

Table S1. *Aquatica* species and distribution.

Species	Mainland China	Formosa Taiwan/	Japan	Location of types	Larvae associated	Females associated	References for pictures of species
<i>A. ficta</i> (Olivier, 1909)	*	*		MNHN	√	√	[1,4,13]
<i>A. hydrophila</i> (Jeng <i>et al.</i> , 2003)		*		NMNS	√	√	[1,16]
<i>A. lateralis</i> (Motschulsky, 1860)	*		*	ZMUM	√	√	[1,4,13]
<i>A. leii</i> (Fu <i>et al.</i> 2006)	*			NHMHAU	√	√	[1,13]
<i>A. qingshen</i> sp. nov.	*			NHMHAU	√	√	This study
<i>A. wuhana</i> (Fu <i>et al.</i> 2010)	*			NHMHAU	√	√	[1,13]
<i>A. xianning</i> sp. nov.	*			NHMMAU	√	√	This study

* Distribution; √ confirmation

Table S2. *Aquatica* females and characteristics.

Species	1	2	3	4	5	6	7
<i>A. leii</i> (Fu <i>et al.</i> 2006)	E	H	In cop	strips	√	√	√
<i>A. ficta</i> (Olivier, 1909)	E	H	In cop	strips	√	√	√
<i>A. hydrophila</i> (Jeng <i>et al.</i> , 2003)	E	H	In cop	NI	NI	NI	NI
<i>A. lateralis</i> (Motschulsky, 1860)	E	H	In cop	strips	√		
<i>A. qingshen</i> sp. nov.	E	H	In cop	strips	√		√
<i>A. wuhana</i> (Fu <i>et al.</i> 2010)	E	H	In cop	strips	√	√	√
<i>A. xianning</i> sp. nov.	E	H	In cop.	strips	√		√

* 1. Elytra. E = fully developed. 2. Hind wings. H = fully developed. 3. Evidence for association. 4. Bursa plates. 5. Median oviduct plate. 6. Spermatophore observed. 7. FAG observed. NI = not investigated.

Table S3. Matrix p-distance of 20 species of fireflies.

Species	<i>Ab.anceyi</i>	<i>Ab.cerata</i>	<i>Ab.terminalis</i>	<i>Aq.ficta</i>	<i>Aq.lateralis japonese</i>	<i>Aq.lateralis chinese</i>	<i>Aq. leii</i>	<i>Aq. xianning</i>	<i>Aq. qingshen</i>	<i>Aq.wuhana</i>	<i>As. circumdata</i>	<i>C. bilineatus</i>	<i>C. costipennis</i>	<i>C. fulvocapitalis</i>	<i>L. curtithorax</i>	<i>N. cruciata</i>	<i>Pt.maipo</i>	<i>Pyg.qingyu</i>	<i>Pyr.rufa</i>	<i>S. substriata</i>
<i>Ab.anceyi</i>	0.0000																			
<i>Ab.cerata</i>	0.1940	0.0000																		
<i>Ab.terminalis</i>	0.1591	0.1133	0.0000																	
<i>Aq.ficta</i>	0.2660	0.1718	0.1778	0.0000																
<i>Aq.lateralis japonese</i>	0.2803	0.1828	0.1897	0.1280	0.0000															
<i>Aq.lateralis chinese</i>	0.2679	0.1769	0.1807	0.1300	0.0945	0.0000														
<i>Aq. leii</i>	0.2675	0.1729	0.1786	0.0036	0.1290	0.1303	0.0000													
<i>Aq. xianning</i>	0.2846	0.1917	0.1954	0.1415	0.1517	0.1517	0.1420	0.0000												
<i>Aq. qingshen</i>	0.2714	0.1815	0.1857	0.1267	0.1415	0.1418	0.1271	0.1084	0.0000											
<i>Aq.wuhana</i>	0.2622	0.1707	0.1791	0.1211	0.1430	0.1421	0.1215	0.1544	0.1395	0.0000										
<i>As. circumdata</i>	0.2925	0.2022	0.2084	0.2170	0.2270	0.2219	0.2181	0.2319	0.2177	0.2211	0.0000									
<i>C. bilineatus</i>	0.3021	0.2071	0.2155	0.2238	0.2351	0.2314	0.2248	0.2361	0.2298	0.2244	0.2406	0.0000								
<i>C. costipennis</i>	0.3024	0.2015	0.2128	0.2238	0.2343	0.2300	0.2251	0.2400	0.2264	0.2212	0.2357	0.0814	0.0000							
<i>C. fulvocapitalis</i>	0.2953	0.2120	0.2202	0.2292	0.2405	0.2360	0.2295	0.2481	0.2378	0.2274	0.2481	0.1632	0.1650	0.0000						
<i>L. curtithorax</i>	0.2507	0.1576	0.1629	0.1740	0.1858	0.1720	0.1751	0.1963	0.1803	0.1792	0.2069	0.2113	0.2119	0.2197	0.0000					
<i>N. cruciata</i>	0.2800	0.1838	0.1883	0.1509	0.1589	0.1629	0.1520	0.1612	0.1513	0.1626	0.2222	0.2352	0.2336	0.2462	0.1825	0.0000				
<i>Pt.maipo</i>	0.2641	0.1701	0.1772	0.1849	0.2006	0.1938	0.1857	0.2039	0.1941	0.1872	0.2098	0.1984	0.1949	0.2022	0.1780	0.1974	0.0000			
<i>Pyg.qingyu</i>	0.2151	0.1258	0.1333	0.1638	0.1804	0.1685	0.1642	0.1832	0.1678	0.1665	0.1947	0.2030	0.2001	0.2096	0.1484	0.1757	0.1682	0.0000		
<i>Pyr.rufa</i>	0.3839	0.2981	0.2984	0.3137	0.3248	0.3147	0.3136	0.3253	0.3147	0.3173	0.3138	0.3130	0.3142	0.3217	0.2980	0.3193	0.2984	0.2883	0.0000	
<i>S. substriata</i>	0.2659	0.1733	0.1754	0.1827	0.1898	0.1861	0.1827	0.1989	0.1895	0.1876	0.2144	0.2202	0.2163	0.2259	0.1751	0.1929	0.1855	0.1649	0.3097	0.0000

P-distances mentioned in main text are marked in different colours. Red in yellow shade shows genetic distance between *Aq. leii* and *Aq.ficta*; Blue in yellow shade shows genetic distance between *Aq.lateralis* Chinese and *Aq.lateralis* Japanese; green shows genetic distance between *Aq. xianning* and other firefly species; brown shows genetic distance between *Aq. qingshen* and other firefly species.