

Evolution of *hes* gene family in vertebrates: the *hes5* cluster genes have specifically increased in frogs

Figure legends for additional materials

Table S1. The list of *hes* genes in *Danio rerio* and *Oryzias latipes*.

Fig. S1. Syntenic comparison with *hes1*, *6* and *hes7* gene loci

(A) Comparison of *hes1*, *6* loci among *Xenopus*, human and chicken. Paired curved blue arrows indicate flipping of genome sequences to align gene orders. A broken line circle indicates no gene model but the existence of homologous gene sequence, implying that the genome sequence is not complete or this might be a pseudogene. Pentagon arrows show genes with 5' to 3' direction. (B) Comparison of *hes1*, *6* loci among *Xenopus* and zebrafish. (C) Comparison with *hes7* gene genomic regions among *Xenopus*, human and chicken. (D) Comparison with *hes7* gene genomic regions between *Xenopus* and zebrafish. HSA, human; GGA, chicken; XTR, *Xenopus tropicalis*; XLA, *Xenopus laevis*; DRE, zebrafish.

Fig. S2. Multiple alignment of amino acid sequences of *hes5*

Multiple alignment of amino acid sequence of *hes5* was made by MUSCLE. Domain names and their boundaries are shown below the alignments. Asterisk show the conserved amino acid residues. Conserved Proline (P) residues are shown by red frames. Xela, *Xenopus laevis*; Xetr, *Xenopus tropicalis*; Hosa, human; Mumu, mouse; Gaga, chicken; Lach, coelacanth; Leoc, spotted gar; Dare, zebrafish; Orla, medaka; Cami, elephant shark.

Fig. S3. Multiple alignment of amino acid sequence of lamprey (Pema) and amphioxus (Brfl) *hes* genes

Domain names and their boundaries are shown below the alignments. Asterisk show the conserved amino acid residues. Conserved Proline (P) residues are shown by red frame.

Fig. S4. Detail phylogenetic tree of *hes* genes in sarcopterygian

Fig. S5. Detail phylogenetic tree of *hes* genes in teleosts

Fig. S6. Detail phylogenetic tree of *hes* genes in jawed vertebrates

Fig. S7. Detail phylogenetic tree of all *hes5* genes we observed

Fig. S8. Detail phylogenetic tree of all *hes5* genes in Tibetan frog

zebrafish gene name	Synonym (with detail information)	position	Xenopus gene
her12	Hes5c	Chromosome 23 reverse strand.	hes5
her4.2	fe18g04, Hes5d, si:ch73-21g5.3	Chromosome 23 reverse strand.	hes5
her4.4	si:ch73-21g5.5	Chromosome 23 reverse strand.	hes5
her9	Hes1a, wu:fc30a03, zgc:100766	Chromosome 23 reverse strand.	hes5
her4.3	si:ch73-21g5.4, wu:fe26g04	Chromosome 23 forward strand.	hes5
her4.1	ch73-21g5.2, her4, Hes5e, wu:fe18g04, wu:fq41c06, zgc:55218	Chromosome 23 reverse strand.	hes5
her4.2	fe18g04, Hes5d, si:ch73-21g5.3	Chromosome 23 forward strand.	hes5
her15.1	fk51a02, her15, her15a, hes5, wu:fk51a02, zgc:136520	Chromosome 11 forward strand.	hes5
her15.2	her15, her15b, hes5, hes5-like	Chromosome 11 reverse strand.	hes5
her2	Hes5a	Chromosome 11 reverse strand.	hes5
her3	hes3	Chromosome 8 forward strand.	hes3
her11	him	Chromosome 14 reverse strand.	hes7-3
her5	zgc:136537	Chromosome 14 forward strand.	hes7 (7-1)
her8.2	Hes8	Chromosome 15 forward strand.	hes6-2
her13	her11, her13.1, hes6b, zgc:110599	Chromosome 15 forward strand.	hes6-1
her1	etID309753.5, Hes7, id:ibd5086	Chromosome 5 reverse strand.	hes7-3
her7	cb715	Chromosome 5 forward strand.	hes7 (7-1)
her6	cb129, Hes1b	Chromosome 6 reverse strand.	hes1
her8a	her8b, wu:fb75f05, wu:fc06c04, zgc:85712	Chromosome 7 reverse strand.	hes6-2
hes6	her13.2	Chromosome 2 forward strand.	hes6
hes2.1	Hes2a, si:ch211-122n14.3	Chromosome 8 reverse strand.	hes2
hes2.2	Hes2b, zgc:153398	Chromosome 8 reverse strand.	hes2
medaka gene name	Synonym (with detail information)	position	Xenopus gene
her9	Hes4, Hes1a, wu:fc30a03, zgc:100766	Chromosome 7 forward strand.	(hes4)
her12	Hes5c	Chromosome 7 reverse strand.	hes5
her4.4	si:ch73-21g5.5	Chromosome 7 reverse strand.	hes5
hes2.2	Hes2b, zgc:153398	Chromosome 7 forward strand.	hes2
hes7	Oryzias latipes Her1-11 (LOC100049416) [Source: RefSeq mRNA; Acc: NM_001104797]	Chromosome 10 forward strand.	hes7-3
her5	zgc:136537	Chromosome 10 reverse strand.	hes7 (7-1)
her6.2	Oryzias latipes Her6.2 (LOC100049440) [Source:RefSeq mRNA; Acc: NM_001104814]	Chromosome 17 reverse strand.	(hes1)
hes6 (2of2)	bHLHb41	Chromosome 17 reverse strand.	hes6-1
her8.2	Hes8	Chromosome 13 forward strand.	hes6-2
hes6	Her13.2 [Source:RefSeq peptide; Acc: NP_001098282]	Chromosome 13 forward strand.	hes6-1
her7	cb715	Chromosome 16 reverse strand.	hes7 (7-1)
her6	cb129, Hes1b	Chromosome 4 reverse strand.	hes1

Sup.Table1

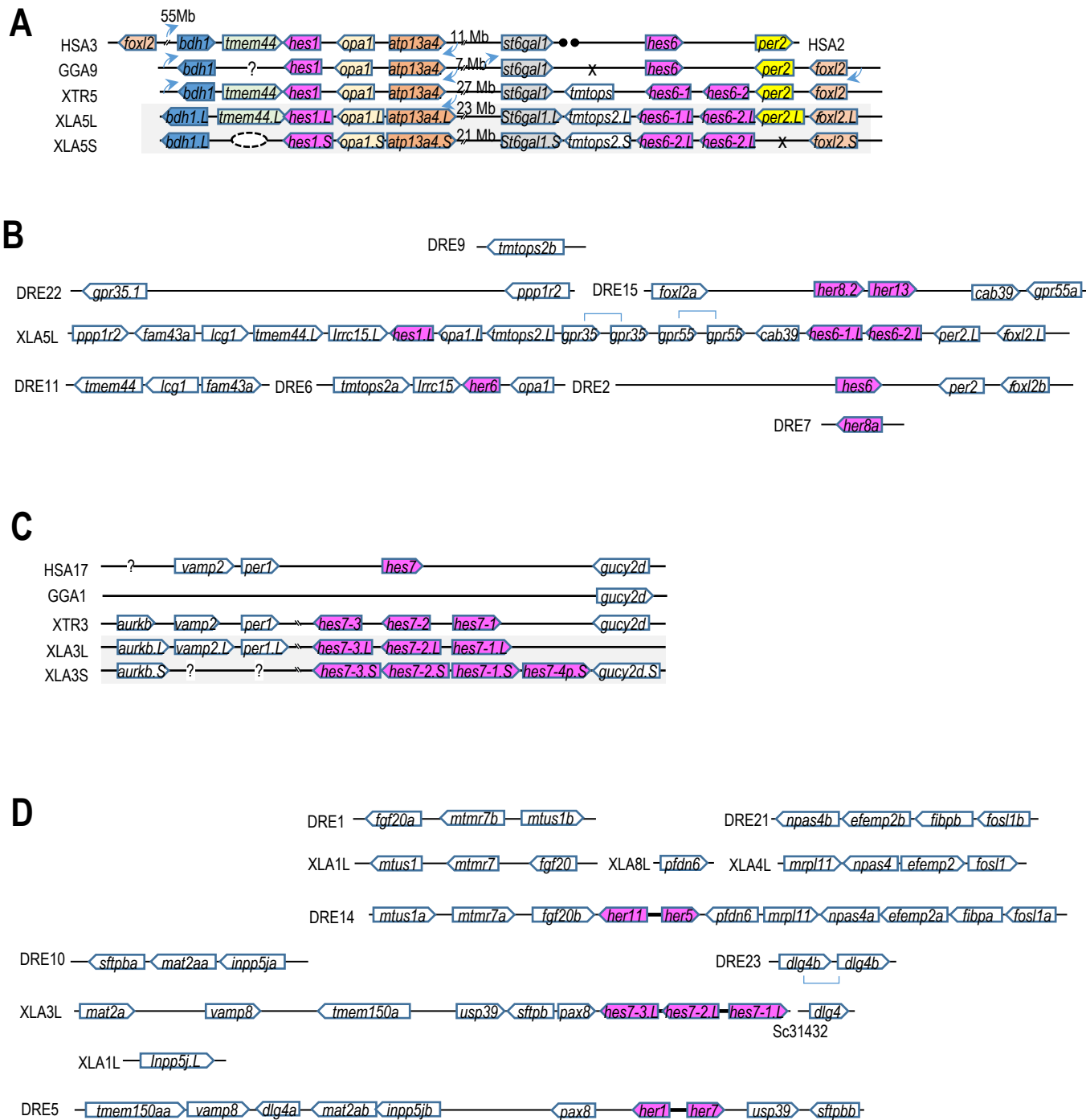


Fig. S1

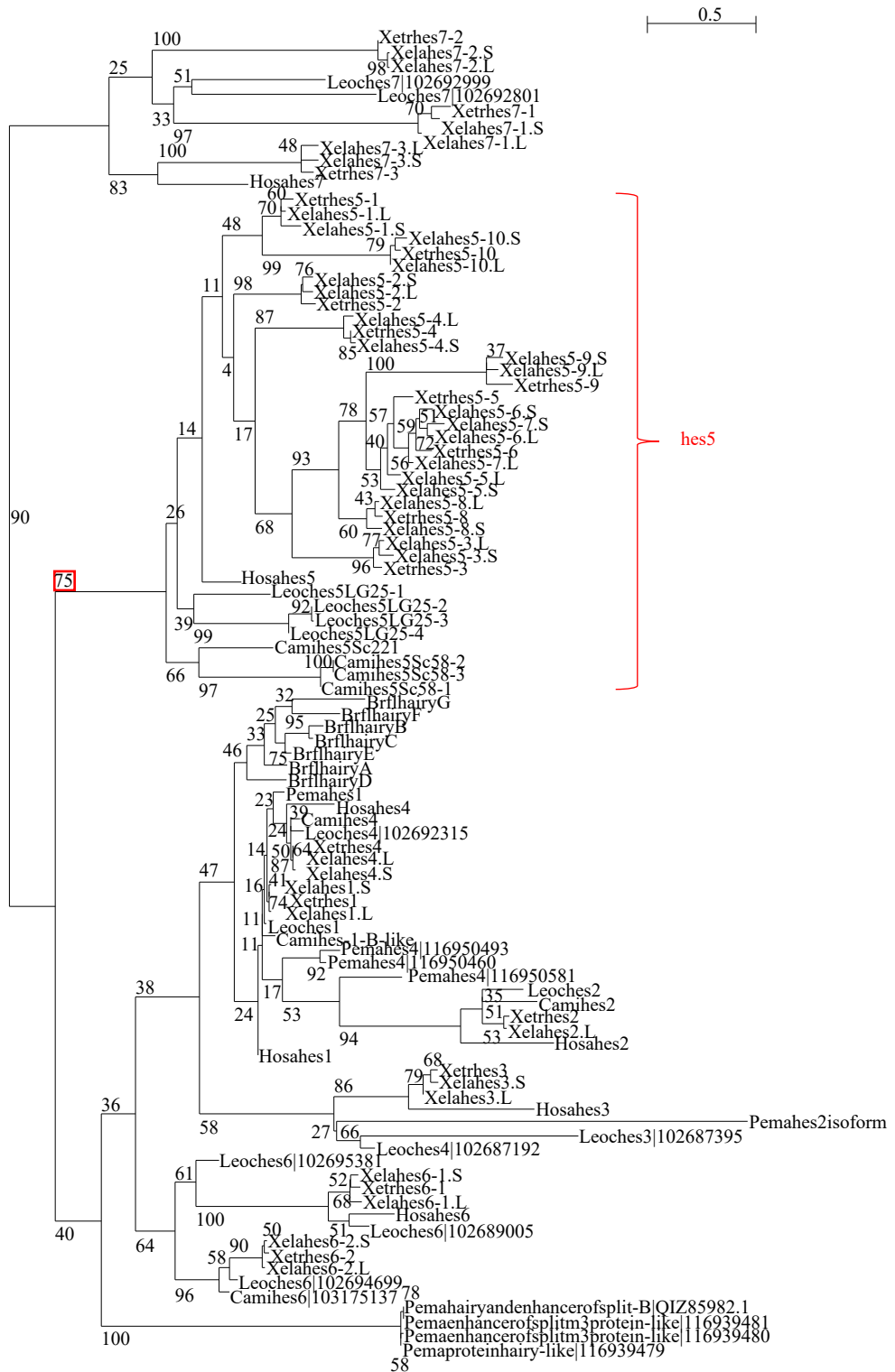


Fig.S6

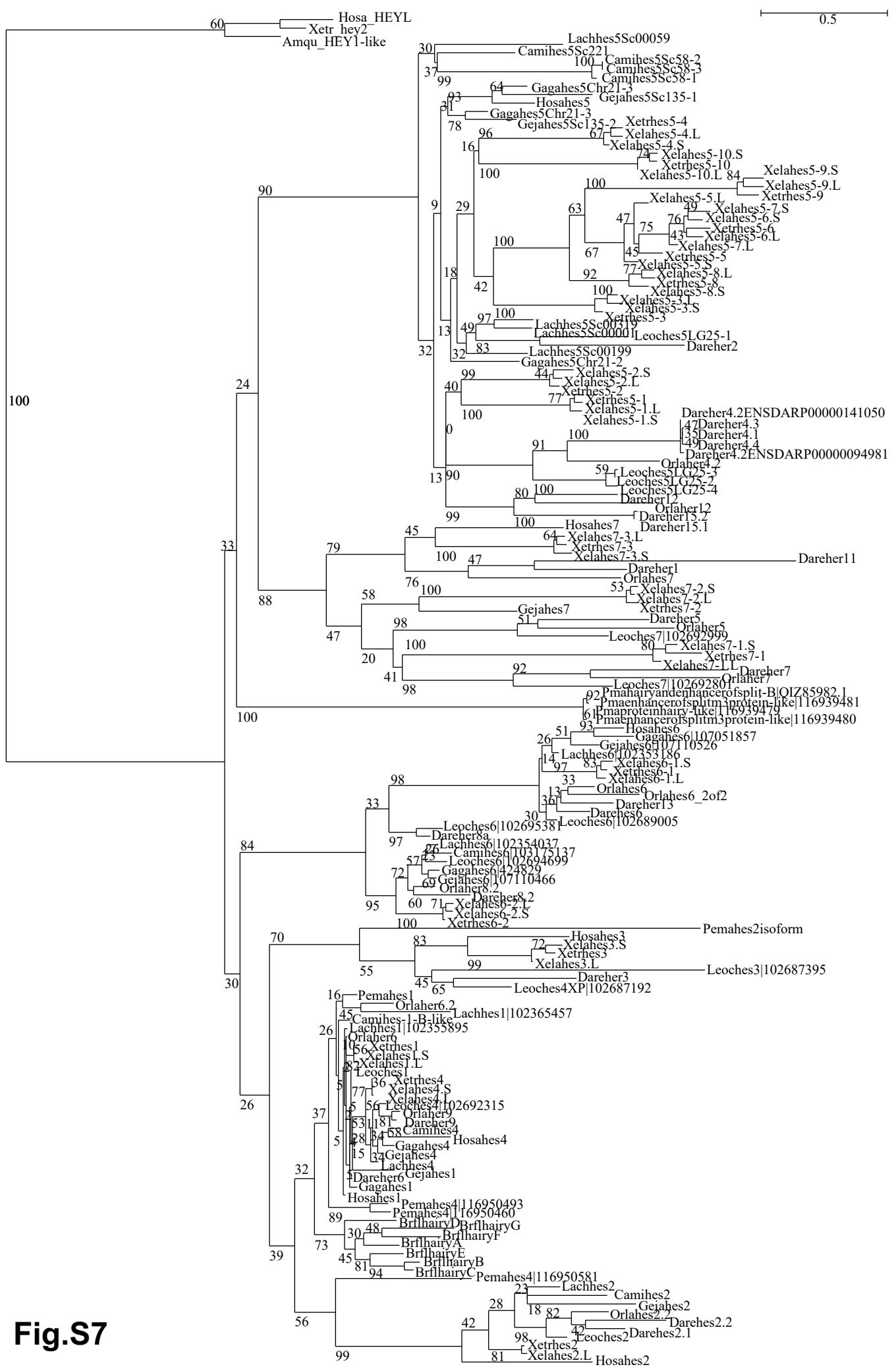


Fig.S7

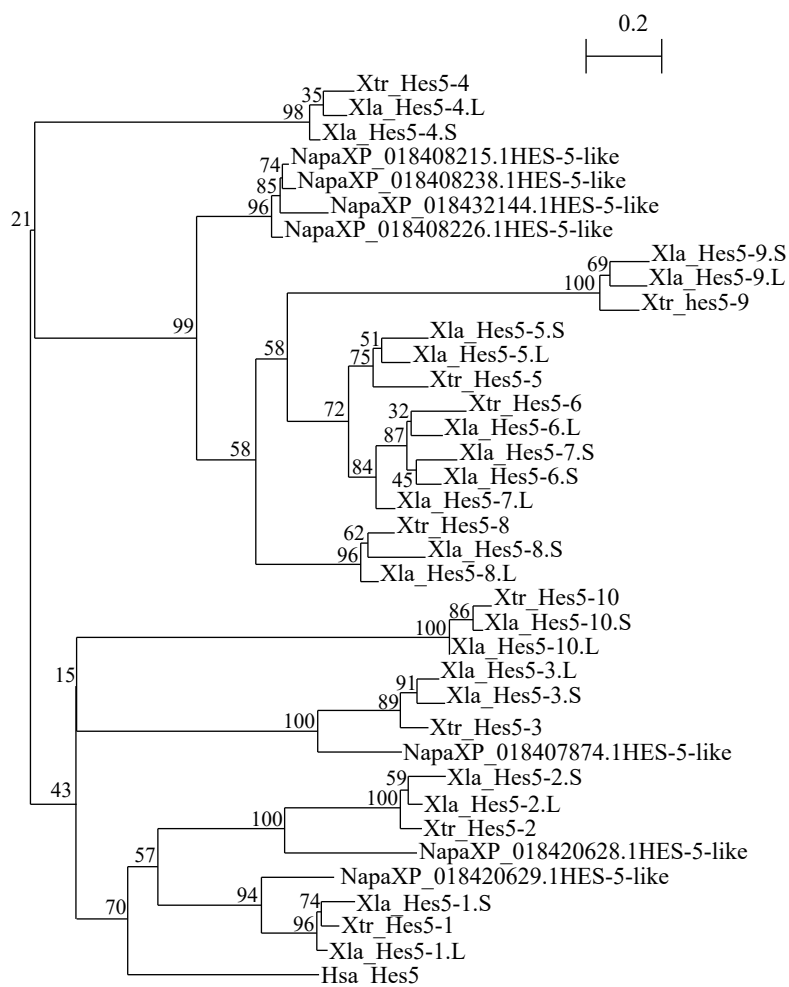


Fig.S8