

**Table S1.** NCBI Accession Numbers of the cds used for the phylogeny.

	<b>hoxa1a</b>	<b>hoxa3a</b>	<b>hoxa4a</b>	<b>hoxa5a</b>	<b>hoxa9a</b>	<b>hoxa11a</b>	<b>hoxa13a</b>	<b>evx</b>
<i>Solea senegalensis</i>	XM_044053073.1	XM_044053071.1	XM_044053076.1	XM_044053074.1	XM_044052424.1	XM_044052423.1	XM_044052421.1	XM_044052420.1
<i>Hipoglossus hippoglossus</i>	XM_034599294.1	XM_034599289.1	XM_034599297.1	XM_034599295.1	XM_034600629.1	XM_034600489.1	XM_034600488.1	XM_034600485.1
<i>Paralichthys olivaceus</i>	XM_020090485.1	XM_020090478.1	XM_020090490.1	XM_020090487.1	XM_020090489.1	XM_020090488.1	XM_020090486.1	XM_020090482.1
<i>Scophthalmus maximus</i>	XM_035621516.2	XM_035621509.2	XM_035621521.2	XM_035621518.2	XM_035621520.2	XM_035621519.2	XM_035621517.2	XM_035620695.2
<i>Cynoglossus semilaevis</i>	XM_008331460.3	XM_008331457.3	XM_008331455.3	XM_008331454.3	XM_008331453.3	XM_017040992.2	XM_035621517.2	XM_008331448.3
<i>Echeneis naucrates</i>	XM_029513552.1	XM_029513549.1	XM_029514003.1	XM_029513665.1	XM_029513872.1	XM_029513686.1	XM_029514409.1	XM_029514683.1
<i>Seriola lalandi</i>	XM_023431029.1	XM_023431021.1	XM_023431027.1	XM_023431026.1	XM_023431047.1	XM_023431046.1	XM_023431101.1	XM_023431102.1
<i>Seriola dumerili</i>	XM_022747292.1	XM_022746931.1	XM_022747273.1	XM_022746996.1	XM_022747200.1	XM_022747381.1	XM_022747507.1	XM_022747641.1
<i>Oreochromis niloticus</i>	XM_005453829.4	XM_025902218.1	XM_005453825.4	XM_003448866.5	XM_003448867.5	XM_003448869.5	XM_003448870.5	XM_019350306.2
<i>Gasterosteus aculeatus</i>	XM_040188613.1	XM_040188611.1	XM_040188616.1	XM_040188614.1	XM_040189069.1	XM_040189494.1	XM_040189495.1	XM_040187830.1
<i>Sparus aurata</i>	XM_030412081.1	XM_030412077.1	XM_030412083.1	XM_030412082.1	XM_030411218.1	XM_030411377.1	XM_030411402.1	XM_030411493.1
<i>Danio Rerio</i>	XM_017352263.2	NM_131534.1	NM_131535.1	NM_131540.1	NM_131532.2	NM_131544.1	NM_001085494.1	NM_131249.2
<i>Lepisosteus oculatus</i>	XM_006636214.2	XM_015357856.1	XM_006636215.2	XM_040121442.1	XM_006636060.2	XM_006636062.2	XM_006636063.2	XM_006636064.2
<i>Xiphias gladius</i>	XM_040121762.1	XM_040121211.1	XM_040121212.1	XM_040121442.1	XM_040121443.1	XM_040122188.1	XM_040122187.1	XM_040122175.1
<i>Lates calcarifer</i>	XM_018667274.2	XM_018667166.2	XM_018667365.2	XM_018667300.2	XM_018667353.2	XM_018667321.2	XM_018667311.2	XM_051066022.1
<i>Toxotes jaculatrix</i>	XM_041052839.1	XM_041052832.1	XM_041052835.1	XM_041052834.1	XM_041053228.1	XM_041053999.1	XM_041053560.1	XM_041053805.1
<i>Oryzias latipes</i>	XM_004073855.3	XM_011480872.3	XM_011480868.3	AB207979.1	NM_001104666.1	XM_004073858.3	XM_004073861.4	XM_004073862.4
<i>Takifugu rubripes</i>	XM_011609092.2	XM_029844659.1	XM_011609093.2	XM_029845496.1	XM_011609098.2	XM_003968984.2	XM_003968986.3	XM_003968987.2
<i>Anguilla anguilla</i>	XM_035430802.1	XM_035429976.1	XM_035429982.1	XM_035429980.1	XM_035427867.1	XM_035427866.1	XM_035428605.1	XM_035428604.1
<i>Latimeria chalumnae</i>	XM_005993081.2	XM_014486712.1	XM_005993086.1	XM_005993085.1	XM_005993082.2	XM_005993088.1	XM_005993090.1	XM_005993091.1
<i>Amblyraya radiata</i>	XM_033047630.1	XM_033039426.1	XM_033047665.1	XM_033047653.1	XM_033047583.1	XM_033047552.1	XM_033047538.1	XM_033047535.1
<i>Rhincodon typus</i>	XM_020526887.2	XM_048611197.1	XM_020526900.2	XM_020526899.2	XM_048611312.1	XM_020526889.2	XM_020526886.2	XM_020536619.2
<i>Callorhinchus milii</i>	XM_007900497.2	XM_007900492.2	XM_007900493.2	XM_007900494.2	XM_007900488.2	XM_007900484.2	XM_007900483.2	XM_007900540.1

	<b>hoxa2b</b>	<b>hoxa9b</b>	<b>hoxa10b</b>	<b>hoxa11b</b>	<b>hoxa13b</b>
<i>Solea senegalensis</i>	XM_044033439.1	XM_044034539.1	XM_044033386.1	XM_044034522.1	XM_044034543.1
<i>Hipoglossus hippoglossus</i>	XM_034610224.1	XM_034610226.1	XM_034610221.1	XM_034610225.1	XM_034610236.1
<i>Paralichthys olivaceus</i>	XM_020107684.1	XM_020092794.1	XM_020092572.1	XM_020092579.1	XM_020092802.1
<i>Scophthalmus maximus</i>	XM_035636648.2	XM_035636686.2	XM_035636662.2	XM_035636674.2	XM_035629046.2
<i>Cynoglossus semilaevis</i>	XM_008323392.3	XM_008323390.2	XM_008323389.2	XM_008323388.3	XM_008323386.3
<i>Echeneis naucrates</i>	XM_029504329.1	XM_029504881.1	XM_029504979.1	XM_029504837.1	XM_029504659.1
<i>Seriola lalandi</i>	XM_023403084.1	XM_023403097.1	XM_023403096.1	XM_023403164.1	XM_023403095.1
<i>Seriola dumerili</i>	XM_022768488.1	XM_022768490.1	XM_022768501.1	XM_022768479.1	XM_022768482.1
<i>Oreochromis niloticus</i>	XM_003454387.5	XM_003454385.5	XM_003454384.5	XM_013277030.3	XM_003454381.5
<i>Gasterosteus aculeatus</i>	XM_040165939.1	XM_040166346.1	XM_040166343.1	XM_040166345.1	XM_040164158.1
<i>Sparus aurata</i>	XM_030392801.1	XM_030394498.1	XM_030392736.1	XM_030392737.1	XM_030394543.1
<i>Danio Rerio</i>	NM_131106.1	XM_005157968.4	XM_005157954.4	NM_131147.1	NM_131194.2
<i>Lepisosteus oculatus</i>	XM_006636056.2	XM_006636060.2	XM_006636061.2	XM_006636062.2	XM_006636063.2
<i>Xiphias gladius</i>	XM_040118965.1	XM_040118330.1	XM_040118332.1	XM_040116839.1	XM_040118290.1
<i>Lates calcarifer</i>	XM_018680462.2	XM_018680450.2	XM_018688598.2	XM_018688590.2	XM_018688576.2
<i>Toxotes jaculatrix</i>	XM_041044579.1	XM_041044823.1	XM_041044841.1	XM_041044815.1	XM_041044785.1
<i>Oryzias latipes</i>	XM_004077830.3	NM_001104665.1	XM_004077829.3	XM_004077828.4	XM_004077827.4
<i>Takifugu rubripes</i>	XM_003966101.3	XM_029838911.1	XM_003966103.3	XM_003966104.2	XM_029839402.1
<i>Anguilla anguilla</i>	XM_035409817.1	XM_035400461.1	XM_035400203.1	XM_035400328.1	XM_035387260.1
<i>Latimeria chalumnae</i>	XM_005993080.2	XM_005993082.2	XM_005993087.2	XM_005993088.1	XM_005993090.1
<i>Amblyraja radiata</i>	XM_033039426.1	XM_033047583.1	XM_033047542.1	XM_033047552.1	XM_033047538.1
<i>Rhincodon typus</i>	XM_020526898.2	XM_048611312.1	XM_048611236.1	XM_020526889.2	XM_020526886.2
<i>Callorhinchus milii</i>	XM_007900496.2	XM_007900488.2	XM_007900485.2	XM_007900484.2	XM_007900483.2

	<b>hoxb1a</b>	<b>hoxb3a</b>	<b>hoxb5a</b>	<b>hoxb6a</b>	<b>hoxb9a</b>	<b>hoxb13a</b>
<i>Solea senegalensis</i>	XM_044051227.1	XM_044050658.1	XM_044050659.1	XM_044050661.1	XM_044051907.1	XM_044051185.1
<i>Hipoglossus hippoglossus</i>	XM_034594345.1	XM_034594317.1	XM_034594349.1	XM_034594353.1	XM_034594356.1	XM_034594347.1
<i>Paralichthys olivaceus</i>	XM_020103654.1	XM_020103679.1	XM_020103682.1	XM_020103683.1	XM_020103664.1	XM_020103651.1
<i>Scophthalmus maximus</i>	XM_035616535.2	XM_035616288.2	XM_035616290.2	XM_035616291.2	XM_035616466.2	XM_035615299.1
<i>Cynoglossus semilaevis</i>	XM_025064707.1	XM_017040668.2	XM_025064542.1	XM_008330559.3	XM_025064731.1	XM_008330561.3
<i>Echeneis naucrates</i>	XM_029508103.1	XM_029507856.1	XM_029507661.1	XM_029507662.1	XM_029507920.1	XM_029508846.1
<i>Seriola lalandi</i>	XM_023426183.1	XM_023426164.1	XM_023426170.1	XM_023426171.1	XM_023426230.1	XM_023426222.1
<i>Seriola dumerili</i>	XM_022753730.1	XM_022753675.1	XM_022753682.1	XM_022753683.1	XM_022753704.1	XM_022753723.1
<i>Oreochromis niloticus</i>	XM_019358339.2	XM_019358338.2	XM_003446381.5	XM_019358340.2	XM_003446378.5	XM_005468651.4
<i>Gasterosteus aculeatus</i>	XM_040191944.1	XM_040190248.1	XM_040190250.1	XM_040190252.1	XM_040191827.1	XM_040189974.1
<i>Sparus aurata</i>	XM_030408440.1	XM_030406674.1	XM_030406675.1	XM_030406676.1	XM_030406487.1	XM_030406722.1
<i>Danio Rerio</i>	NM_131115.2	NM_131117.3	NM_131101.2	NM_131119.1	NM_131121.2	NM_001044912.1
<i>Lepisosteus oculatus</i>	XM_006638354.2	XM_015362327.1	XM_006638313.2	XM_015362336.1	XM_006638318.2	XM_006638319.2
<i>Xiphias gladius</i>	XM_040116601.1	XM_040124198.1	XM_040124199.1	XM_040124200.1	XM_040122740.1	XM_040123441.1
<i>Lates calcarifer</i>	XM_018698423.1	XM_018698427.2	XM_018698431.2	XM_018698432.2	XM_018698466.2	XM_018698421.2
<i>Toxotes jaculatrix</i>	XM_041063124.1	XM_041063340.1	XM_041063218.1	XM_041063219.1	XM_041063546.1	XM_041062950.1
<i>Oryzias latipes</i>	XM_011478648.3	XM_023957835.1	XM_004072012.4	XM_023957838.1	XM_004071881.4	XM_023957823.1
<i>Takifugu rubripes</i>	XM_003964295.2	XM_029836636.1	XM_003964258.3	XM_003964257.3	XM_011603555.2	XM_003964255.2
<i>Anguila anguila</i>	XM_035397161.1	XM_035403788.1	XM_035397164.1	XM_035397169.1	XM_035397165.1	XM_035397162.1
<i>Latimeria chalumnae</i>	XM_005990053.1	XM_005990050.2	XM_005990046.2	XM_005990045.2	XM_005990041.2	XM_005990054.1
<i>Amblyraya radiata</i>	XM_033034952.1	XM_033034945.1	XM_033034953.1	XM_033034958.1	XM_033034954.1	XM_033034951.1
<i>Rhincodon typus</i>	XM_020531408.2	XM_048614599.1	XM_020531412.2	XM_020531409.2	XM_020531413.2	XM_020531396.2
<i>Callorhinchus milii</i>	XM_007904378.2	XM_007904364.2	XM_007904370.2	XM_007904371.2	XM_007904375.2	XM_007904360.2

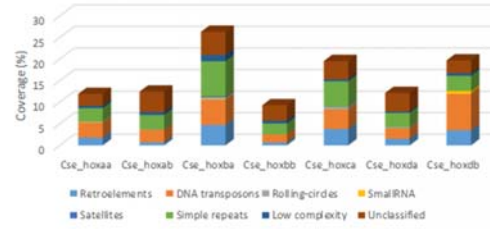
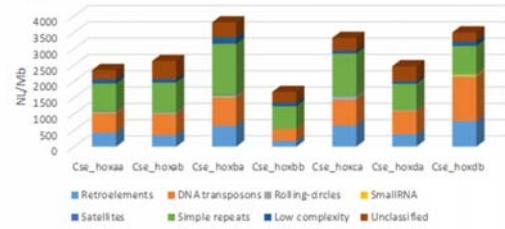
	<b>hoxb1b</b>	<b>hoxb5b</b>
<i>Solea senegalensis</i>	XM_044014574.1	XM_044014573.1
<i>Hippoglossus hippoglossus</i>	XM_034570616.1	XM_034570614.1
<i>Paralichthys olivaceus</i>	XM_020106567.1	XM_020106568.1
<i>Scophthalmus maximus</i>	XM_035612398.2	XM_035612401.2
<i>Cynoglossus semilaevis</i>	XM_008314492.3	XM_008314452.3
<i>Echeneis naucrates</i>	XM_029527845.1	XM_029527121.1
<i>Seriola lalandi</i>	XM_023406840.1	XM_023406839.1
<i>Seriola dumerili</i>	XM_022743186.1	XM_022742604.1
<i>Oreochromis niloticus</i>	XM_003448649.5	XM_003448647.5
<i>Gasterosteus aculeatus</i>	XM_040176913.1	XM_040176912.1
<i>Sparus aurata</i>	XM_030399848.1	XM_030399847.1
<i>Danio Rerio</i>	NM_131142.2	NM_131537.3
<i>Lepisosteus oculatus</i>	XM_006638354.2	XM_006638313.2
<i>Xiphias gladius</i>	XM_040134617.1	XM_040135901.1
<i>Lates calcarifer</i>	XM_018689446.2	XM_018689447.2
<i>Toxotes jaculatrix</i>	XM_041029554.1	XM_041029556.1
<i>Oryzias latipes</i>	XM_004080650.4	XM_004080652.4
<i>Takifugu rubripes</i>	XM_003961127.3	XM_003961079.3
<i>Anguilla anguilla</i>	XM_035403800.1	XM_035403807.1
<i>Latimeria chalumnae</i>	XM_005990053.1	XM_005990046.2
<i>Amblyraya radiata</i>	XM_033034952.1	XM_033034953.1
<i>Rhincodon typus</i>	XM_020531408.2	XM_020531412.2
<i>Callorhynchus milii</i>	XM_007904378.2	XM_007904370.2

	hoxc5a	hoxc6a	hoxc8a	hoxc9a	hoxc10a	hoxc11a	hoxc12a	hoxc13a
<i>Solea senegalensis</i>	XM_044038514.1	XM_044038513.1	XM_044038511.1	XM_044038510.1	XM_044038503.1	XM_044037399.1	XM_044037415.1	XM_044038825.1
<i>Hipoglossus hippoglossus</i>	XM_034590502.1	XM_034590500.1	XM_034590703.1	XM_034590702.1	XM_034591162.1	XM_034590701.1	XM_034590360.1	XM_034590359.1
<i>Paralichthys olivaceus</i>	XM_020095981.1	XM_020095980.1	XM_020078106.1	XM_020095976.1	XM_020095968.1	XM_020095971.1	XM_020095975.1	XM_020095974.1
<i>Scophthalmus maximus</i>	XM_035643931.2	XM_035643941.2	XM_035643938.2	XM_035643937.2	XM_047330863.1	XM_035643932.2	XM_035643936.2	XM_035643934.2
<i>Cynoglossus semilaevis</i>	XM_008318907.3	XM_008318906.2	XM_008318904.2	XM_008318905.2	XM_008318903.3	XM_008318901.3	XM_008318900.3	XM_008318897.3
<i>Echeneis naucrates</i>	XM_029507229.1	XM_029507226.1	XM_029506122.1	XM_029506037.1	XM_029506665.1	XM_029506646.1	XM_029507034.1	XM_029506736.1
<i>Seriola lalandi</i>	XM_023425109.1	XM_023425108.1	XM_023425106.1	XM_023425104.1	XM_023425100.1	XM_023425095.1	XM_023425084.1	XM_023425254.1
<i>Seriola dumerili</i>	XM_022741581.1	XM_022741570.1	XM_022741538.1	XM_022741573.1	XM_022741739.1	XM_022741748.1	XM_022741805.1	XM_022741750.1
<i>Oreochromis niloticus</i>	XM_003448188.4	XM_005478041.3	XM_003448186.5	XM_003448185.5	XM_003448184.3	XM_003448182.5	XM_003448181.5	XM_004070462.4
<i>Gasterosteus aculeatus</i>	XM_040193469.1	XM_040193467.1	XM_040193465.1	XM_040193464.1	XM_040193460.1	XM_040193462.1	XM_040194476.1	XM_040194520.1
<i>Sparus aurata</i>	XM_030423192.1	XM_030423191.1	XM_030423189.1	XM_030423188.1	XM_030423184.1	XM_030422665.1	XM_030422667.1	XM_030422666.1
<i>Danio Rerio</i>	NM_131144.2	NM_131123.1	NM_001005771.1	NM_131528.3	NM_001254944.1	NM_131165.2	NM_001110759.1	NM_131543.1
<i>Lepisosteus oculatus</i>	XM_006629272.2	XM_006629271.2	XM_006629270.2	XM_006629269.2	XM_006629268.2	XM_006629267.2	XM_015344107.1	XM_006629265.2
<i>Xiphias gladius</i>	XM_040152049.1	XM_040152047.1	XM_040152045.1	XM_040152976.1	XM_040152175.1	XM_040152174.1	XM_040152177.1	XM_040152176.1
<i>Lates calcarifer</i>	XM_018665902.2	XM_018665900.2	XM_018665899.2	XM_018665898.2	XM_051071212.1	XM_018665893.2	XM_018665895.2	XM_018665892.2
<i>Toxotes jaculatrix</i>	XM_041059700.1	XM_041059688.1	XM_041059666.1	XM_041059655.1	XM_041059575.1	XM_041056775.1	XM_041058361.1	XM_041057384.1
<i>Oryzias latipes</i>	XM_004070714.4	XM_004070467.4	NM_001163250.1	NM_001201492.1	XM_020704671.2	XM_004070464.4	XM_004070463.4	XM_004070462.4
<i>Takifugu rubripes</i>	XM_011621867.2	XM_003963064.3	XM_003963065.3	XM_003963066.3	XM_003963153.2	XM_003963067.3	XM_003963069.3	XM_003963070.3
<i>Anguilla anguilla</i>	XM_035382996.1	XM_035383001.1	XM_035388349.1	XM_035383655.1	XM_035383654.1	XM_035382979.1	XM_035381351.1	XM_035382953.1
<i>Latimeria chalumnae</i>	XM_005995613.1	XM_005995612.2	XM_005995619.2	XM_005995620.1	XM_005995621.2	XM_005995623.2	XM_005995624.2	XM_005995625.2
<i>Callorhynchus milii</i>	XM_007909661.2	XM_007909660.1	XM_007909657.2	XM_007909658.1	XM_007909656.2	XM_007909653.2	XM_007909654.2	XM_007909652.2

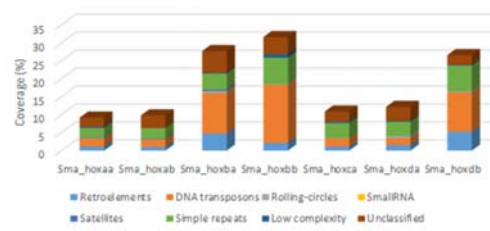
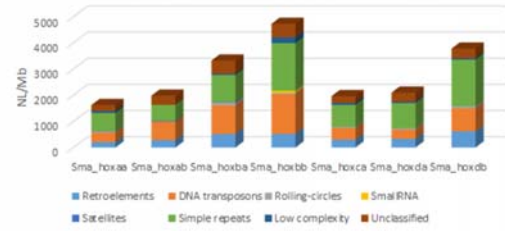
	hoxd3a	hoxd4a	hoxd10a	hoxd11a	hoxd12a	evx
<i>Solea senegalensis</i>	XM_044018128.1	XM_044018137.1	XM_044051409.1	XM_044050496.1	XM_044019062.1	XM_044019140.1
<i>Hipoglossus hippoglossus</i>	XM_034574562.1	XM_034574563.1	XM_034574122.1	XM_034574156.1	XM_034574221.1	XM_034575001.1
<i>Paralichthys olivaceus</i>	XM_020089916.1	XM_020089920.1	XM_020089917.1	XM_020089921.1	XM_020089806.1	XM_020089889.1
<i>Scophthalmus maximus</i>	XM_035603933.2	XM_035603939.2	XM_035603934.2	XM_035603935.2	XM_035603938.2	XM_035603932.2
<i>Cynoglossus semilaevis</i>	XM_017039818.2	XM_008328316.3	XM_017039824.2	XM_008328310.2	XM_017039822.2	XM_008328309.3
<i>Echeneis naucrates</i>	XM_029529979.1	XM_029529980.1	XM_029530595.1	XM_029530622.1	XM_029530946.1	XM_029492877.1
<i>Seriola lalandi</i>	XM_023405695.1	XM_023405697.1	XM_023405688.1	XM_023405689.1	XM_023405693.1	XM_023405694.1
<i>Seriola dumerili</i>	XM_022740452.1	XM_022740454.1	XM_022740964.1	XM_022740952.1	XM_022741150.1	XM_022741205.1
<i>Oreochromis niloticus</i>	XM_025904031.1	XM_005452901.4	XM_003447300.5	XM_005452905.3	XM_003447301.5	XM_003447302.5
<i>Gasterosteus aculeatus</i>	XM_040202138.1	XM_040202139.1	XM_040202511.1	XM_040202512.1	XM_040200614.1	XM_040202546.1
<i>Sparus aurata</i>	XM_030429544.1	XM_030429545.1	XM_030428626.1	XM_030428631.1	XM_030428630.1	XM_030428624.1
<i>Danio Rerio</i>	XM_021478602.1	NM_001126445.2	NM_131166.2	NM_131167.1	NM_001126486.1	NM_131232.2
<i>Lepisosteus oculatus</i>	XM_006636490.2	XM_006636491.2	XM_006636493.2	XM_006636494.2	XM_006636495.2	XM_006636497.2
<i>Xiphias gladius</i>	XM_040148524.1	XM_040148528.1	XM_040148963.1	XM_040149453.1	XM_040149452.1	XM_040149449.1
<i>Lates calcarifer</i>	XM_018675791.2	XM_018675792.2	XM_018675786.2	XM_018675790.2	XM_018675788.2	XM_018675785.2
<i>Toxotes jaculatrix</i>	XM_041057208.1	XM_041057210.1	XM_041057454.1	XM_041057425.1	XM_041057534.1	XM_041057692.1
<i>Oryzias latipes</i>	XM_011489801.3	AB232923.1	XM_004081767.4	XM_011489797.3	XM_004081928.4	XM_023951144.1
<i>Takifugu rubripes</i>	XM_029846105.1	XM_011609482.2	XM_003961830.2	XM_011609522.2	XM_003961831.2	XM_003961832.2
<i>Anguilla anguilla</i>	XM_035410365.1	XM_035410369.1	XM_035411116.1	XM_035411178.1	XM_035411313.1	XM_035411038.1
<i>Latimeria chalumnae</i>	XM_014491156.1	XM_006000588.1	XM_006000596.2	XM_006000595.2	XM_006000597.2	XM_006000598.1
<i>Amblyraya radiata</i>	XM_033023884.1	XM_033023894.1	XM_033023886.1	XM_033023889.1	XM_033023890.1	XM_033023899.1
<i>Rhincodon typus</i>	XM_048598653.1	XM_048598655.1	XM_020520271.2	XM_048598765.1	XM_020519727.2	XM_020519402.2
<i>Callorhynchus milii</i>	XM_007890055.2	XM_007890050.2	XM_007890043.2	XM_007890044.2	XM_007890045.2	XM_007890041.2

	<b>hoxd0b4</b>	<b>hoxd9b</b>
<i>Solea senegalensis</i>	XM_044045041.1	XM_044045040.1
<i>Hipoglossus hippoglossus</i>	XM_034609295.1	XM_034609296.1
<i>Paralichthys olivaceus</i>	XM_020093164.1	XM_020093177.1
<i>Scophthalmus maximus</i>	XM_035606243.2	XM_035606240.2
<i>Cynoglossus semilaevis</i>	XM_025061184.1	XM_008322471.2
<i>Echeneis naucrates</i>	XM_029521336.1	XM_029521333.1
<i>Seriola lalandi</i>	XM_023393510.1	XM_023393508.1
<i>Seriola dumerili</i>	XM_022752839.1	XM_022752836.1
<i>Oreochromis niloticus</i>	XM_003438338.5	XM_003438242.5
<i>Gasterosteus aculeatus</i>	XM_040178745.1	XM_040178742.1
<i>Sparus aurata</i>	XM_030442627.1	XM_030441114.1
<i>Lepisosteus oculatus</i>	XM_006636491.2	XM_006636577.2
<i>Xiphias gladius</i>	XM_040139702.1	XM_040139778.1
<i>Lates calcarifer</i>	XM_018693801.2	XM_018693803.2
<i>Toxotes jaculatrix</i>	XM_041049176.1	XM_041049172.1
<i>Oryzias latipes</i>	AB208019.1	AB208020.1
<i>Takifugu rubripes</i>	XM_003963848.3	XM_003963805.3
<i>Anguila anguila</i>	XM_035392667.1	XM_035392665.1
<i>Latimeria chalumnae</i>	XM_006000588.1	XM_006000594.2
<i>Amblyraya radiata</i>	XM_033047665.1	XM_033023891.1
<i>Rhincodon typus</i>	XM_048598655.1	XM_048611304.1
<i>Callorhynchus milii</i>	XM_007890050.2	XM_007890047.2

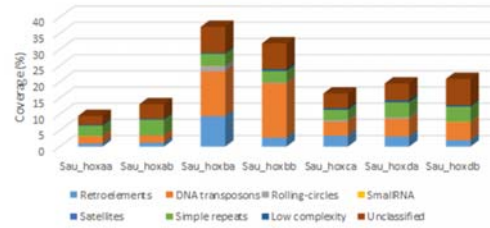
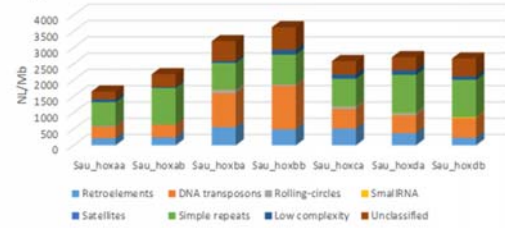
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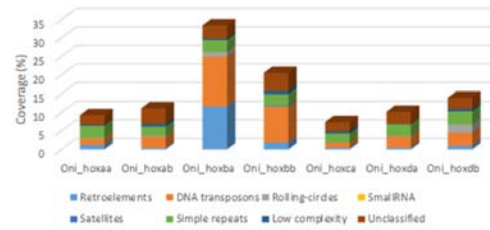
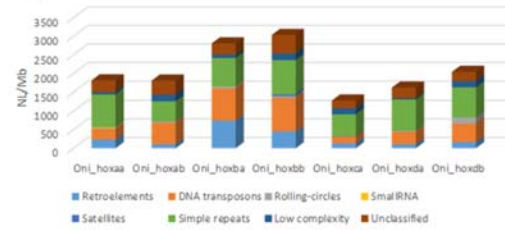
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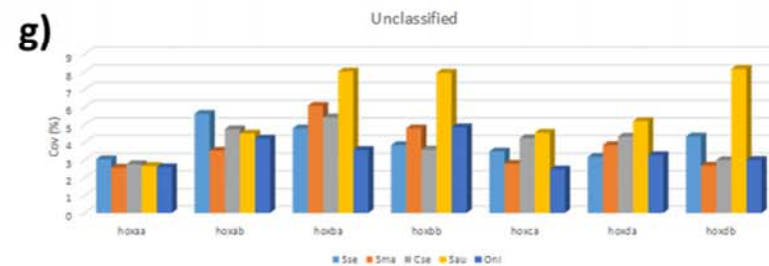
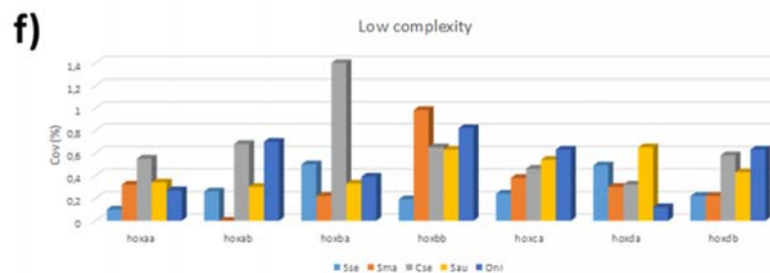
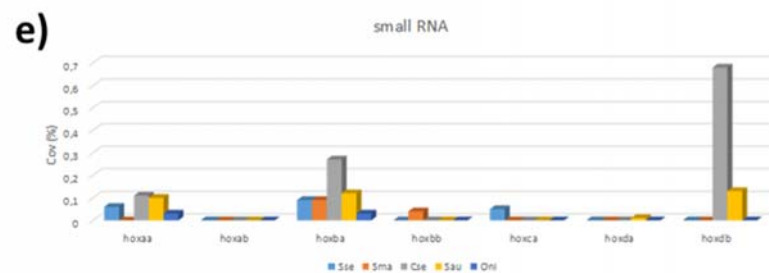
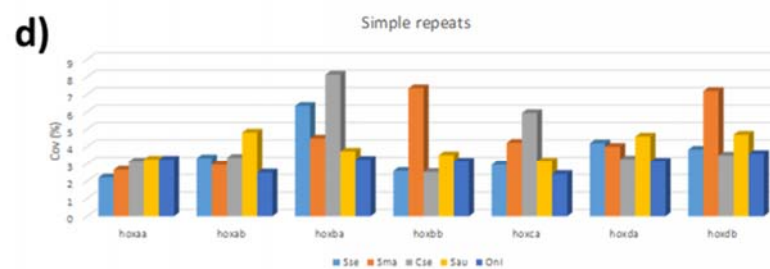
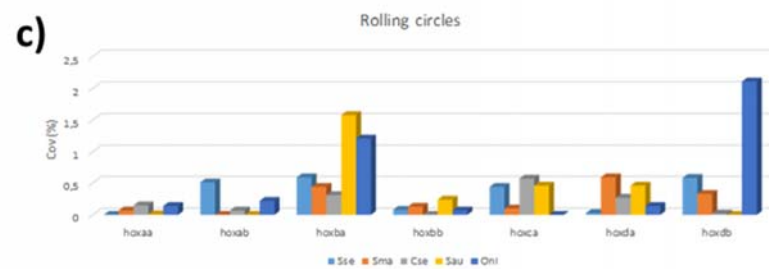
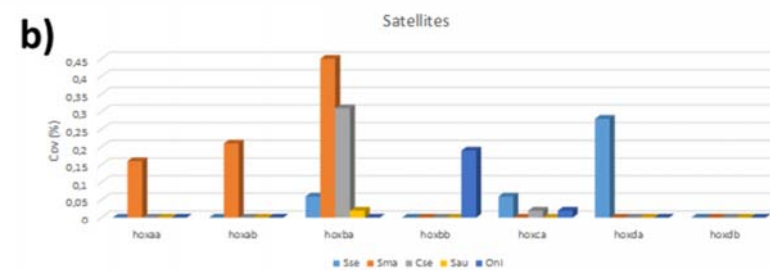
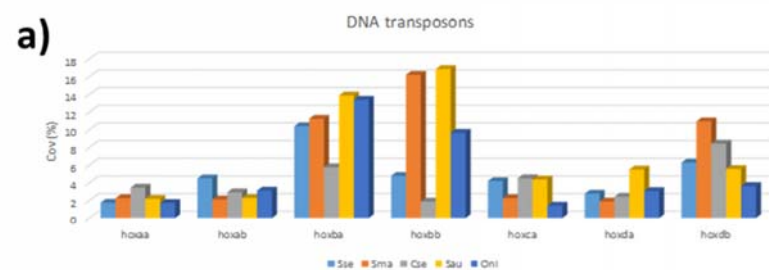


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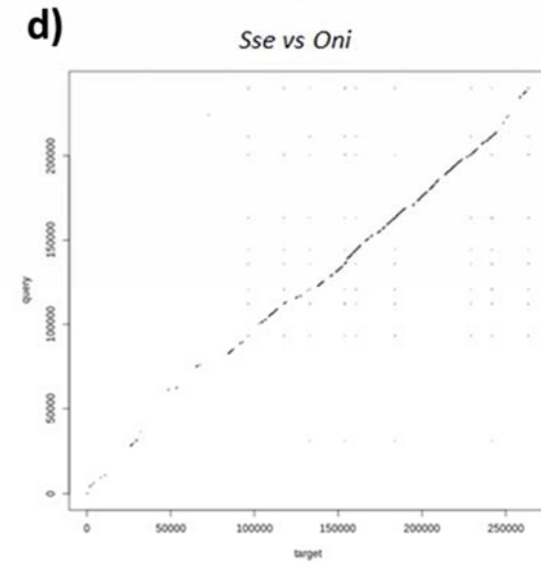
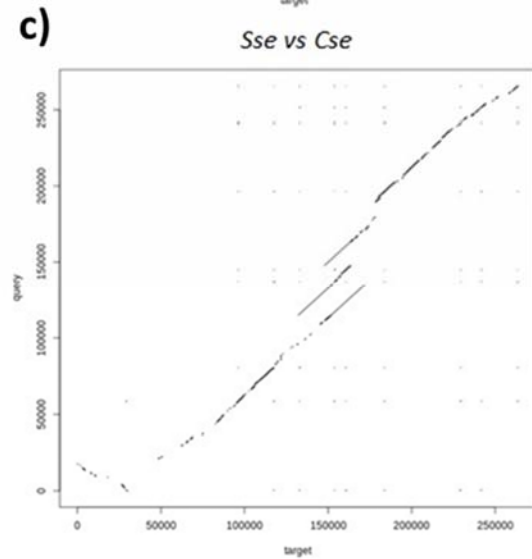
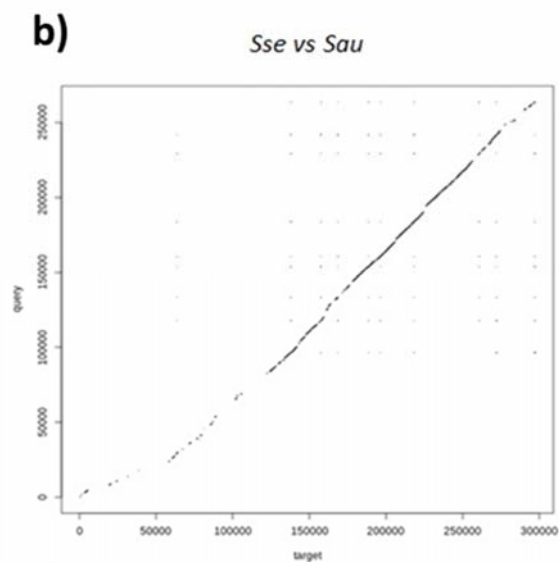
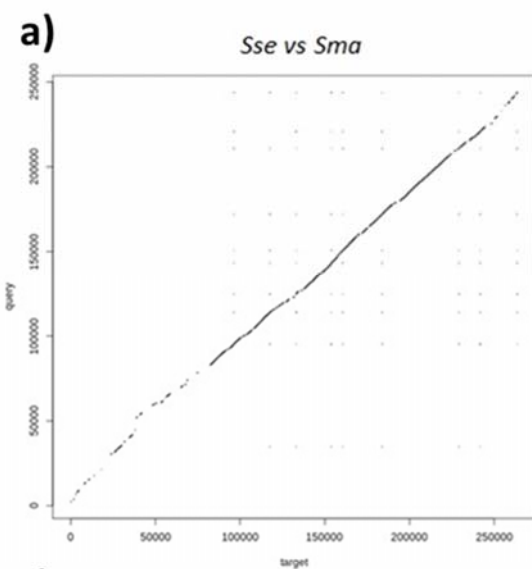




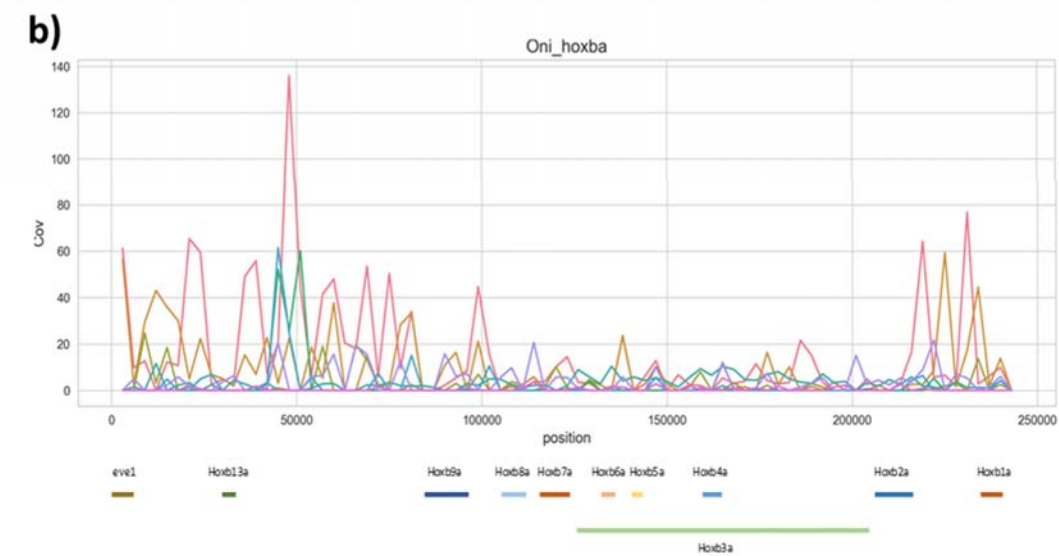
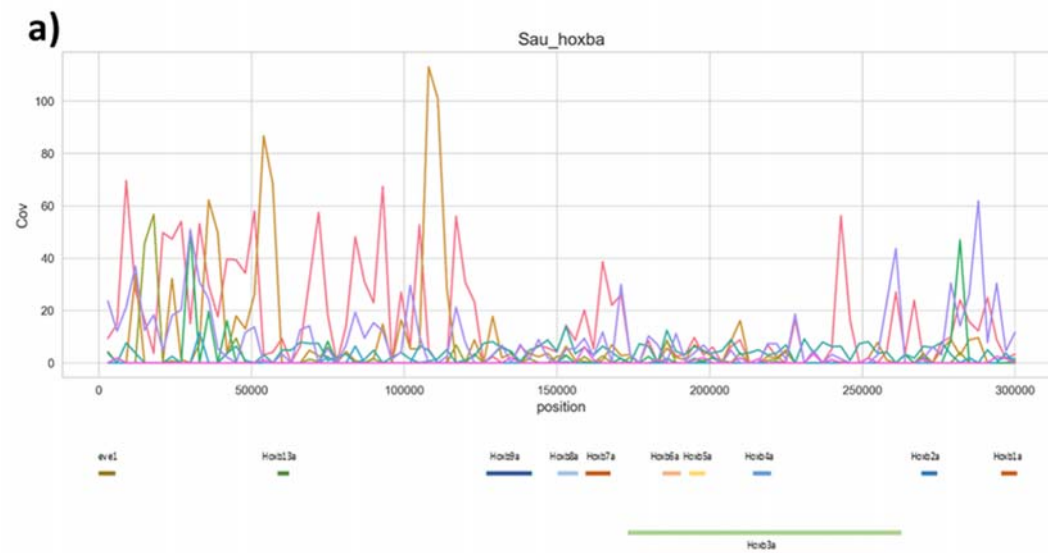
**Figure S1.** Number of loci per Mb and coverage of repetitive elements in seven *hox* cluster of (a) *Cynoglossus semilaevis*, (b) *Scophthalmus maximus*, (c) *Sparus aurata* and (d) *Oreochromis niloticus*. The repetitive elements analyzed were Retroelements, DNA transposons, small RNA, rolling circles, satellites, simple repeats and unclassified repetitive sequences (Unknown).



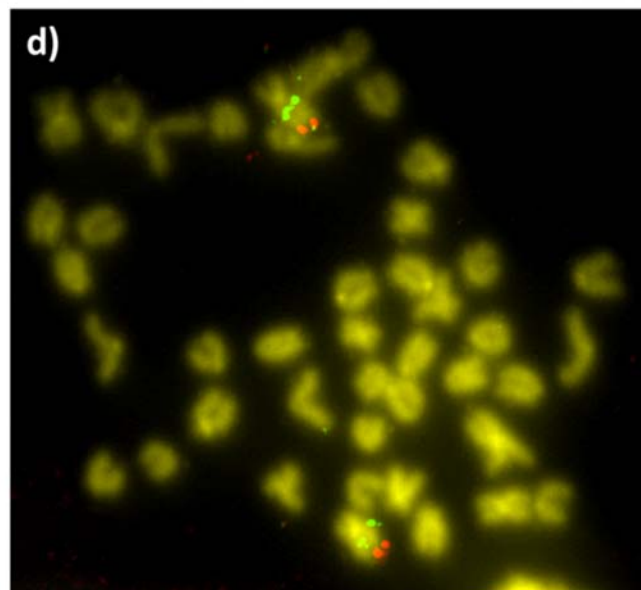
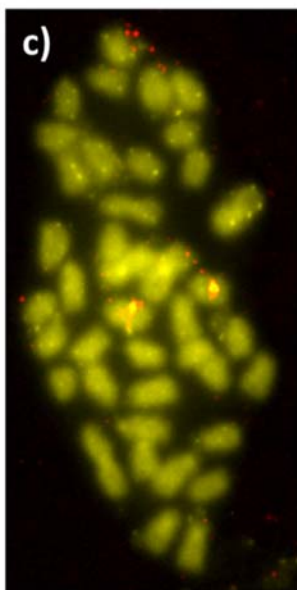
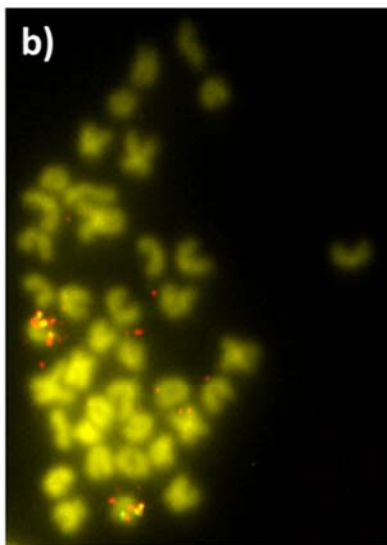
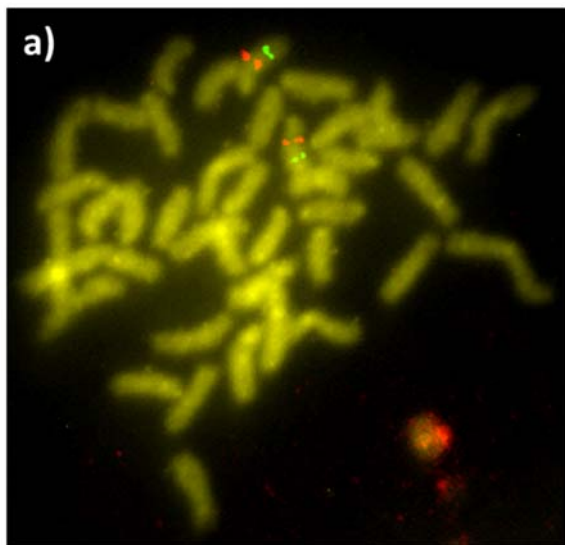
**Figure S2.** Coverage (%) of (a) DNA transposons, (b) satellites, (c) rolling circles, (d) simple repeats, (e) small RNA, (f) low complexity and (g) unclassified repetitive sequences (Unknown) in seven *hox* cluster of five fish species: *Solea senegalensis*, *Scophthalmus maximus*, *Cynoglossus semilaevis*, *Sparus aurata* and *Oreochromis niloticus*.



**Figure S3.** Nucleotide dot plots of the *hoxba* cluster sequence stretch between *Solea senegalensis* and (a) *Scophthalmus maximus*, (b) *Sparus aurata*, (c) *Cynoglossus semilaevis* or (d) *Oreochromis niloticus*.

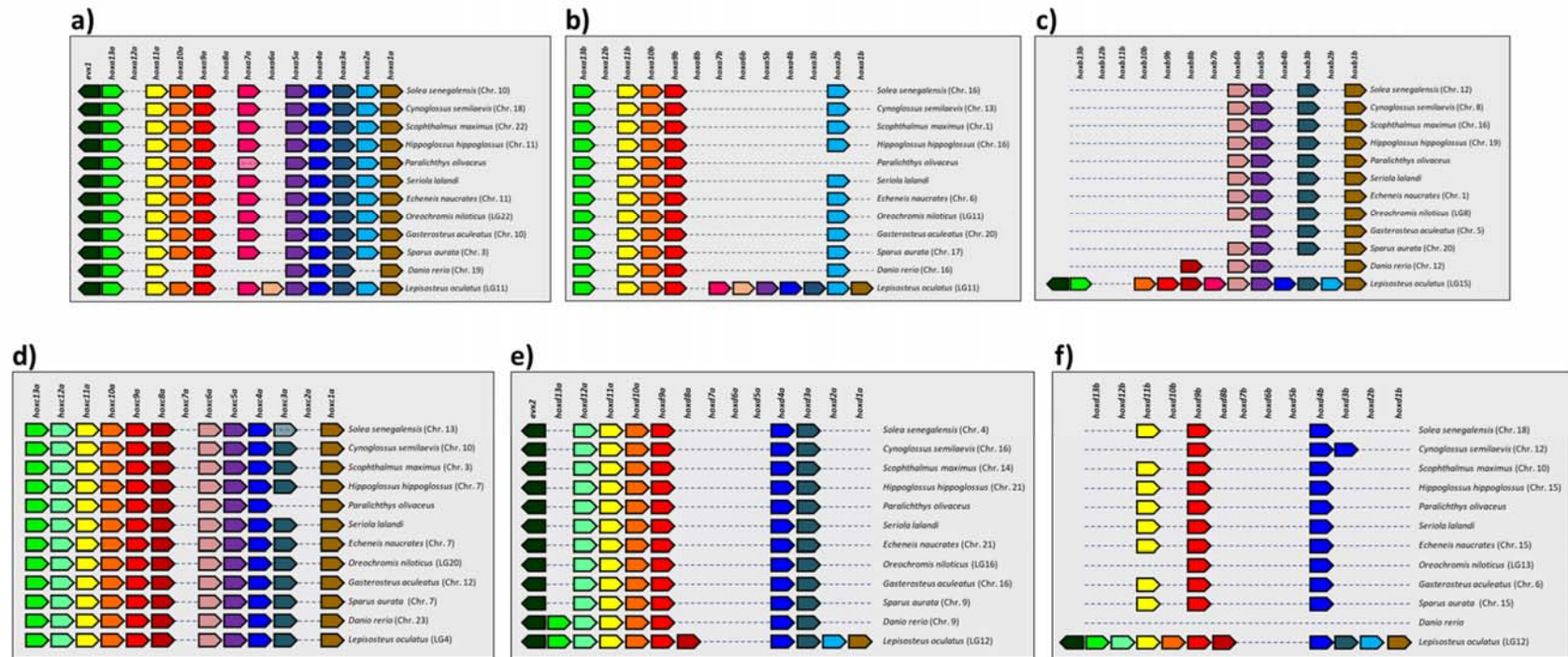


**Figure S4.** Abundance of repetitive elements, measured as coverage (%), along the *hoxba* cluster sequence of two teleost species (sliding window 3kb): (a) *Sparus aurata* and (b) *Oreochromis niloticus*. Repetitive elements analyzed were: DNA transposon (light red), LINEs (light orange), LTRs (light green), RC/Helitron (green), Simple repeat (blue-green), SINE (sky-blue), Unknown (purple) and low complexity sequences (pink).





**Figure S5.** BAC-FISH of among *hox*-bearing BAC clones and BAC probes used as chromosome markers for *Solea senegalensis* karyotype: a) *hoxab* (red)-BAC 54E18 (green); b) *hoxbb* (green)-BAC 38B21 (red); c) *hoxca* (green)-BAC 4M14 (red); d) *hoxda* (green)-BAC 36J2 (red).

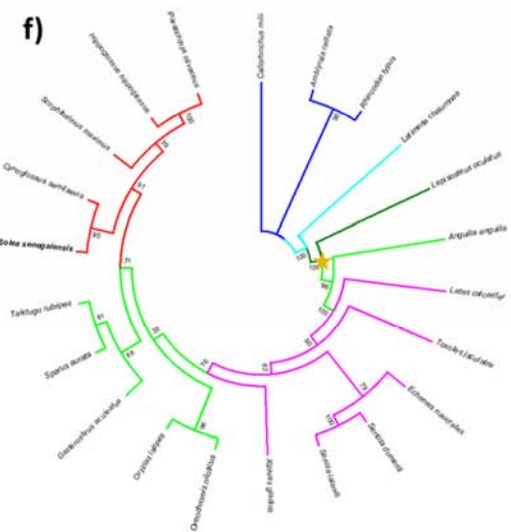
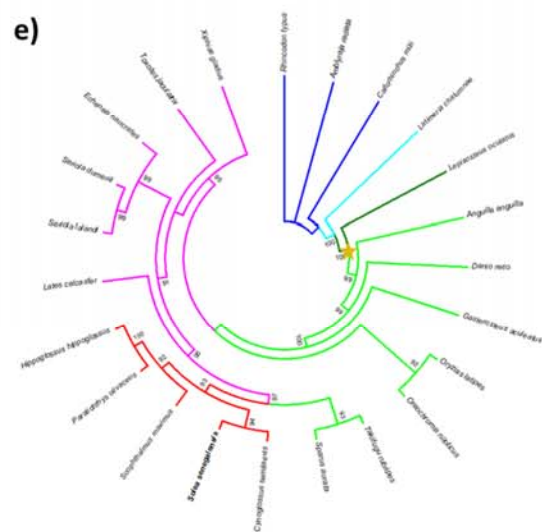
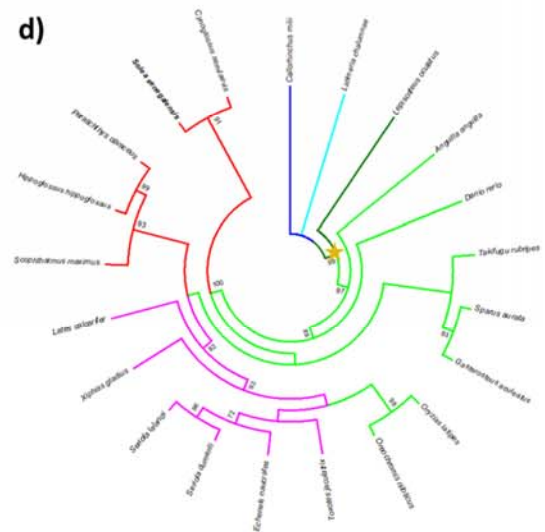
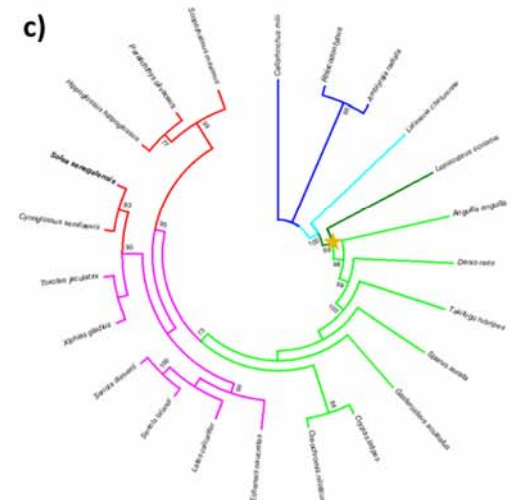
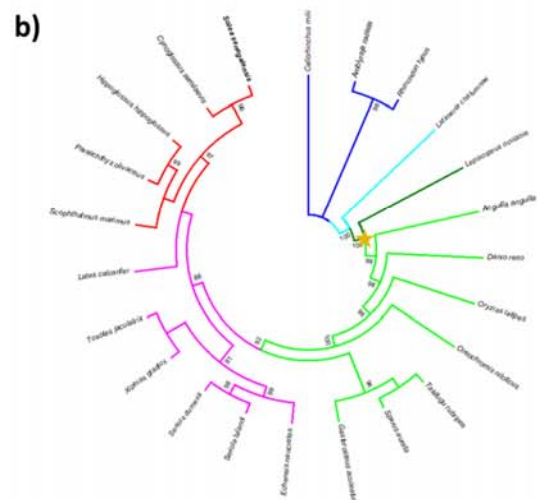
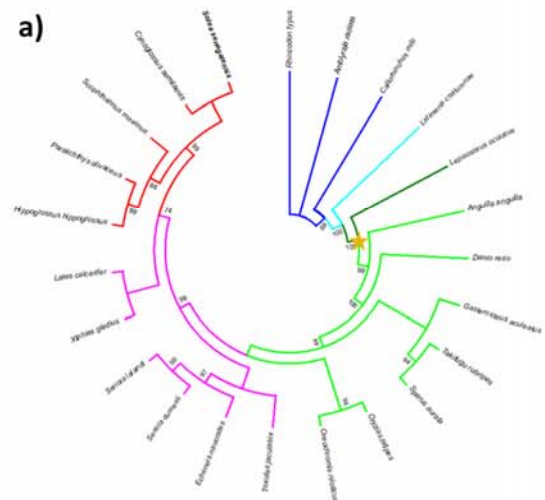


**Figure S6.** Schematic representation of the (a) *hoxaa*, (b) *hoxab*, (c) *hoxbb*, (d) *hoxca*, (e) *hoxda* and (f) *hoxdb* clusters synteny among different fish species. Same colors represent same genes. Transparent boxes represent genes that were positioned by means of different scaffolds.

**Table S2.** Polymorphisms detected within teleost species referred to the consensus arrangement of each cluster.

Cluster	Consensus arrangement (5'-3')*	Polymorphism
<i>hoxaa</i>	<i>evx1-hoxa13a-hoxa11a-hoxa10a-hoxa9a-hoxa7a-hoxa5a-hoxa4a-hoxa3a-hoxa2a-hoxa1a</i>	Absence of <i>hoxa10a</i> , <i>hoxa7a</i> and <i>hoxa2a</i> in <i>D. rerio</i>
<i>hoxab</i>	<i>hoxa13b-hoxa11b-hoxa10b-hoxa9b-hoxa2b</i>	Absence of <i>hoxa2b</i> in <i>P. olivaceus</i>
<i>hoxba</i>	<i>eve1-hoxb13a-hoxb9a-hoxb8a-hoxb7a-hoxb6a-hoxb5a-hoxb4a-hoxb3a-hoxb2a-hoxb1a</i>	Inversion of <i>eve1</i> and <i>hoxb13a</i> in <i>C. semilaevis</i> Absence of <i>hoxb7a</i> in <i>C. semilaevis</i> , <i>H. hippoglossus</i> and <i>P. olivaceus</i> Absence of <i>hoxb8a</i> in <i>G. aculeatus</i> <i>eve1</i> pseudogenization in <i>S. aurata</i>
<i>hoxbb</i>	<i>hoxb6b-hoxb5b-hoxb3b-hoxb1b</i>	Absence of <i>hoxb6b</i> in <i>G. aculeatus</i> Absence of <i>hoxb3b</i> in <i>D. rerio</i> and presence of <i>hoxb8b</i>
<i>hoxca</i>	<i>hoxc13a-hoxc12a-hoxc11a-hoxc10a-hoxc9a-hoxc8a-hoxc6a-hoxc5a-hoxc4a-hoxc3a-hoxc1a</i>	Absence of <i>hoxc3a</i> in <i>P. olivaceus</i>
<i>hoxda</i>	<i>evx2-hoxd12a-hoxd11a-hoxd10a-hoxd9a-hoxd4a-hoxd3a</i>	Presence of <i>hoxd13a</i> in <i>D. rerio</i>
<i>hoxdb</i>	<i>hoxd11b-hoxd9b-hoxd4b</i>	Absence of <i>hoxd11b</i> in <i>C. semilaevis</i> and <i>O. niloticus</i> Duplication of <i>hoxd4b</i> in <i>C. semilaevis</i> Cluster absence in <i>D. rerio</i>

\* For knowing the specific gene orientation, see figure 5 and supplementary material 6.



**Figure S7.** Phylogenetic trees constructed from clusters *hoxaa* (*hoxa1a*, *hoxa3a*, *hoxa4a*, *hoxa5a*, *hoxa9a*, *hoxa11a*, *hoxa13a*, *evx1*), *hoxab* (*hoxa9b*, *hoxa10b*, *hoxa11b*, *hoxa13b*), *hoxbb* (*hoxb1b*, *hoxb5b*), *hoxca* (*hoxc5a*, *hoxc6a*, *hoxc8a*, *hoxc9a*, *hoxc10a*, *hoxc11a*, *hoxc12a*, *hoxc13a*), *hoxda* (*hoxd3a*, *hoxd4a*, *hoxd10a*, *hoxd12a*, *evx2*) and *hoxdb* (*hoxd4b*, *hoxd9b*). Blue lines: Chondrichthyes lineage; cyan lines: Sarcophtherygii lineage; dark green lines: non-Teleostei Actinopterygii lineage; light green + pink + red lines: Teleostei lineage; pink + red lines: Carangaria lineage; red lines: Pleuronectiformes lineage. Yellow star denotes the teleost-specific genome duplication (TSGD) event.