

- Let's examine another example (from Zoonomia), where we downsample the genes down to 16 species (using **treemer**)
- Two genes that show evidence of episodic positive diversifying selection
 - One likely “real”
 - One likely “not real”
 - How can we tell?

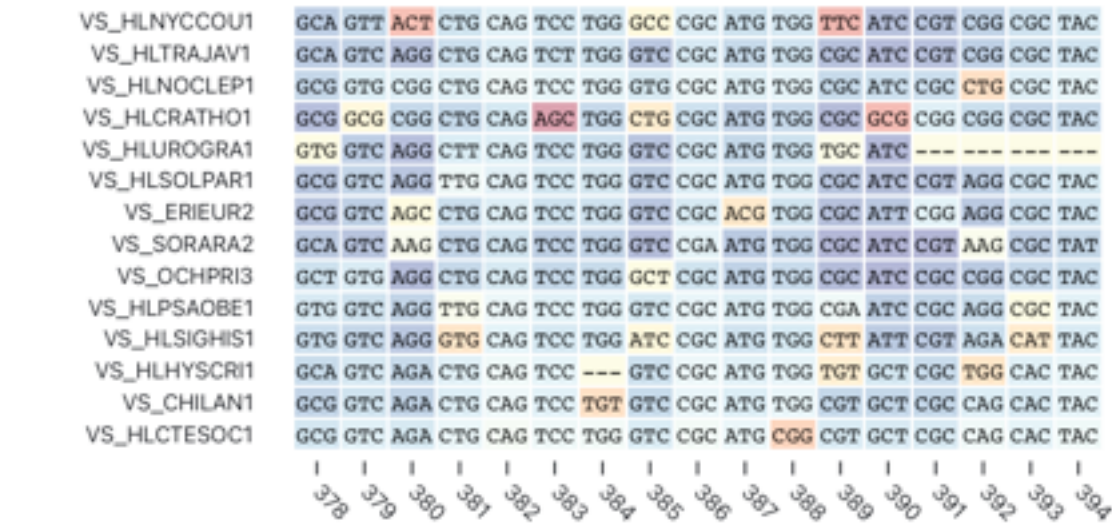
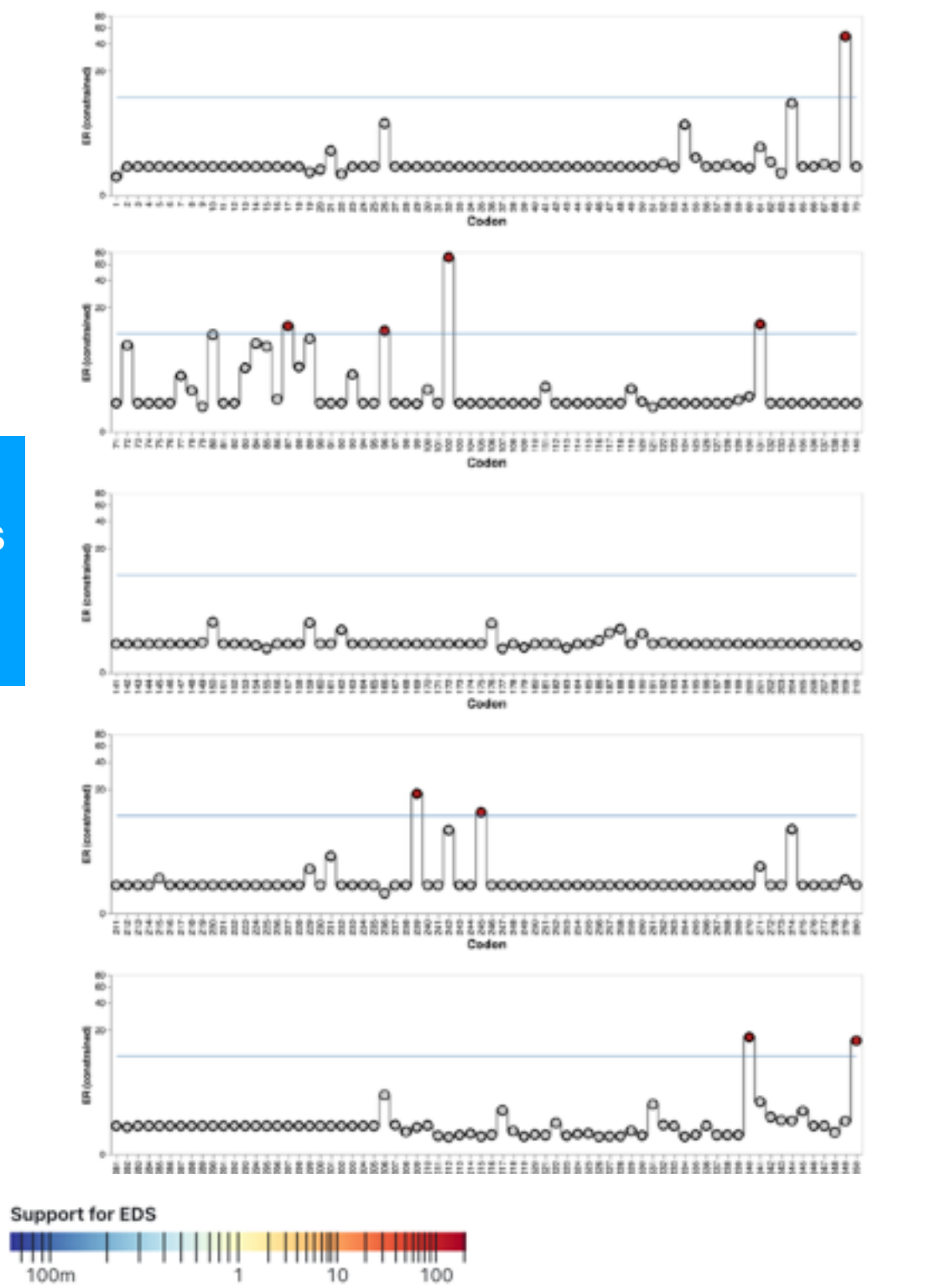
REAL

IQCF1

$\omega_1=0.4085$ (79.597%)
 $\omega_2=0.4078$ (15.784%)
 $\omega_3=11.16$ (4.6197%)

Reasonable ω value
with broad support

Nicely
dispersed sites
with evidence
of selection



VS_HILNYCAU1	GCA	T	ACT	CTG	CAG	TCC	TGG	GCC	CGC	ATG	TGG	TTC	ATC	CGT	CGG	CGC	TAC
VS_HLTRAJAV1	GCA	GTC	AGG	CTG	CAG	TCT	TGG	GTC	CGC	ATG	TGG	CGC	ATC	CGT	CGG	CGC	TAC
VS_HLNOCLEP1	GCG	GTC	CGG	CTG	CAG	TCC	TGG	GTC	CGC	ATG	TGG	CGC	ATC	CGC	CTG	CGC	TAC
VS_HLCRATHO1	GCG	GCG	CGG	CTG	CAG	AGG	TGG	CTG	CGC	ATG	TGG	CGC	GCG	CGG	CGG	CGC	TAC
VS_HLUROGRA1	GTG	GTC	AGG	CTT	CAG	TCC	TGG	GTC	CGC	ATG	TGG	TGC	ATC	---	---	---	---
VS_HLSOLPAR1	GCG	GTC	AGG	TTG	CAG	TCC	TGG	GTC	CGC	ATG	TGG	CGC	ATC	CGT	AGG	CGC	TAC
VS_ERIEUR2	GCG	GTC	AGC	CTG	CAG	TCC	TGG	GTC	CGC	ACG	TGG	CGC	ATT	CGG	AGG	CGC	TAC
VS_SORARA2	GCA	GTC	AAG	CTG	CAG	TCC	TGG	GTC	CGA	ATG	TGG	CGC	ATC	CGT	AAG	CGC	TAT
VS_OCHPRI3	GCT	GTC	AGG	CTG	CAG	TCC	TGG	GCT	CGC	ATG	TGG	CGC	ATC	CGC	CGG	CGC	TAC
VS_HLPSAOBE1	GTG	GTC	AGG	TTG	CAG	TCC	TGG	GTC	CGC	ATG	TGG	CGA	ATC	CGC	AGG	CGC	TAC
VS_HLSIGHIS1	GTG	GTC	AGG	GTG	CAG	TCC	TGG	ATC	CGC	ATG	TGG	CTT	ATT	CGT	AGA	CAT	TAC
VS_HLHYSCRI1	GCA	GTC	AGA	CTG	CAG	TCC	---	GTC	CGC	ATG	TGG	TGT	GCT	CGC	TGG	CAC	TAC
VS_CHILAN1	GCG	GTC	AGA	CTG	CAG	TCC	TGT	GTC	CGC	ATG	TGG	CGT	GCT	CGC	CAG	CAC	TAC
VS_HLCTESOC1	GCG	GTC	AGA	CTG	CAG	TCC	TGG	GTC	CGC	ATG	CGG	CGT	GCT	CGC	CAG	CAC	TAC
	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394

Standard BUSTED method results, $p \leq 0.001$ for both

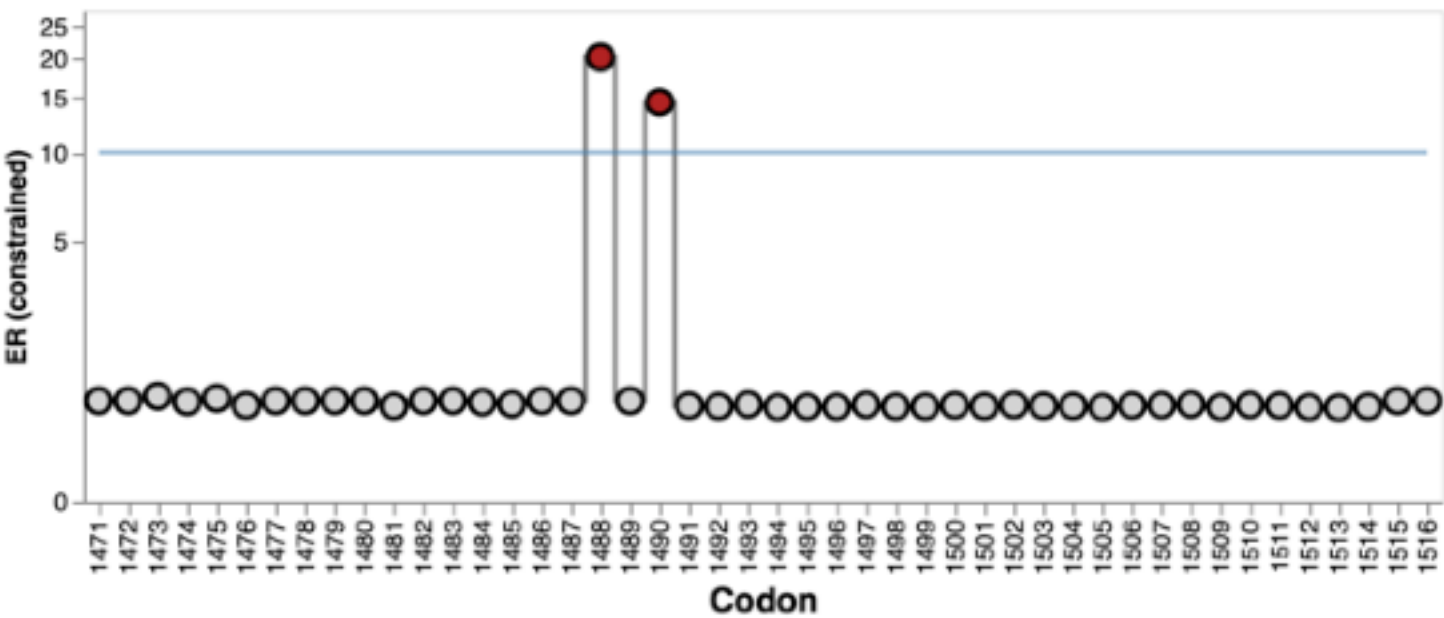
NOT REAL

KRT8

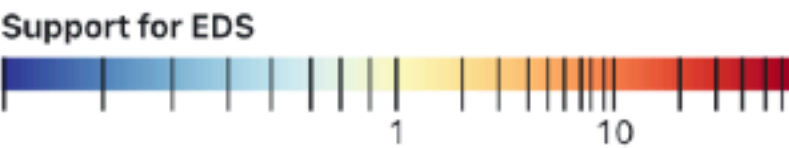
$\omega_1=0.02107$ (80.763%)
 $\omega_2=0.6961$ (18.533%)
 $\omega_3=136.3$ (0.70395%)

A large ω value with
narrow support

Evidence of
selection is
a localized
clump



Obvious alignment/
homology issues,
here in one sequence



VS_TUPBEL1	---	/	---	/	---	/	---	/	---	/	---	/	---	/	---	/	---	/	---	/	---	/	---	/	---	/	---	/
VS_OCHPRI3	---	/	---	/	AGC/S	TCC/S	TCC/S	AGC/S	---	/	---	/	TCC/S	CGA/R	---	/	---	/	GGC/G	AGC/S	AGC/S							
VS_HLPERLONPAC1	---	/	---	/	AGC/S	TCC/S	TCA/S	AGC/S	---	/	---	/	TCT/S	AGG/R	GTG/V	GGC/G	AGT/S	GGC/G	AGC/S									
VS_HLHYSCRI1	---	/	---	/	AGC/S	TCC/S	TCC/S	AGT/S	---	/	---	/	TCC/S	CGA/R	---	/	---	/	GGC/G	AGC/S	AGC/S							
VS_HLCTESOC1	---	/	---	/	AGC/S	TCT/S	TCC/S	AGC/S	---	/	---	/	TCC/S	AGA/R	---	/	---	/	GGC/G	AGC/S	AGC/S							
VS_HLTRAJAV1	---	/	---	/	AGC/S	TCC/S	TCG/S	ACC/T	---	/	---	/	ACC/T	CGA/R	---	/	---	/	GGC/G	AGC/S	GGC/G							
VS_HLCRATHO1	---	/	---	/	AGC/S	TCC/S	TCG/S	TCC/S	---	/	---	/	TCC/S	CGG/R	---	/	---	/	GGC/G	AGC/S	AGC/S							
VS_HLUROGRA1	---	/	AAC/N	CGC/R	ATC/I	AGC/S	TCC/S	---	/	TCG/S	TCC/S	TTC/F	---	/	GGC/G	CGA/R	GTG/V	GGA/G										
VS_HLSOLPAR1	---	/	---	/	AGC/S	TCC/S	TCC/S	TCC/S	---	/	---	/	TCC/S	CGG/R	---	/	---	/	GGC/G	AGC/S	AGC/S							
VS_ERIEUR2	---	/	---	/	AGC/S	CCC/P	TCC/S	GCC/A	---	/	---	/	TCC/S	CGG/R	---	/	---	/	GGC/G	AGC/S	AGC/S							
VS_SORARA2	---	/	---	/	AGC/S	TCC/S	TCC/S	ACC/T	---	/	---	/	ACC/T	CGG/R	---	/	---	/	GGC/G	AGC/S	ACC/T							
		10 ₀		10 ₀		10 ₀		10 ₀		10 ₀		10 ₀		20 ₀		20 ₀		20 ₀		20 ₀		20 ₀		20 ₀		20 ₀		20 ₀