

Table S1. Leech species, host species, GenBank accession number, reference, and collection location for all CO1 data from GenBank used in phylogeny reconstruction. *Leucophenga* sp. (KP697105, Huang & Chen 2016) and *Uenoa lobata* (KY582937, J. Xu & B. Wang unpubl. data) were used as outgroups (not included in table).

Leech species	Host species	Accession no.	Reference	Collection location
<i>Ozobranchus margoi</i>	<i>Caretta caretta</i>	AF003268	Siddall & Burreson 1998	Virginia, USA
	<i>Caretta caretta</i>	KJ451405	Tseng et al. 2017	Taiwan
	<i>Chelonia mydas</i>	HM590711	McGowin et al. 2011	Florida, USA
<i>Ozobranchus branchiatus</i>	<i>Chelonia mydas</i>	GU985465	McGowin et al. 2011	Florida, USA
	<i>Chelonia mydas</i>	KF728206	Truong 2014	Florida, USA
	<i>Chelonia mydas</i>	KF728208	Truong 2014	Hawaii, USA
	<i>Chelonia mydas</i>	KF728209	Truong 2014	Hawaii, USA
	<i>Chelonia mydas</i>	KF728210	Truong 2014	Hawaii, USA
	<i>Chelonia mydas</i>	KF728213	Truong 2014	Hong Kong
	<i>Chelonia mydas</i>	KJ451401	Tseng et al. 2017	Taiwan
	<i>Caretta caretta</i>	GU985466	McGowin et al. 2011	Florida, USA
	<i>Lepidochelys olivacea</i>	KF728211	Truong 2014	Mexico
	<i>Lepidochelys olivacea</i>	KF728212	Truong 2014	Mexico
	Unspecified	KJ451399	Tseng et al. 2017	Taiwan
	Unspecified	KJ451400	Tseng et al. 2017	Taiwan
	Unspecified	KJ451401	Tseng et al. 2017	Taiwan
	Unspecified	KJ451402	Tseng et al. 2017	Taiwan
	Unspecified	KJ451403	Tseng et al. 2017	Taiwan
Unspecified	KJ451404	Tseng et al. 2017	Taiwan	
<i>Ozobranchus jantseanus</i>	<i>Mauremys reevesii</i>	LC215640	Nakano et al. 2017	Japan
	<i>Mauremys reevesii</i>	LC215662	Nakano et al. 2017	Japan
	<i>Mauremys reevesii</i>	LC215672	Nakano et al. 2017	Japan
	<i>Mauremys reevesii</i>	LC215685	Nakano et al. 2017	Japan
	Unspecified	KY861060	Liu et al. 2017	China

Table S2. Leech species, host species, GenBank accession number, chelonid alphaherpesvirus (ChHV5) status of leech, collection location, host ID, and host fibropapillomatosis (FP) status for all leech sequences generated in this study. ChHV5-positive leeches and FP-positive hosts are indicated by plus signs. Specimens were collected in the Indian River Lagoon, Florida, USA (IRL), and in the Trident Submarine Basin, Florida, USA (Trident) in 2017-2018.

Leech species	Host species	Accession no.	Leech ChHV5 status	Collection location	Host ID	Host FP status
<i>Ozobranchus margo</i>	<i>Caretta caretta</i>	MN481288		Trident	unknown	
	<i>Caretta caretta</i>	MN481289		IRL	53639	+
	<i>Caretta caretta</i>	MN481290		Trident	unknown	
	<i>Caretta caretta</i>	MN481291		IRL	53639	+
	<i>Caretta caretta</i>	MN481292		IRL	53639	+
	<i>Caretta caretta</i>	MN481293	+	IRL	53639	+
	<i>Caretta caretta</i>	MN481294		IRL	53639	+
	<i>Caretta caretta</i>	MN481295	+	IRL	53639	+
	<i>Caretta caretta</i>	MN481296	+	IRL	53639	+
	<i>Caretta caretta</i>	MN481297		IRL	53639	+
	<i>Caretta caretta</i>	MN481298		IRL	53639	+
	<i>Caretta caretta</i>	MN481299		IRL	53639	+
	<i>Caretta caretta</i>	MN481300		IRL	53639	+
	<i>Caretta caretta</i>	MN481301		IRL	53639	+
	<i>Caretta caretta</i>	MN481302		IRL	53639	+
	<i>Caretta caretta</i>	MN481303		IRL	53639	+
	<i>Caretta caretta</i>	MN481304		Trident	unknown	
	<i>Caretta caretta</i>	MN481305		IRL	53639	+
	<i>Caretta caretta</i>	MN481306		IRL	53639	+
	<i>Caretta caretta</i>	MN481307		IRL	53639	+
	<i>Caretta caretta</i>	MN481308	+	IRL	53639	+
	<i>Caretta caretta</i>	MN481309	+	IRL	53639	+
	<i>Ozobranchus branchiatus</i>	<i>Chelonia mydas</i>	MN481310		IRL	52016
<i>Chelonia mydas</i>		MN481311	+	IRL	52202	+
<i>Chelonia mydas</i>		MN481312		IRL	52202	+
<i>Chelonia mydas</i>		MN481313		IRL	52207	+
<i>Chelonia mydas</i>		MN481314		IRL	53245	+
<i>Chelonia mydas</i>		MN481315	+	IRL	52541	+
<i>Chelonia mydas</i>		MN481316		IRL	52203	
<i>Chelonia mydas</i>		MN481317		IRL	52225	
<i>Chelonia mydas</i>		MN481318		IRL	54856	+
<i>Chelonia mydas</i>		MN481319		IRL	52228	+
<i>Chelonia mydas</i>		MN481320		IRL	54857	
<i>Chelonia mydas</i>		MN481321		IRL	52205	
<i>Chelonia mydas</i>		MN481322	+	IRL	52199	
<i>Chelonia mydas</i>		MN481323		IRL	53245	+
<i>Chelonia mydas</i>		MN481324		IRL	52205	
<i>Chelonia mydas</i>		MN481325		IRL	52205	
<i>Chelonia mydas</i>		MN481326		IRL	52205	
<i>Chelonia mydas</i>	MN481327		IRL	52205		
<i>Chelonia mydas</i>	MN481328	+	IRL	52197	+	
<i>Chelonia mydas</i>	MN481329		IRL	52225		

Leech species	Host species	Accession no.	Leech ChHV5 status	Collection location	Host ID	Host FP status
	<i>Chelonia mydas</i>	MN481330		IRL	52227	+
	<i>Chelonia mydas</i>	MN481331		IRL	53245	+
	<i>Chelonia mydas</i>	MN481332		IRL	52205	
	<i>Chelonia mydas</i>	MN481333		IRL	52234	+
	<i>Chelonia mydas</i>	MN481334		IRL	52198	+
	<i>Chelonia mydas</i>	MN481335		IRL	52202	+
	<i>Chelonia mydas</i>	MN481336		IRL	52203	
	<i>Chelonia mydas</i>	MN481337		IRL	52203	
	<i>Chelonia mydas</i>	MN481338		IRL	52203	
	<i>Chelonia mydas</i>	MN481339		IRL	52203	
	<i>Chelonia mydas</i>	MN481340		IRL	53244	+
	<i>Chelonia mydas</i>	MN481341		IRL	52205	
	<i>Chelonia mydas</i>	MN481342		IRL	52203	
	<i>Chelonia mydas</i>	MN481343		IRL	52540	+
	<i>Chelonia mydas</i>	MN481344		IRL	53244	+
	<i>Chelonia mydas</i>	MN481345		IRL	53253	
	<i>Chelonia mydas</i>	MN481346		IRL	54857	
	<i>Chelonia mydas</i>	MN481347		IRL	52203	
	<i>Chelonia mydas</i>	MN481348		IRL	53245	+
	<i>Chelonia mydas</i>	MN481349	+	IRL	52204	+
	<i>Chelonia mydas</i>	MN481350		IRL	53252	+
	<i>Chelonia mydas</i>	MN481351	+	IRL	52204	+
	<i>Chelonia mydas</i>	MN481352		IRL	52016	+
	<i>Chelonia mydas</i>	MN481353	+	IRL	52232	+
	<i>Chelonia mydas</i>	MN481354		IRL	53245	+
	<i>Chelonia mydas</i>	MN481355		IRL	53245	+
	<i>Chelonia mydas</i>	MN481356		IRL	52198	+
	<i>Chelonia mydas</i>	MN481357		IRL	52198	+
	<i>Chelonia mydas</i>	MN481358		IRL	52206	
	<i>Chelonia mydas</i>	MN481359		IRL	52225	
	<i>Chelonia mydas</i>	MN481360		IRL	52538	+
	<i>Chelonia mydas</i>	MN481361	+	IRL	52240	+
	<i>Chelonia mydas</i>	MN481362	+	IRL	52204	+
	<i>Chelonia mydas</i>	MN481363		IRL	56338	+
	<i>Chelonia mydas</i>	MN481364		IRL	52229	

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