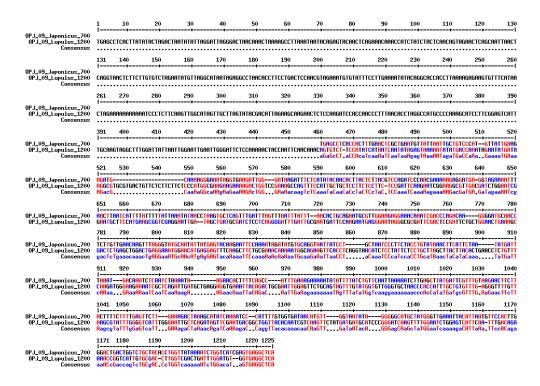


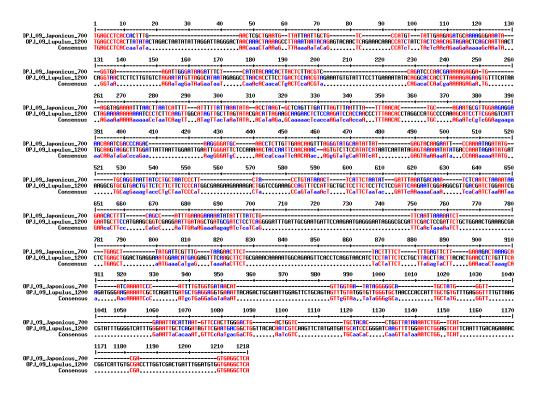
Figure S1. Nucleotide-sequence alignment of the sequences amplified by OPJ-09 in *H. japonicus* and *H. lupulus*.

(a) 700 bp sequence of *H. japonicus* and 1200 bp sequence of *H. lupulus*

Best match:



After taking into account of primers location:





(b) 1600bp sequence of *H. japonicus* and 1200 bp sequence of *H. lupulus*

Best match:

	1	10	20	30	40	50	60	70	80	90	100	110	120	130
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	TGAGCC	тсясяяя	GGACGATTAT	ATCGAGGATGO	CCAACTCCAA	AGCTGCTCCT	AGGGACÁAGT	CAACTCTTGAI	AGCTGAĞATTO	ACGCCATGT	TGGGCGATGT	CGAGCTTGCT	SAGGATCCAA	TTCCCCA
0311331133	131	140	150	160	170	180	190	200	210	220	230	240	250	260
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	GRICHGRAGGHACHGGTGGCTCACCAGGHARCCATCCAGGATCGTCCGGGAGACCCTTGCCGAGGTCGAGCCAHAATGACTAGACCCCACCGCCAHAACCATGAACCTTTATCTTTTTATTTGTAAAT												TGTAAAT	
	261	270	280	290	300	310	320	330	340	350	360	370	380	390
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	ATTTGA	CTCAGGC	ссттатаатс	AAGACAGTATA	AGTTTTTG	TAATAATTTT	AGCTTTCTTC	TTTTACCGGG	ACAATGATTT6	TTATTACTT	CTATGACAGT	1	TTTGTCTCCA TGAGCCTCAC TgaGcCTCaa	TTATATA
	391	400	410	420	430	440	450	460	470	480	490	500	510	520
OPJ_09_Japonicus1600 OPJ_09_Lupu1us_1200 Consensus	TTTTGC CTAGAC cTagaC	ТСАТАТА ТААТАТА ТаАТАТА	TATGTTTGAA TTAGGATTAG TaaGgaTgAa	ATATTATTGTO GGACTAACAAF agAcTAacaa	CTACAATGCA ACTAAAAGCC ACAAAAAGC	TGTTATATGT TTAAATAATA TgaaATAaga	CATGCTCTCT CAGAG CAgag	TACATACCATO TACAACTCAGO TACAaacCAgo	GTACATCTCCT AAACAAA-CCA aaACAaa.CCa	TAGAGATTT ATCTATCTAC TagAgaTac	TTAATAGTCG TCAACAGTAG TcAAcAGTaG	TATGAAGCGCI AACTCAGC aAcgaAGC	AGGGGCGAGT AAT AaT	TTACTTA TAACTCA TaACTcA
	521 	530	540	550 +	560	570	580	590	600	610	620	630	640	650
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	GGTAAC	TCTTCTT	GTGTCTAGAA	TTTCTCAAGT1 TATGTTAGGCA TaTcTcAaGca	TAATAGAGG	CCTAACACCT	TCCTGACTCC	AACGTAGAAA"	TGTGTATTTC	TTGAAAATA	TACAGGCAC-	CAC	TTAAAAGAG	AAGTGTT
	651 	660	670	680	690	700	710	720	730	740	750	760	770	780
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	TCATAR	CTAGAAA	AAAAAAAATC	ACTCTTCATAC CCTCTTCAAG- aCTCTTCAaa,	TTGGCAT	AGTTGCTTAG	TATACGACAT	TAGAAGCAAG	AACTCTCCAAG	-ATCCACCA	ACCETTTAAC	ACCTA	GGCCATG	CCCCAAA
	781	790	800	810	820	830	840	850	860	870	880	890	900	910
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	TCCACC GCATCC gCaaCC	TTAATCA TT TT	CGAGATTACA CGGAGTCA CGaaaTCA	ATCGTGCCGAC TTTGCAAGTAC aTcGcaacgAC	ACTAAGTGA GCTTTG GaCTaaG	CAGGGTTTTG GATTATTA GagTaTTa	CCAGGTTTTA ATTGGAATTG acaGGaaTTa	ATACACATTA AATTG AATTa	GGCCCTTTATC GGATTC GGaaTC	ACCTAATTT TCCAAA CaCCaAA	ATAGACCTTT AACTACCAAT AaagACCaaT	ACCAATTATT(TCAACAAACA(aCaAaaaAca(AGTAGTGCG TGTCTTCCA GaGTagTcCa	TCTTTTT TATCATA TaTcaTa
	911	920	930	940	950	960	970	980	990	1000	1010	1020	1030	1040
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	ATTAGE ATCAAT ATCAaa	TAGGTTT ATAGAGT aaaGagT	ACCCTGCTTT AAAAATATAT AaaaagaTaT	GTTTAAAGCGC GACCAAATAGA GaccAAAgaGa	CATGTGTTTG PATATGATAR PATATGATAR	AGTGTCACAG GGCGT aGcGT	GGATGCCGAG GCGTGAC-TG GcaTGaC.aG	ATAGCTAGTTI TTCTCTTCTTI aTagCTacTT	AAGCCTAGTAT CTCCCATG aacCCaaG	TTTTGCAAT GCGAA GCaAa	GATTTTCAAG GAAGAAAAAGA GAagaaaAaa	CTCGGAGCTTA CT-GGTCCGAA CT.GGacCgaA	ATATCAGAG- AAGCCAGTTT AaacCAGag.	CAATTGT CCATTGC CaATTGC
	1041	1050	1060	1070	1080	1090	1100	1110	1120	1130	1140	1150	1160	1170
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	TGCTCC	TTCTCCT	TCTCCGAT	GTAACATTAAC TCAAGAATCGC gcAAcAaTaac	AAGGCGTT-	GACGATCT	-GGAATCGGA	ATGCT	TCCATGAAGCE	GTCGA	GGAATTGATA	GCTGATGCGA1	rctcctc	AGGGG <mark>A</mark> T
	1171	1180	1190	1200	1210	1220	1230	1240	1250	1260	1270	1280	1290	1300
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	TGTCGC TTGAT1 Tggagc	GAGTTTA GCGAATG GaGaaTa	ATTCTCAGTC ATTCCAAG ATTCcaAG	GACTGTACGAC -AATGAGGGA- ,AaTGaacGA,	TTATATGTC ATAGGGC ATAgGgC	TCGTTGAGTT GCGAT gCGaT	TCGTCATGAG TCGAC-TCCG TCGaC.TcaG	TTAATGATCT(ATTCTGCTGG(aTaaTGaTcg	CAATGACAGTO AACTGAAAG aAaTGAaAG	ACGAGTTAT CGA	CAATCTCTGT CTCTGA CTCTGa	GACTTAGCTA G-CTGGACTG G-CTgaaCTaf	AT-TCATGGA AGGAAATGGA Ag.aaATGGA	CAATCTT ACATGAG aaATcag
	1301	1310	1320	1330	1340	1350	1360	1370	1380	1390	1400	1410	1420	1430
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	GAGTTT	CAAGCTT	CTGCGAAACA	ATCCTCGCAAG AAAATGGCAGA AaaaTcGCAaa	1A	GTTCACC	TCAGGT	AACATCTCCTI	ATTCTCCTGC1	TAGCTTACT	TACACTGAAC	CTCTGT	TCAAGATGG	GAAGAAA
	1431	1440	1450	1460	1470	1480	1490	1500	1510	1520	1530	1540	1550	1560
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	ATCG	CTCA	GATTGATGC-	TTGATTAAAAT -TGAGGAGGTO .TGAggAaaas	AAATTACAC	ACTGCGAATT	GGAGTTCTGC	AGTAGTTTGT	ATGGTGTTGGG	TGCTAACCC	ACCATTTGCT	GTGTTTGAGG	TTTTGTTAA	GCGTATT
	1561	1570	1580	1590	1600	1610	1620	1630	1640	1650	1660	1670	1680	1690
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	TGGG-6	TCATTTG	GGAATTGCT-	AAACTGAAAAT CAGATAGT CaGAaAaT	TCGAATGAC	GGCTGGTTAC	ACANTCGTCA	AGTTCTAT	GATGATGCF	ITCCCGGGAT	CAAGTTTTGG	RATCTG	GAGTCATTCA	ATTTGAC
	1691	1700	1710	1720	1730	1740	1750	1760	1770	1780	1790	1800	1810	1820
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	AGAAAA	CCGGTC-	ATTGTG	TCGACTTCGTF CGACCTTGGTC ccaaCTTcGTa	CGACTGAT	TTGGATGTGG	TGAGGCTCA	CAGCGTTAGG	СТСТССТЕТТ	CCGCGAATA	CTCTTCGGAG	TACCAAGTCT	CCTACCGAGA	ACTGTCT
	1821	1830	1840	1850	1860	1870	1880	181092						
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	TCCTCF	IGACCETT	TTGTTAAAGT	ACTGTGTCATI	ттстбтт66	TACGTTGCGT	TTATCATCTG	TGAGGCTCA						



After taking into account of primers location:

	1 10	20	30	40	50	60	70	80	90	100	110	120	130
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	TGAGCCTCAC	AAAGGACGA <mark>ttat</mark> ttat ttat	ATACTAGA	CTAATA	FATTAGGATTI	AGGGACTAAC	ПААСТАА А	AGCCTTAAAT	ATACAGAGT	CAACTCAGA-	AACAAACC-	ATCTATO	TACTCA
	131 140	150	160	170	180	190	200	210	220	230	240	250	260
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	-ACAGTAGAA	CAGGTGGCTGTGG CTCAGCAA CaCaGcaa	TTAACTCAGG	TAACTCTTCT	GT-GTCTAG	RATATETTAG	SCATAATAGA	GGCC	R-ACACCTTO	CTGACTCCA	ACGTAGAAATG	TGTATTTCCT	TGAAAA
	261 270	280	290	300	310	320	330	340	350	360	370	380	390
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	TATACI	AGGCCCTTGTGGT AGGCACCA AGGCaCca	CCTTAAAAGA	GAAGTGTTTC	TAACTAGAA	RAAAAAAAA	CCTCTTCAA	GTTGGCATE	GTTGCTTAG	TATACGACAT	TAGAAGCAAGA	ACTCTCCF	AGATC-
	391 400	410	420	430	440	450	460	470	480	490	500	510	520 I
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	ATTTTGCTCA	TATATATGTTTGA		TCTACAATGCA -CACCAA CaaCAA		CCC	TTAACACCT		CARAGCATC	TTCGGAGTC	ATTTG	CAAG1	AGGCTT
	521 530	540 	550 	560	570	580	590 	600	610	620	630	640	650 1
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	TGGATTA	CTGTCATTCGAGT TTAATTGGAAT cTaATTcGAaT		TGAATTO	GGATTCTC-	CAAAAACTI	ACCAATTC	AAC	AAACAGTGTC1	TCCATATCA	TAATCA	IATATAGAGTA	AAAAATA
	651 660	670	680	690	700	710	720	730	740	750	760	770	780 1
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	TATGACCAAA	TTAACATTGTAAA TAGAATATG TaaAaaaTG	CTCTTCATAG	GTTTAACATTO	A	TAAGGCGT	G	CTCGCTTGTTF CGTGACTGTTC CgcGacTGTTa	CTCTTC		CTATTTTCCAT TTCTCCCAT aTcTcCCAT	GG-CGAAGA-	
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	781 790	800	810	820	830	840	850	860	870	880	890	900	910
		ACGAGATTACAAT AGAAAAGACT AGAaaAcAaT	GGT-CCGAAA		GGTTTTGCCI	AGTTTCCATT	GCTG	CTCCTTCTC		CTTCTCI	CGATTCAAGAA	TCGGAAGGC-	
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	911 920	930	940	950	960	970	980	990	1000	1010	1020	1030	1040
	TAGATAGGTT	TACCCTGCTTTGT GACGATCTG- gACGaTcTG.	TTAAAGCGCA	TGTGTTTGAGT	rGTCACAGGG AATCGGAATG aaTCacAagG	ATGCCGAGATI CTTCCATGA-I aTgCCaaGA.I	AGCTAGTTAA AGCG AGCa	GCCTAGTATT1 GTCGAG GcCgAG	TTTGCAATGAT GAATTGAT GaAaTGAT	TTTCAAGCT(CGGAGCTTATA AGCTGAT- AGCTgAT.	TCAGAGCAAT GCGAT GCaAT	TGTACT C-TCCT C.TaCT
	1041 1050	1060	1070	1080	1090	1100	1110	1120	1130	1140	1150	1160	1170
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	CAGGGGATTT-	TCTAAGCTGTGTA		GATTG-CO	GART	GAT	TCCAAGAA		TGAGGGAA1	[A	GGG	CGCGATTCG	CTCCG-
	1171 1180	1190	1200	1210	1220	1230	1240	1250	1260	1270	1280	1290	1300
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	CGCGAGTTTA	ATTCTCAGTCGAC ATTCTGCTGGAAC ATTCTcaggcaAC	TGTACGAGTT TGAAAGCGA- TGaAaGaGa.	ATATGTCTCGT CTC CTC	TGAGTTTCG TGAGCTG TGAGCTG	TCATGAGTTAI GACTGAGGAAI gaaTGAGgaAI	ATGATCTCAA ATG ATG	TGACAGTCACO -GAACATGAGO .GAaaaTcAcO	GAGTTATCAAT GAGTTTCAAGO GAGTTacaAa	CTCTGTGAC CTTCTGCGA- CCTCTGCGA.	TTAGCTÄRTTC	ATGGACAATO AAC	TTATTT CAAAAAT CaaAaaT
	1301 1310	1320	1330	1340	1350	1360	1370	1380	1390	1400	1410	1420	1430
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	GGCA	TGGGTGTTCATCC GAAGTTCA-CC GaaGTTCA.CC	TCAGGTA	ACAT		C	CCTAT		TCTC(CTGCTTAG	CTTACTTAC	ACTGAA	
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	1431 1440	1450	1460	1470	1480	1490	1500	1510	1520	1530	1540	1550	1560
	TTGCCCCCAG	CTTAATGTCTTGA TTTCAAGATGGGA cTTaAaGacggGA	TTAAAATCAA AGAAAATCGC agAAAATCaa	T-GGCATTAAC TCAGATTGATC T.aGaaTgAaC	TTAAGAGGG CTGAGGAGG CTaAGaaGG	TCTTTGTCGAI	ATCCGAAATA GAAATT GAAATa	GTGGAGTGAAA ACAGACTGCGA acaGACTGaaf	ATTAAACTTTA ATTGGAGTTO ATTaaaagTTa	TTCAATAAT TGCAGTA	TCTTTGTTCAA GTTTGT GTTcaa	ATGAACTAGT ATGGATGa	TACATC
	1561 1570	1580	1590	1600	1610	1620	1630	1640	1650	1660	1670	1680	1690
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	TGTT	AGTTACATAAACT GGGTGCTAACCCA aGgTaCaaAaaCa	CCATTTGCTG		TGTT	TGAGGGTTTT	STTANG	C(TATTTGGGG	[CATTTGGGAAT	TECTCAGATE	GTTCGA
	1691 1700	1710	1720	1730	1740	1750	1760	1770	1780	1790	1800	1810	1820
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	TCCAGGTCTG ATGACGGCTG accAcGgCTG	ATCACT <mark>GTT</mark> TCGA GTTACAC GTTaCaa	CTTCGTAAGG AATCGTCAAG aaTCGTaAaG	TCCTTCCCAG TTCTATGATGA TcCTaccaaGa	TTAGGTCCAA TGCATCCCG TacaTCCaa	GCACACCAGC GGA-TCAAGT GcA.aCaAGc	TTAGGGTCT TTTGGAATCT gTTaGaaTCT	CGTGTTGCCGC GGAGT cGaGT	GAATACTCT CATTCAAT aATaCaaT	CGGAGTACCI	AAGTCTCCTAC AC	CGAGAACTG AGAAAAC aGAaAAC	сттсст
	1821 1830	1840	1850	1860	1870	1880	1888						
OPJ_09_Japonicus1600 OPJ_09_Lupulus_1200 Consensus	CGGTCAT	TGTTAAAGTACTG TGTGCGACCTT TGTaaGaaCTg	GGTCGAC	TGATTTGG	TGTG	GTGAG	GCTCA						