAGTCAGTCAGGGAGCCGGTGTGGGAGCTCATGCTTGGATGTCCAAGCAGCAGCAG 1020
sox9bY      TCCTCAGTCAGTCAGGGAGCCAGTGTGGGAGCTCATGCTTGGATGTCCAAGCAGCAGCAG 1020
            ********************* ************************************

sox9bX      CAGCAGCATACTCTGACCAACCTTGGTGGAGCAGGAGAGCAAGGTCAACAGGGCCAGCAG 1080
sox9bY      CAGCAGCATACTCTGACCACCCTTGGTGGAGCAGCAGAGCAAGGTCAACAGGGCCAGCAG 1080
            ******************* ************** *************************

sox9bX      AGAACCACCCAGATCAAGACGGAGCAGCTCAGCCCGAGCCACTACAGTGACCAACAGGGA 1140
sox9bY      AGAACCACCCAGATCAAGACGGAGCAGCTCAGCCCGAGCCACTACAGTGACCAACAGGGA 1140
            ************************************************************

sox9bX      TCCCCGCAGCACATCACCTATGGCTCATTCAACCTACAGCACTACAGCCCCTCTTCTTAT 1200
sox9bY      TCCCCGCAGCACATCACCTATGGCTCATTCAACTTACAGCACTACAGCCCCTCTTCTTAT 1200
            ********************************* ************************

sox9bX      CCGTCCATCACAAGAGCACAATATGACTATTCAGAACACCAGAGCAGTGCCAACTCTTAC 1260
sox9bY      CCGTCCATCACAAGAGCACAATATGACTATTCAGAACACCAGAGCAGTGCCAACTCTTAC 1260
            ************************************************************

sox9bX      TACAGCCACGCAGCTGGCCAAGGTTCCAGCCTGTACTCCACCTTCAGCTACATGAGCCCC 1320
sox9bY      TACAGCCACGCAGCTGGCCAAGGTTCCAGCCTGTACTCCACCTTCAGCTACATGAGCCCC 1320
            ************************************************************

sox9bX      AGCCAGAGGCCGATGTACACCCCAATAGCCGACAGCACTGGGGTGCCCTCTGTGCCGCAG 1380
sox9bY      AGCCAGAGGCCGATGTACACCCCAATAGCCGACAGCACTGGGGTGCCCTCTGTGCCGCAG 1380
            ************************************************************

sox9bX      ACCCACAGTCCACAGCACTGGGAGCAGCAGCCGATTTACACACAACTGTCCAGGCCCTGA 1440
sox9bY      ACCCACAGTCCACAGTACTGGGAGCAGCAGCCGATTTACACACAACTGTCCAGGCCCTGA 1440
            *************** ********************************************
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D

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sox9bX      MNLLDPYLKMTEEQEKCHSDAPSPSMSEDSAGSPCPSGSGSDTENTRPSDNHLLRGPDYK 60
sox9bY      MNLLDPYLKMTEEQEKCHSDAPSPSMSEDSAGSPCPSGSGSDTENTRPSDNYLLRGPDYK 60
            ************************************************:********

sox9bX      KEGEEEKFPVCIRDAVSQVLKGYDWTLVPMPVRVNGSSKSKPHVKRPMNAFMVWAQAARR 120
sox9bY      KEGEEEKFPVCIRDAVSQVLKGYDWTLVPMPVRVNGSSKSKPHVKRPMNAFMVWAQAARR 120
            ************************************************************

sox9bX      KLADQYPHLHNAELSKTLGKLWRLLNEVEKRPFVEEAERLRVQHKKDHPDYKYQPRRRKS 180
sox9bY      KLADQYPHLHNAELSKTLGKLWRLLNEVEKRPFVEEAERLRVQHKKDHPDYKYQPRRRKS 180
            ************************************************************
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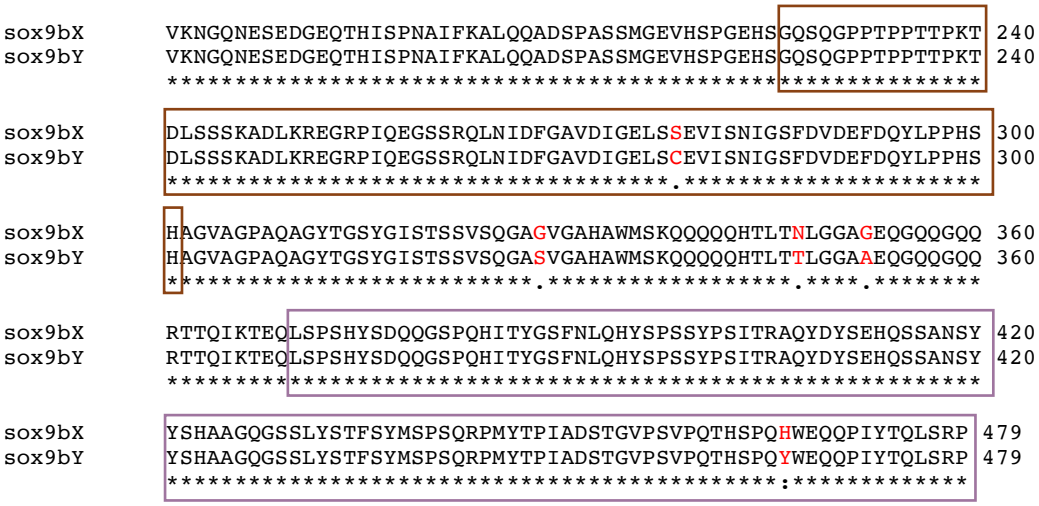

Figure S4 Alignments of male *G. holbrooki gipc1* and *sox9b* alleles.

Alignment of (A) *gipc1* ORF and (B) predicted protein sequences and (C) *sox9b* ORF and (D) putative protein sequences from the X and Y chromosome. The sequences were aligned with Clustal Omega. (B) Orange, GH1 domain; light blue, PDZ domain; red, GH2 domain. (D) Green, DIM domain; dark blue, HMG domain; brown, K2 domain; violet, TA domain.