

SUPPLEMENTARY MATERIAL – Figure S1

Growth hormone gene polymorphism associated with grow-out performance of *Oreochromis niloticus* strains

Marco Aurélio Dessimoni Dias, Rafael Vilhena Reis Neto, Júlio Sílvio de Sousa Bueno Filho, Suhaila Karim Khalil Jaser, Aline de Assis Lago, Alexandre Wagner Silva Hilsdorf

Alignments of the 5' flanking region and initial region of finfish growth hormone (GH) gene. Alignment of 1,598 bp of the 5' flanking region, 5' UTR, Exon 1, Intron 1 and Exon 2. GH gene of the *Oreochromis niloticus* (**On**), *Oreochromis mossambicus* (**Om**), *Sparus aurata* (**Sa**) and *Fugu rubripes* (**Fr**). The TATA box, +1, the putative binding sites to transcription factors and microsatellites are highlighted in different colors (see legend). Putative binding sites for transcription factors were identified based on two previous works: Almuly *et al.* (2005) and Sekkali *et al.* (1999).

On: gagctcattggt-gacttcaggggagacagcactgactt--agccccctttacatcaacggggagt
Om: -----gacagtaagaagcaagcagaggagaaaaaacag--aacatttttttagaagcagatttgat
Sa: ----gaaggacaaatgtccagagaacactacagacaccttcagtagt **tcagtcag**agcaacaacaac
Fr: -----gacaccaatacaggatattagcttacacctgctggacaaggggtgcagaagca

On: gtgtggagagagtccacac---cttccggttcctt-ggtgtcctcatctctgctg-acatctcctgg
Om: ccttaaatggctgtgcaatc---attataa---ctt-acaacacaggtcaatgtag-acccatacaa
Sa: ctgtaaat-caatacaaaactagattctgatcactgaggttcccttggaacgcgatacatacagtga
Fr: ccattgactgtgccatattgt-----tgtgacctgtagatgctctccaca-caccttatatcacattt

On: acag-acaacatct-cagcggctcg-caagaaggccaacagcggctgcacttccctgagggtc---c
Om: ccaa-attagacta-acacatatag-tattaaaaac-accatctactactgtgtctgaatgtgtggt
Sa: gcgctactgtaact-gcacagctgc-gttca **gtggc-atcat**taaacgctgaggctca-tatagcct
Fr: ttgagccttcatctcatgcagatgttctctctgcagttgtttttatttgcatgtgtacggat---c

On: tcaggaagtgcagctga-actccgacc----tgctgctgaccttctaccgctcgtccattgagagc
Om: attggcactgtcagttta-ggcctgaag----agatattgtgttaaaaaagaccact **aatttaaat**
Sa: ctgtattccctcagctgagagctgacacacatgatgctactttcaaggagaggatcagtgaaag-
Fr: aaagaaacgccgtcttgacagcttaccat--ttaatctggtgaataaagtgttagtcagacacaaa

On: ctgctaaccctactgcatcacggtatggtacgg-cagctgcacta-ag-----gcggatagagcga-
Om: **ataatcattacat**acttgttaaaagttaactt-ccaatatataa-agtttctaataagcaaatgac
Sa: gcactgcctaaatgctggataaaaagatattgactagaacagaataagataagacactcagcttaa **t**
Fr: acgttataactaataactgtatattgaaataa-cagaagggagtaagccagtcattgtagcacta-

On: -ggctt-cagagtgtggtcaagacagcaciaaaagat--catcggtgcctctccctcctctgatga
Om: cagatc-taacatgtggcagggttt **atatgtaacat--aaatgttttctttatgattcaa**ctgtgga
Sa: **gacatca**cggaggctattgcagtttgtagagaaggtgcactcgtatttgcttaccagctgcttagga
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On: catttattcctcctgctgcctcagcagagcagcgaacatcat---caaggacagctcccacctggc
Om: atttaacttaattctttagaaggacaagctatattactttattctcaagtataaagccaacctgac
Sa: **atgatatt** **atgttatt** **atttga**ttgtgctg **atgttat**-----a cttatttcgtgtccacaa
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On: **ttcaacat**ggtt--cagcctgcttccctcagga-agcgt-acaggtgcatcagc **acaaa**aacc--
Om: **tttaaccat**ttaacaggccactaatctggattatagctttc **acaacaa**aacc **tttttttaaacac--**
Sa: ttttaatatTTTTTTTgacctgtaattgctggggctccgta- **acaacaa**aacctcaaa **acaaacaaca**
Fr: tttcagagcta--ataatatgtacacttagcggaaataca-----gcatttccaaattattgttc

On: -a---cagactcaaaaacagtttcttccctaaagccataaccaccctgaactcacacatgcaccgat
Om: -at ttttaaaccaaaataaataactattgttattattattattatttttaaaatata----at
Sa: aacaatcaaaaacaacaaacaacatcaacaacaaca-aaccatcataacaacaaactaaca---ac
Fr: -tttttaggttgcaaacctttggattgctggggtga-aatca--gtgagaacatgctcatat--gc

On: aacacagacccccccccctccccctcacaatttcttttttttccatttcc--catttctctat
Om: aaaacagaaaagtggtaaatataaaaagcagttcgcttatgttgtaataa--aggctagatttg
Sa: aaatcacgctgttaaccagtggtttgtgtaccgatggtaa tgagatgaacct--gttggttgcttc
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On: ggaccactataacaataccaaat-tctatgtgc-aataaccactgtatatacacaacacttattt
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Sa: gtcatgtatctgggtctctgtgctcgtctctc-tgtccgcagcgttgaataaa-gtcagtttctc
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On: attacatattacttttttaaaactggcttgaatattgtacattttatataatattttttccctc
Om: aaaacgtcggagcatttttgcaaatatgtgtgcttgataaatcgagcagatatttgaactttacac
Sa: gtgatgtc--accgctgcagt-ctgacctg-agatcagtgacatctgtgaaatcaatt--catcaaac
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On: tggta-atactgtccatattgtatattgtgctgcagaactgtgccgccccccccccagcatgttt
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Sa: atctgttttccagcagcagcagc---agcagctttcccg tgaat-ca cctgtaaatattcagagtc
Fr: tttttcatttttagttgggttagtt--tattgctaaaccagttct--gttcacatctatattgtctg
Microsatellite (-719)

On: gcaactgagtaggagatgctctgtatctca-ttgtacaaccgtatagtgacaataaaggc attctatt
Om: aaaagtttttttagccggtcctccgcca-ttgc-cgcgcttacaagtacg-cacaggctctagcaa
Sa: acacg cgtca catcgtttcatctgatgga-tt ctgttcattaaacttcaatca tattgtaatcaa
Fr: acaagcagcaaaagacttgtttgatggcaaaccttatttctggatgttctttgtagaaaatgaagatcgt

On: ctattctattctattctattctattctattct aattatttctagtgtacttgattctccaacacgtg
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Sa: tctgtttgatcagctcagctc---tctgtttccgttcacttcagcct-----gtattcaaatctgca
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On: actga-tttcacctgtaaaatgtgtccatggctaggcgcagtgatgatgacacctgaggaatagaa-
Om: tttaa-gatattttcaggatgtgtccatggctaggcgcagtgatgatgacacctgaggaatagaa-
Sa: tcca---tcagccttcaatattgatcataactaaac-tggtcagtg atgatgtc--acaaacggtt-
Fr: tggacacttcacagtggtatgtggaaaaatggttctctttctggaattttaaagcttccatcttcaactg

On: taagtatggggagaaggaaccttgaattatgaaatagctgcacttta-a-tgtaagtttcat taaag
Om: taagtatggggagaaggaaccttgaattatgaaatagctgcacttta-a atgtaagtttcat taaag
Sa: catgtttgagattgaaaatggtt---tta tgc atcagtcaga aatt agaaca acacggtcaccat--
Fr: tgattatgggtatgcagattttc---ttagctatacacaatatat-agagtgttaaatacaacacaga

On: tgtttgcaggtccaactgataaagcatgaatgttaaatgtgtgcacctttatttcagaattcagtt
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Sa: gt-actgtgttccacag tta-aa acctcatcccaac atgt-tatt tatttagttatttagttaga
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On: agcatgtgcttcaaagtgacttctctgtggatgaaagctcga-ataaaa--tcttttcacctgaaa
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On: aatttgatttg**atgtaaatatttt**gga-gtttttg**aaaactttacat**t-agatctct--tttaa**at**
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 Fr: aagatgattta**aaacat**ggttttaaattgattttaaagtttttctcatctacctggtgtgctcctctgtc

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 Om: **gttaacaacaacat**ggttgatgtcagagcact---ttagtcaccagcg-gtgtg**tttttcat**gtagcat
 Sa: **ttt-----ca**gtcttaaccttaaatacagt---tcagc**cgta**acatgcagagtttttatgatc**cat**
 Fr: tctgtgcttccctttcacctttctgtactcagt**tattgt**cactc-ttttcatttagatttggtg

On: caata**tgatgat**ga-ggtgtta**atggttaatta**gacttag**acacac**g-----**t**
 Om: caata**tgatgat**ga-ggtgtta**atggttaatta**gacttag**acacac**g-----**t**
 Sa: **aaatattattat**ga-ggt**tattcatgttaaa****cacacacacacacacacacacacaca**ctcggtagt**t**
 Fr: gagcataaactttcatgacataaatttctattaatattcttattctctgttaaaaaca---ggtagat

TATA box

On: **gtttg**ct-catgtcacgtttctctctg**atgaatttaaacat**ctagttttcaac**tataaa**agc-a-aaa
 Om: **gtttg**ct-catgtaacgtttctctctg**atgaatttaaacat**ctagttttcaac**tataaa**agc-a-aaa
 Sa: **gtttgt**t-ggtttcatgtttctgttg**atgaatttaaacat**caagttttctg**tataaa**acc-aaaa
 Fr: gtttttttggttcatgttttctctttttgaaatttaacatcatggtatt-acc**tataaa**agagatgag

+1

On: actctgagctgaaaac**a**tcagaaccaccga-ctcacatca----taatcatctgagccgaaacaga
 Om: actctgagctgaaaac**a**tcagaaccaccga-ctcacatca----taatcatctgagccgaaacaga
 Sa: agtctgagctgaaaat**a**tcagaacgactgaactcagatcagatctagtcaccagaacttgaacaaaa
 Fr: ccaccgaagtgga---**a**tcagatcgagacaacctgaaacag----aacc--taaagtctgaagcaga

Start Codon

On: gcctgaactgatgccagcc**ATG**AACTCAG-----
 Om: gcctgaactgatgccagcc**ATG**AACTCAG-----
 Sa: accagaacctgaaccagac**ATG**GACAGAG-----
 Fr: gcaaca-----**ATG**GACAAAGgtgacggcaacttgttttgattcatcttatatctcatt

On: -----
 Om: -----
 Sa: -----gtaagacataaagatcagcat
 Fr: ctttattttgacagctgaaatttctgaatttataaaagtcaatctagccaataacataaagctttga

On: -----
 Om: -----
 Sa: ttccagactccttcacatctgtctctctctccctc-tctctccctgacctgtctgtct---ctctgac
 Fr: gtcaggctctatgctttgatttctcttctcccatctgtctgtcacttgtctttgcggaccttaac

On: -----
 Om: -----
 Sa: -ctgtctctctctgacctgtctctctctctgacctgtctgtctctgacc-tgtctgct--ctctgacc
 Fr: tctaaccctacctgtctaaccctaaccctacctgtctaaccctaaccctacctgtctaaccctaacc

On: ---gtaagacatctgggc-tccccacgagaaggaccactgctttatgatgtttaacaaagtctga
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 Sa: tgtctct---ctctgacc-tgtctgtct--ctctgacc-tgtctctctgacc--tgtctgtctctga
 Fr: ctaaccttaactctaaccctaacctgtctaactctaaccctaacctgtctaaccctaacctgaggctga

Microsatellite (+141)

On: aa**ctgtctgtctgtctgtctgtctgtctgt**cag-----
 Om: aa**ctgtctgtctgtctgtctgtctgtctgt**cagt-----
 Sa: c-ctgtctgtct-ctgacctgtctctctctgacctgtctctctctgacctgtctctctgacctgt
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Om:-----
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On:-----
Om:-----
Sa:tctcag-----
Fr:ccttacctgaggctgaatccactgtcttctctacctgtcttaacccttacctgaggctgaatccactgt

On:-----TCGTCCTCCTGCTGTCGGTTGTGTGT
Om:-----CGTCCTCCTGCTGTCGGTTGTGTGT
Sa:-----TGGTGCTCATGCTGTCGGTGATGTCT
Fr:cttcctacctgtcttaacccttacctgaggctgaaccctcag---TGATACTCGTGTGCTGATGTCT

On:TTGGGCGTCTCCTCTCAGCAGATCACAGACAGCCAGCGTTTGTTCCTCCATTGCAGTCAACAGAGTCA
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Sa:AACACCTCCACCTGCTGGCTCAGAGACTCTTCTCTGACTTT
Fr:AACACCTCCACCTGCTTGCTCAGAGACTTTTCGCAGATTTT

Highlighted Sites:

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|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
|  AP-1: activating protein-1 binding element |  N-Oct-3: neural POU-domain protein |
|  Pit-1: pituitary-specific transcription factor |  GRE: glucocorticoid response element |
|  CRE: cyclic AMP response element |  MEF-2: myocyte enhancer factor 2 |
|  HNF-3: hepatocyte nuclear factor-3 |  Microsatellite |

References

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Sekkali B, Brim H, Muller M, Argenton F, Bortolussi M, Colombo L, Belayew A and Martial JA (1999) Structure and functional analysis of a tilapia (*Oreochromis mossambicus*) by pituitary transcription factor Pit-1. *DNA and Cell Biol* 18:489-502.