SUPPORTING INFORMATION

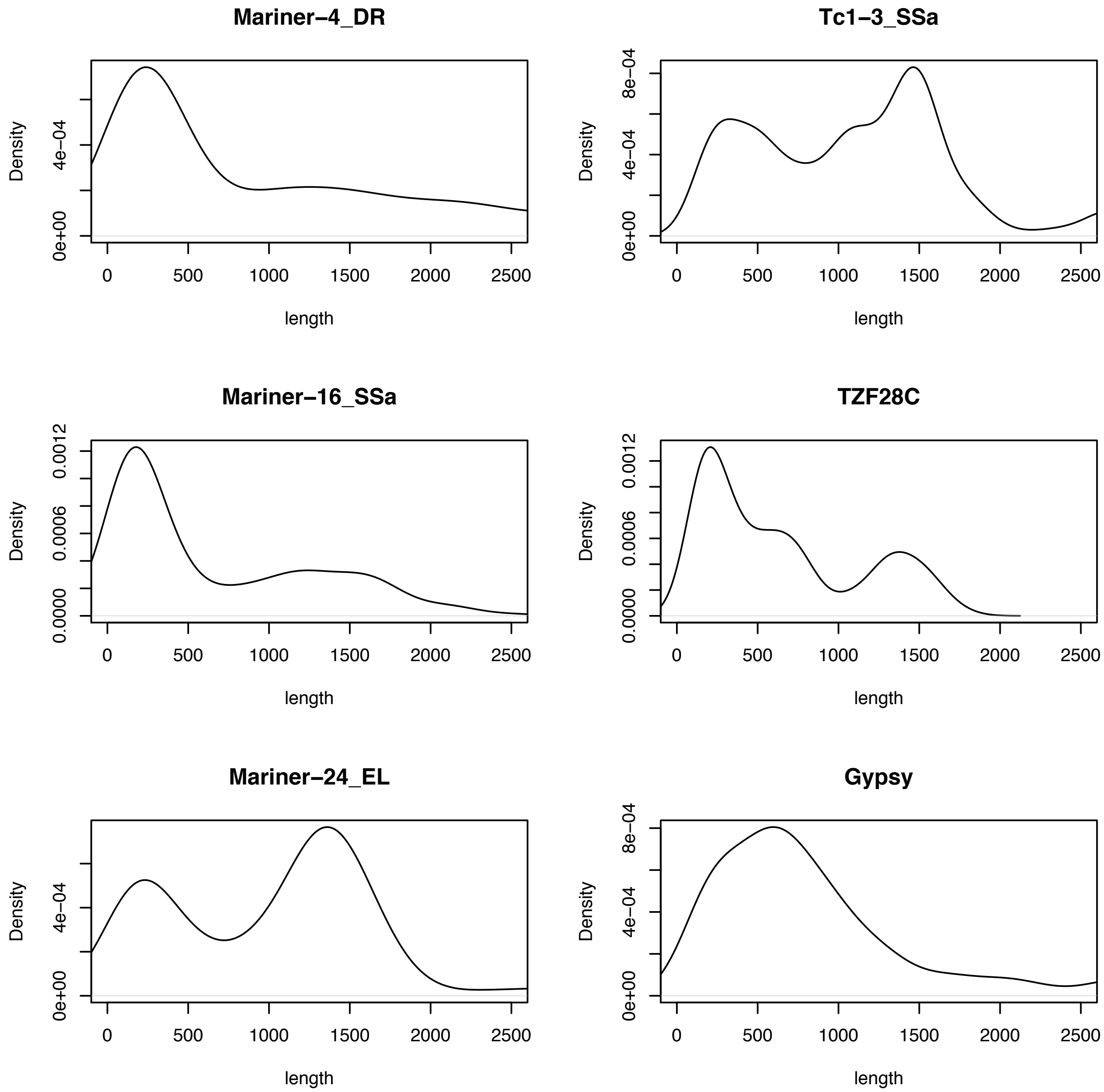

Figure S1 - . Length Distributions for Contigs assembled *Mariner, Tc1,* and *Gypsy* TE contigs. Some elements are assembled in fragments, contributing to non-normal length distributions.

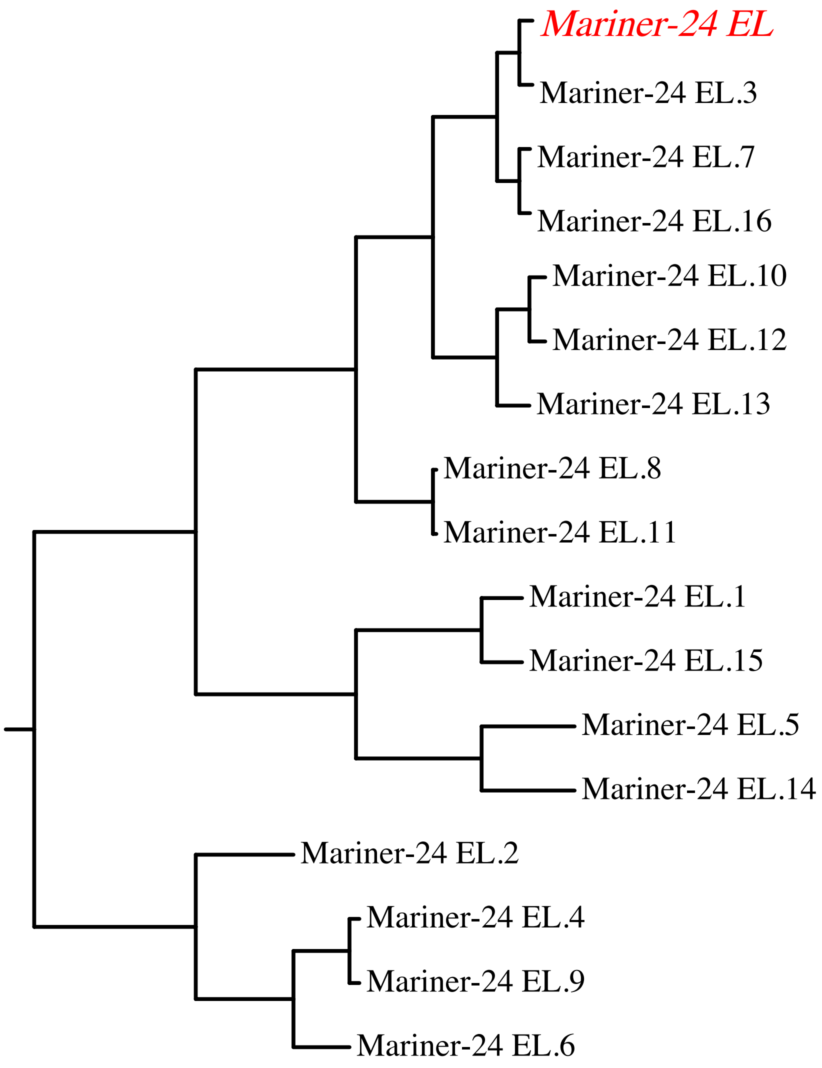

Fig S2 - Phylogenetic relationships between horizontally transmitted repetitive elements in *O. pumilio* (black) and annotated TE *Mariner-24_EL* (red), an *Esox lucius* TE in RepBase. Similar patterns are observed in other TE families. For each of the most diverse TEs that are candidates for horizontal transfer, the RepBase element lies within the diversity of TEs in *O._pumilio.* All of these diverse and rapidly proliferating horizontally transferred elements are a close match with a TE from freshwater fish.

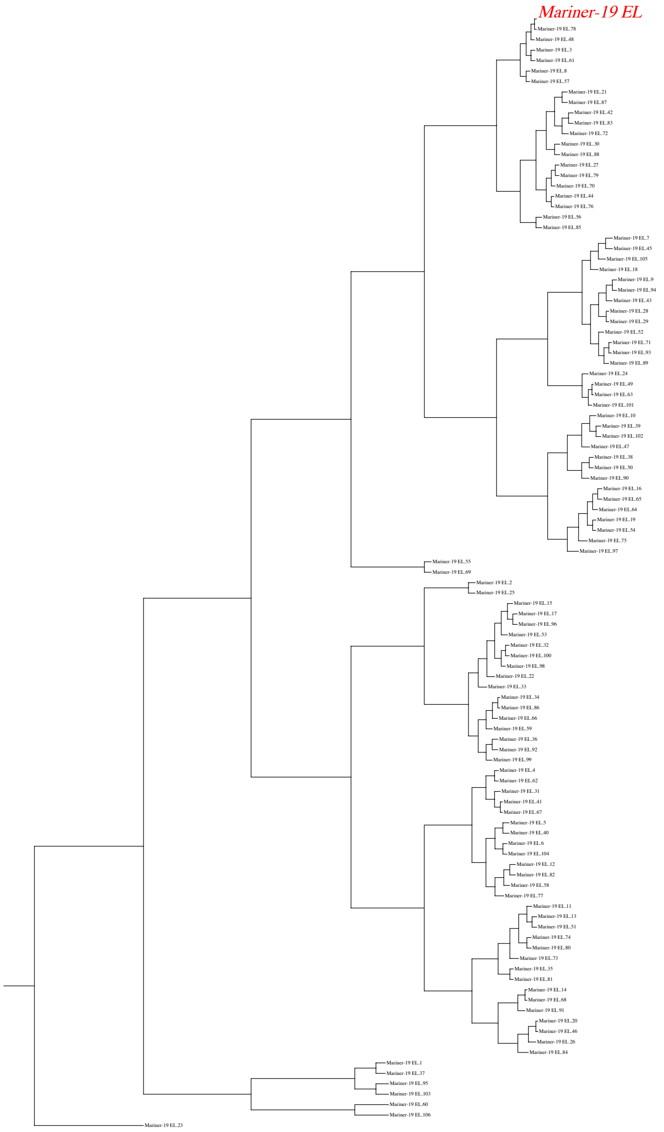

Figure S3- Phylogenetic relationships between horizontally transmitted repetitive elements in *O. pumilio* (black) and annotated TE *Mariner-19_EL* (red)*,* an *Esox lucius* TE in RepBase. Similar patterns are observed in other TE families. For each of the most diverse TEs that are candidates for horizontal transfer, the RepBase element lies within the diversity of TEs in *O._pumilio.* All of these diverse and rapidly proliferating horizontally transferred elements are a close match with a TE from freshwater fish.

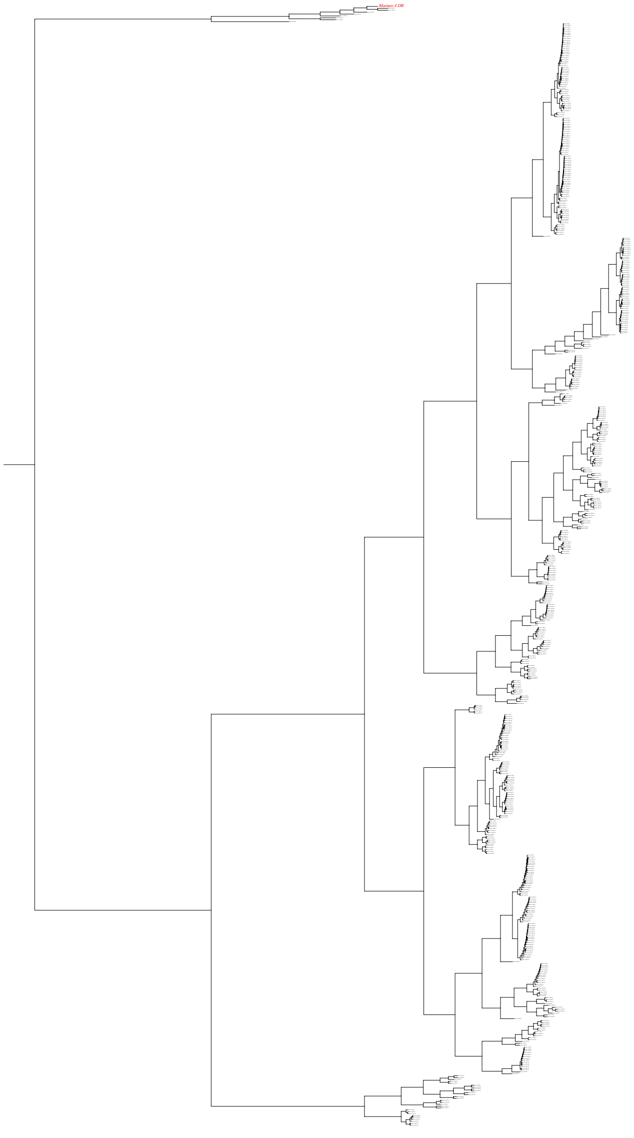

Figure S4- *Mariner-4_DR* phylogeny. For each of the most diverse TEs that are candidates for horizontal transfer, the RepBase element lies within the diversity of TEs in *O. pumilio.* All of these diverse and rapidly proliferating horizontally transferred elements are a close match with a TE from freshwater fish.

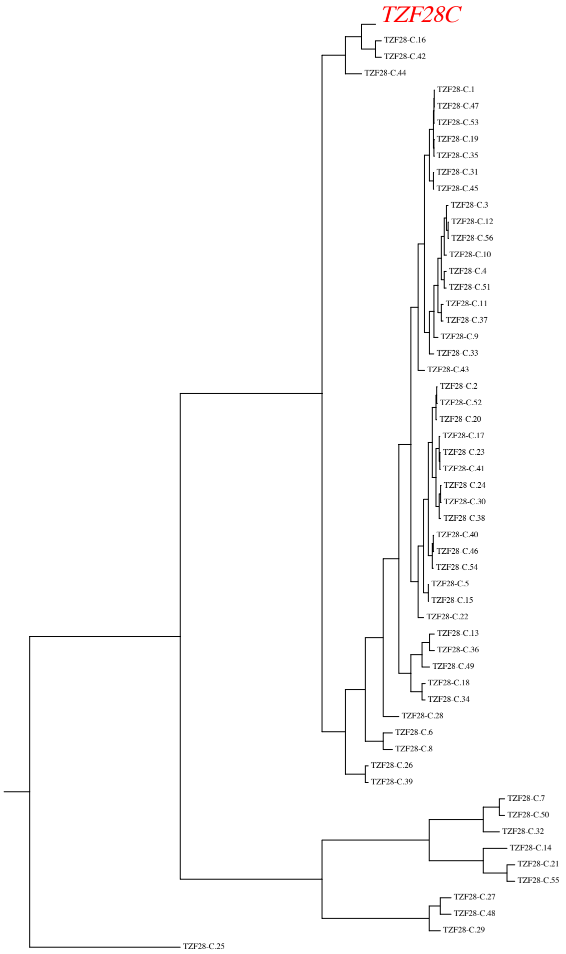

Figure S5 - TZF28C Phylogeny. For each of the most diverse TEs that are candidates for horizontal transfer, the RepBase element lies within the diversity of TEs in *O. pumilio*. All of these diverse and rapidly proliferating horizontally transferred elements are a close match with a TE from freshwater fish.

Figure S6 – *Mariner 16_SSa* phylogeny. For each of the most diverse TEs that are candidates for horizontal transfer, the RepBase element lies within the diversity of TEs in *O. pumilio*. All of these diverse and rapidly proliferating horizontally transferred elements are a close match with a TE from freshwater fish.

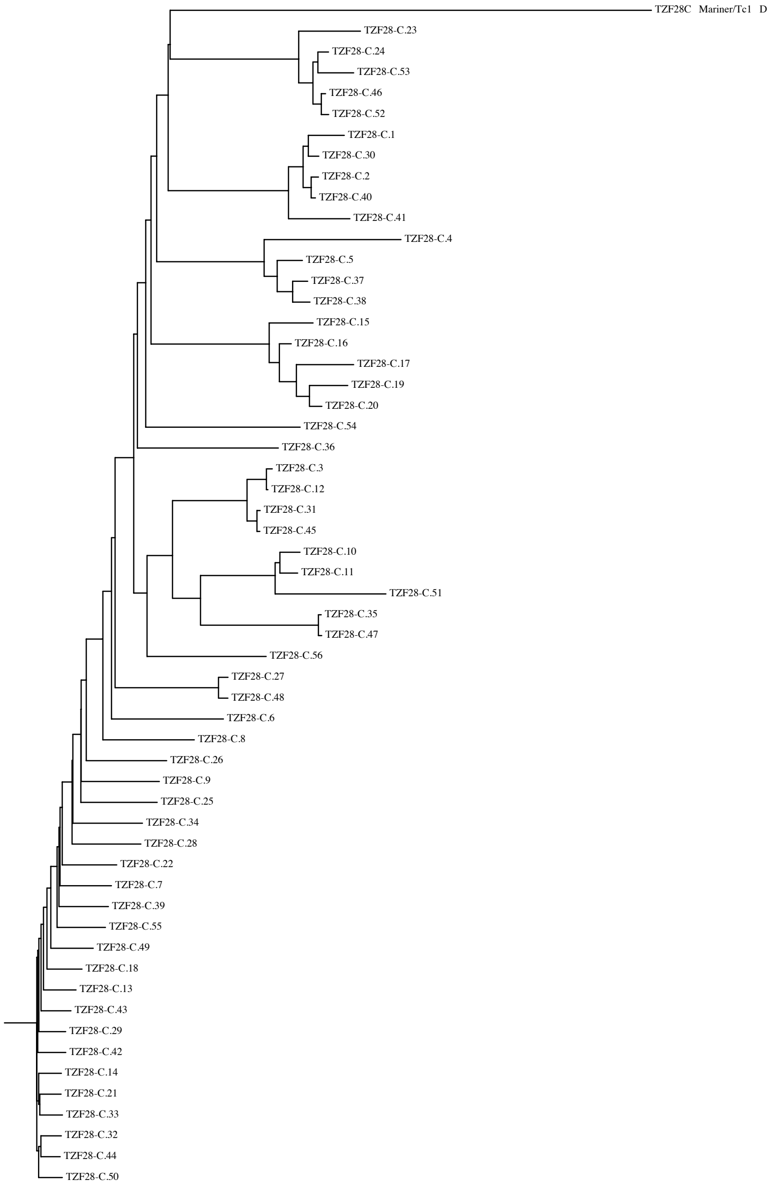

Figure S7 - Neighbor-joining relationships between horizontally transmitted repetitive elements in *O. pumilio* (black) and annotated *TZF28-C* , TE in RepBase.

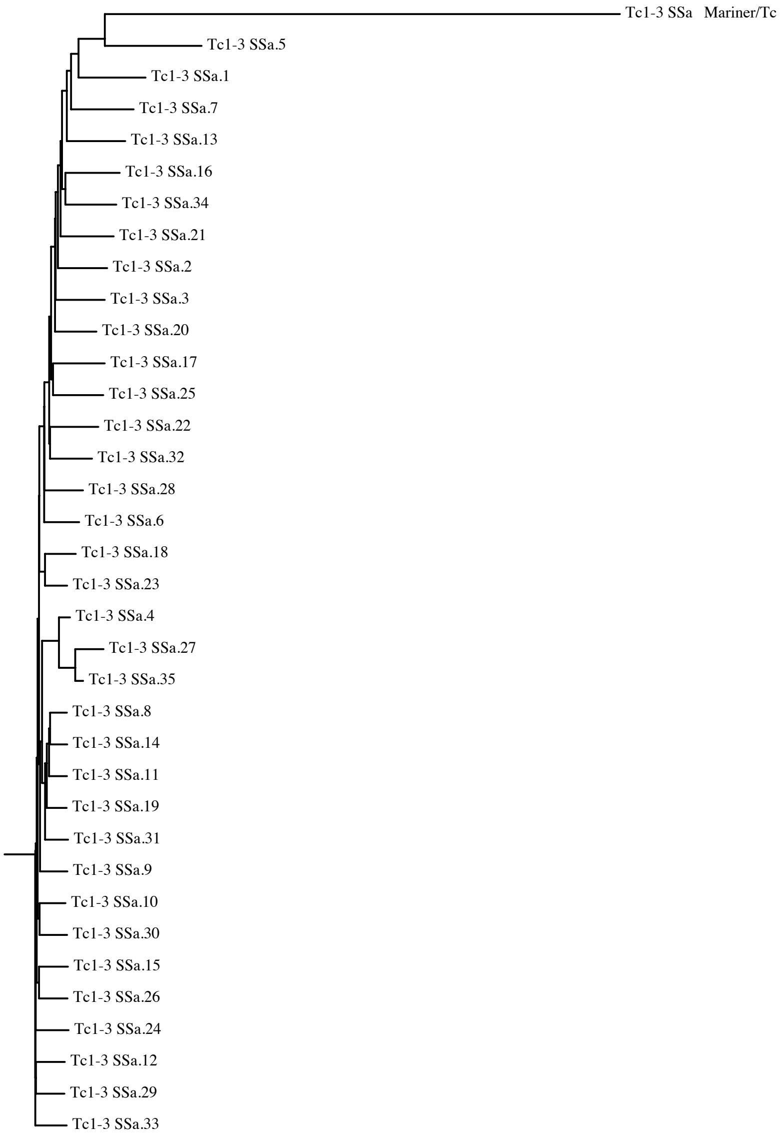

Fig S8 - Neighbor-joining relationships between horizontally transmitted repetitive elements in *O. pumilio* and annotated TE Tc1-3_SSa in RepBase.

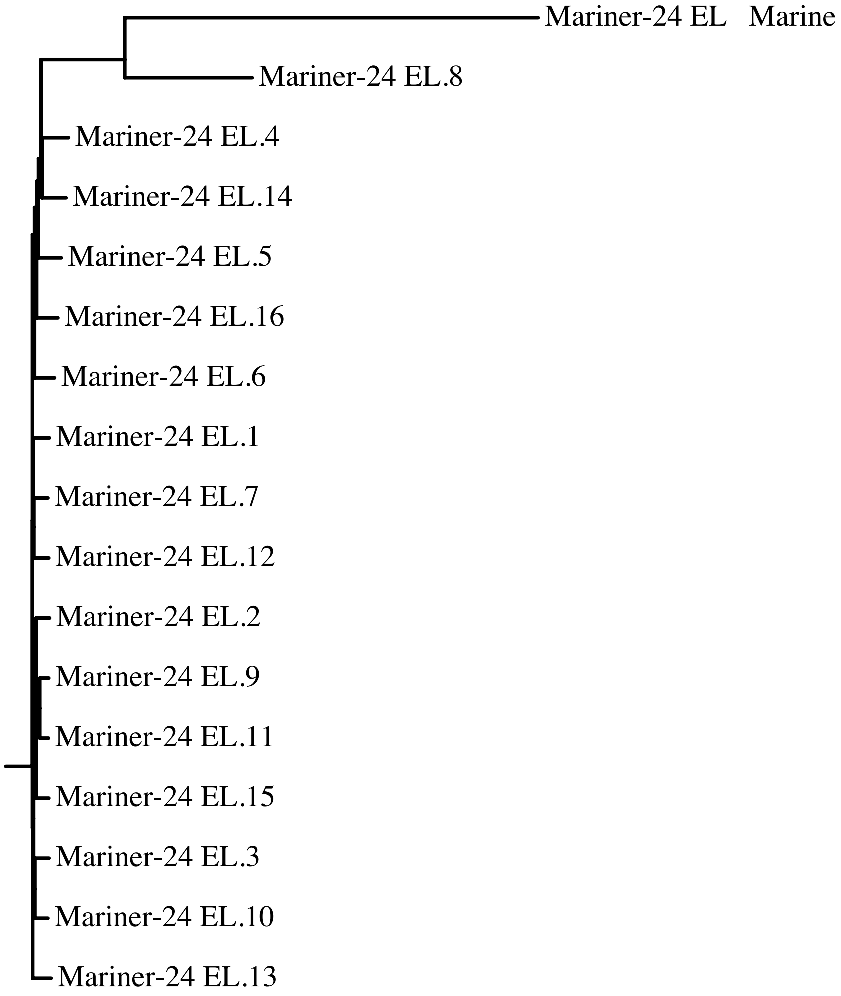

Figure S9 - Neighbor-joining relationships between horizontally transmitted repetitive elements in *O. pumilio* and annotated TE *Mariner-24_EL* in RepBase.

Fig S10 - Neighbor-joining relationships between horizontally transmitted repetitive elements in *O. pumilio* and annotated TE *Mariner-19_EL* TE in RepBase.

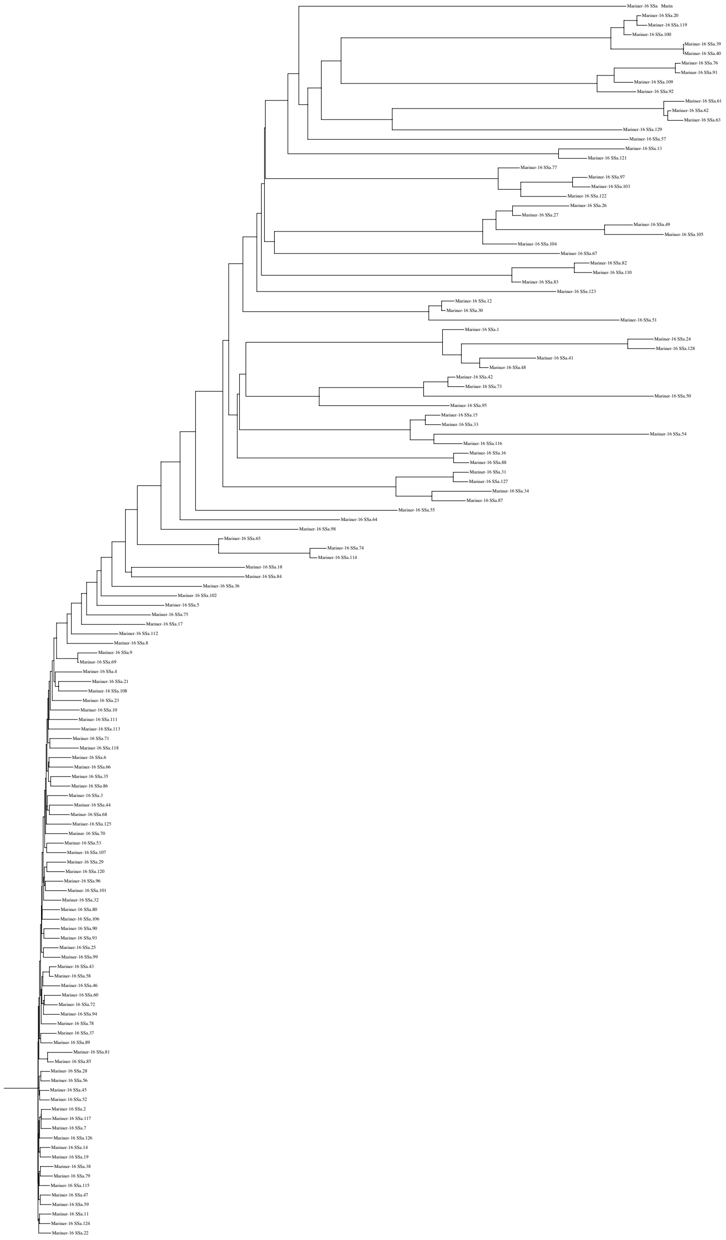

Fig S11 - Neighbor-joining relationships between horizontally transmitted repetitive elements in *O. pumilio* (black) and annotated TE *Mariner-16_SSa* TE in RepBase.

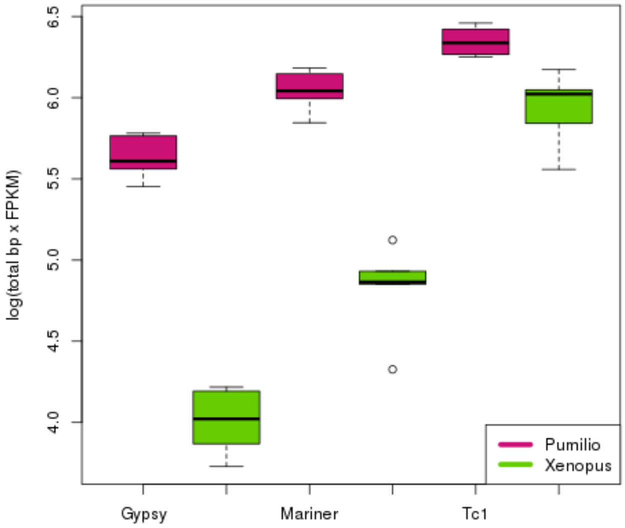

Figure S12 - Expression data considering only expression level, not sequence length for TEs in *O. pumilio* oocytes. Expression levels for TE classes in *O. pumilio* and *Xenopus laevis*. *Gypsy* and *Mariner* elements are expressed at significantly higher levels in *O. pumilio,* but *Tc1* elements are not.

Table S1. Transposable element content for TEs in the *O. pumilio assembly*

TE Family	Total bp	TE Type
Gypsy	1,036,288,222	LTR Retrotransposon
Copia	297,874,058	LTR Retrotransposon
hAT	255,508,647	DNA Transposon
Mariner	197,322,803	DNA Transposon
Tc1	181,804,487	DNA Transposon

Table S2. Highest copy number repeats in the *O. pumilio* sequence data

TE Family	**Copy Number**
Mariner-9_SSa	10640
Tc1-9_Xt	10853
U6	11134
Gypsy-60_GA-I	12184
Mariner-5_EL	12579
Mariner-16_SSa	14020
SINE2-1_XT	15251
Tc1-12_Xt	18727
Mariner-24_EL	22021
Tc1-15_Xt	25551
Tc1-2_Xt	26527
TZF28C	29893
Gypsy-15_Ano-I	58354
Mariner-4_DR	73395
Tc1-3_SSa	78037

Table S3. Most highly expressed TE transcripts in the *O. pumilio* genome.

Transposon Type	**Expression (FPKM)**
Tc1-3_SSa	2001
Tc1-3_SSa	1228
Tc1-3_SSa	1032
Tc1-2_Xt	366
Gypsy-15_Ano-I	352
TZF28B	333
Tc1-3_SSa	277
TE-5_EL	266
Mariner-4_DR	253
Gypsy-60_GA-I	240
Tc1-2_Xt	223
Mariner-13_SSa	211
Tc1-3_SSa	204
TE-5_EL	203
Mariner-8_EL	199
Mariner-13_SSa	176
SINE2-1_XT	170
Tc1-1_OL	162
Tc1-2_Xt	152
Tc1-9_Xt	150
Mariner-19_SSa	135
Tc1-3_SSa	116
Mariner-2_SSa	114
Tc1-9_Xt	110
Mariner-9B_EL	107
MER34B_I	107