

Supplementary Table 4. Sequence encoding α -mannosidase in *HkyuLL 10* genome.

Encoding sequence	atgaaaaagaaaacgggtacatatcatctcacagtcattgggacgcagaatggtatatggcttatgaagaacatcatatgcgtttagcaatfta gtggatgattactgatttattcaagaagatcctgagttgtagctttcatttggatggacaacgattatttttagatgactatttgcagctacgctc ctgagcgtctgaggagtagacaagcagcgggttcagctggaaaattgaaaattggccattttatatcttacaagatgattcctcattagttctga atcaaacgttcgtaatatgcttgttggcgtaaagaatcggagcgttgggggctccagttgagttgggtatttccctgatacttttggaaat gggccaacgccacaatgatgaaagcggcaggacttagcctgcagcttttggctgagggagtgaaaccaatcgggttgataatcaagttt ggaacaatcagaggaagcctacagttcacaatttcagaaatgtggggggaagtcctgatgggacaaaaattcttgaattctatttccaatt ggtattcaaatgaaatgaaatcctgctgaaaaagcagcagcactgaaatgggaatcaaaaattagcagatgtgaaaaattgcttcacat cacatcttaaatgatgaatggcgtgagatcaaccagttcagaaaagttgagcaaaagcattcgttggcaaatgaaatcttccagattatg agtttcttacttaattggccaactatttgaagctgtaaggtcagatttggaaaacttatctacgtaaacaggggactaacctcacagga aacgatgctgtgtacactttagcaaatcagcgttcgagtgagttatctcaacaatggaatacaaaagttgagcagttgaaaattgta cagaacctctcgcagtttagcttatcgggtgacaggagagatccgcagcaaaatgactatgcttggaaaactttgatgcaaaaatcca catgatagatctgtgttctctgtgacgaagtctcgtgaaatgatgacagctttgaaaaagcgaatgaagtagggaaatattctctgat gatgactatttgaactcgtaaagcttacttgaagcacaatccttttgcgttttaatacagctggacattcaaaacagtgaggctga agttgaagtagttctttagcgaatattttaaagaaagaaatcctgaaaaactttatgatgaaatgaaagcagacccaaggaactataaag taatcaatcgtgaaagcgaaggtccagctgaaatcagtgaaagaagttttatttgattatgattaccgaaagatcgttccgagttcctta catgaaacgatttggaaagtgaaatattttaaagaaatgagtgcttttctgggaaagtttgatttggactactgacgatgacagcttt gataatgcttctgacgtaataatgaaagtagatttctgtcaacaatgaaaatgaaagttgaaactgacagtttaataatgaaatgaa gtattttgataagtcgctcaataaagttttaaagatttctgtcttgaagacactggtgataattggaatgaaatataatctattccaactaaaat accaaaagcaatttttctactgacagctctgtaatttcaattactgacagcagcaaaatgagggaagttcagcttaacaagtgctgatg tcctgaatctgctgacgaatattgtagaggaacaaaaaggtttggaattccgtatcgaatgctgctgctgataacttttgcctttag aggtacaagcaaatcactgtacgtaaaaattcaaaaaagttgatttgaaacagcattgataatcaaatgaaagatcagacactcgtgta ctatccagcgggattaacaagcgaatcacgaagctgacagatatttgaagtagtgacaagacctaattgatgctgaaactgggaaa atccaacaatccacagatcagcaagcttctgtaatttcacaatgaaataggtttaaactgttgtaattttgtttaaataatgaaatgaa ctgacagcgaatattccctaacttacttagaggagttgagaactggtgattggggtacttccaacaccagagcgtcaaaccttagga ctgcatacttttaactatagtttagaatttcatgaccggcttacgaacgttatgaaactatcaacatgcttatgttgcacaagttccatttcaacg gtagaactgacaaatccgtagcagcaaaaaacttaccgtcagctgggagaatattgaaatgatactgataaattgctatcacggcattgaa acgtcgcgaatcagataatgcttagttttagaggctacaatattcctccgactttgtga
Amino acid sequence	MKKKTVHIISHSHWDREWYMA YEEHMLRVNLVDDLLDLFKKDPEFDSFHLDGQTIILD DYLQVRPERREEVQAAVSAGKLIKGFYILQDDFLISSESNVRNMLVGRKESERWVGAPVE LGYFPDTFGNMGQTPQMMKAAAGLSAAAFGRGVKPIGFDNQVLEQSEEA YSSQFSEMWW EGPDGTKILGILFANWYSNGNEIPAEEKAAALEFWNQKLADVEKFASTSHLLMMNGVDH QPVQKDLSKAIRLANELFPDYEFVHSNWPTYLEAVRSDLFENLSTVTGELTSQETDQWYT LANTASSRVYLKQWNTKVERQLENVTEPLASLAYRVTGEYPHDKLTYAWKTLMQNHP HDSICGCSVDEVHREMMTRFEKANEVGKYLADDALFELAKVIDFEGQHPFVVFNTAGHS KTGEAEVEVVLERKLFKEGIPEKLYDELKAQPKATYKVINREGQEVPAEISEEEVLFYD LPKDRFRVPYMKRFVKVFLNEMSAFWSWESFDLVLTDADSFDNSSVSNNESMISGQTI ENESLKLTVNHNGTSLIFDKSLNKVFKDLLVFEDTGDIGNEYIYFQPKNTKAIFSTDSPVEF SIITDRAEIAEVQLKQVLMIPESADELLEDEQKQVLEFRYRNAGRSDKLLPLEVTSKITVR KNSKKVDFETSIDNQMKDHLRLVLPAGLTSNHEADSIYEVVTRPNVMPETWENPTNP QHQQAFVNLHNEEYGLTVGNFGLNEYEITDSANIALTLRGGVGLDQWGYFPTPEAQLT GRHTFNYSLEFHGPAYERYETYQHAYVAQVPFSTVELTNPSAEKTLPSAGRILEIDTKFA ITALKRRESNGLVLRGYNMXSGLC