

The morphology, genetic structure, and haplotype distribution of the invasive freshwater snails *Biomphalaria straminea* and *Physa acuta* in Guangdong, China

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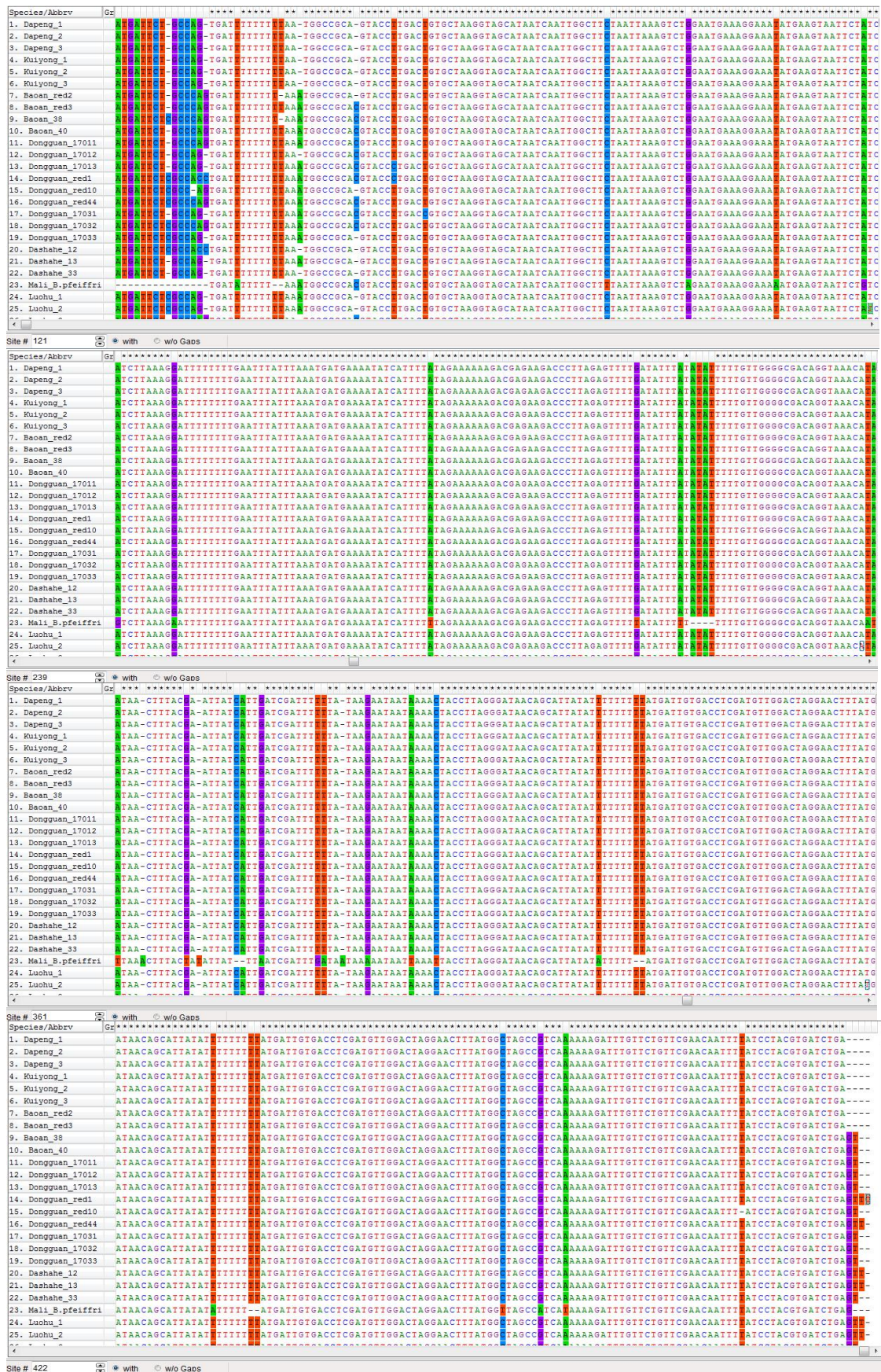


Fig. S1 Partial results of multiple alignments of 16S rRNA gene of *Biomphalaria* snails in Guangdong. * Represented the conserved region.

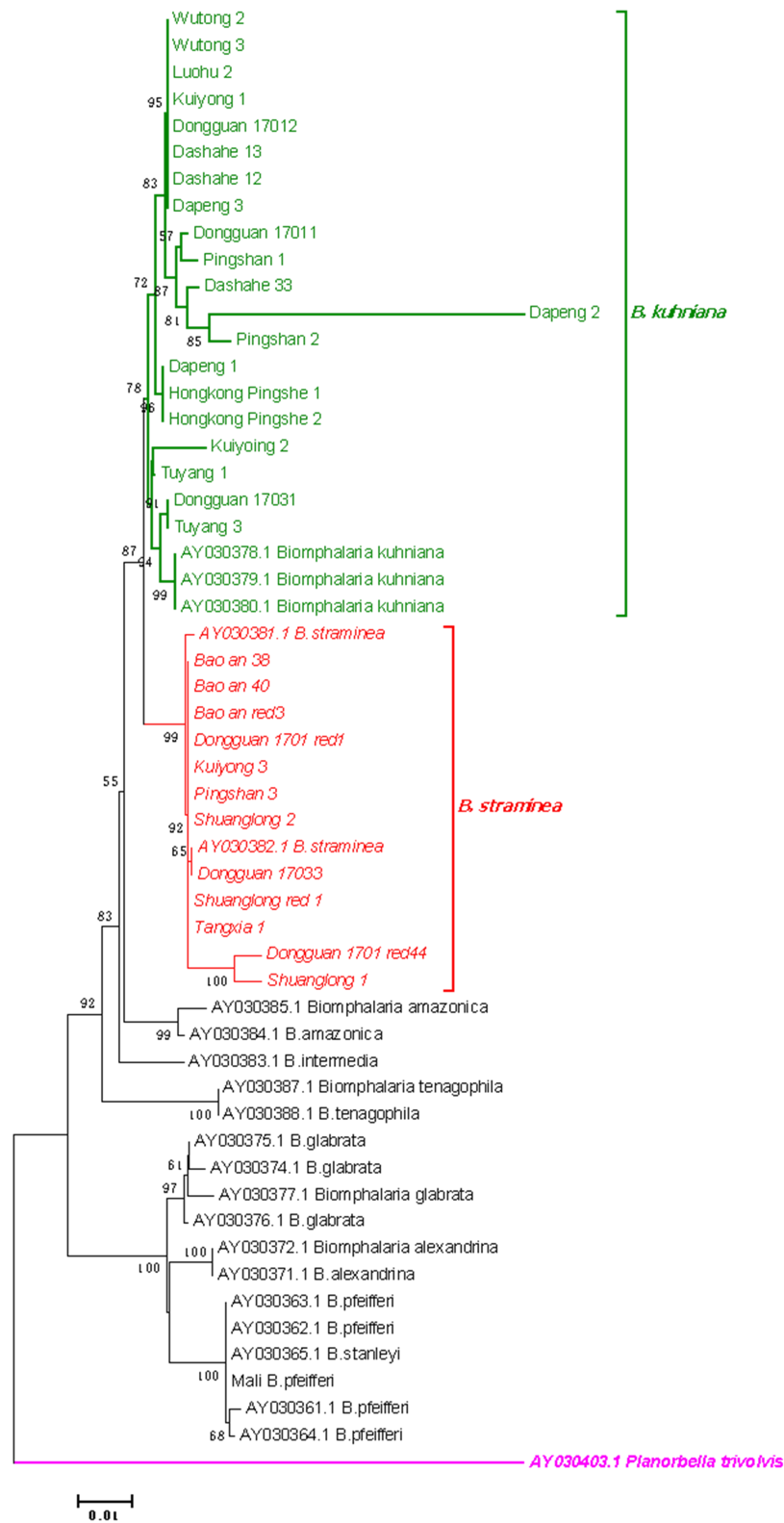


Fig. S2 Phylogenetic tree of ITS of *Biomphalaria* snails in Guangdong by Neighbor-Joining method

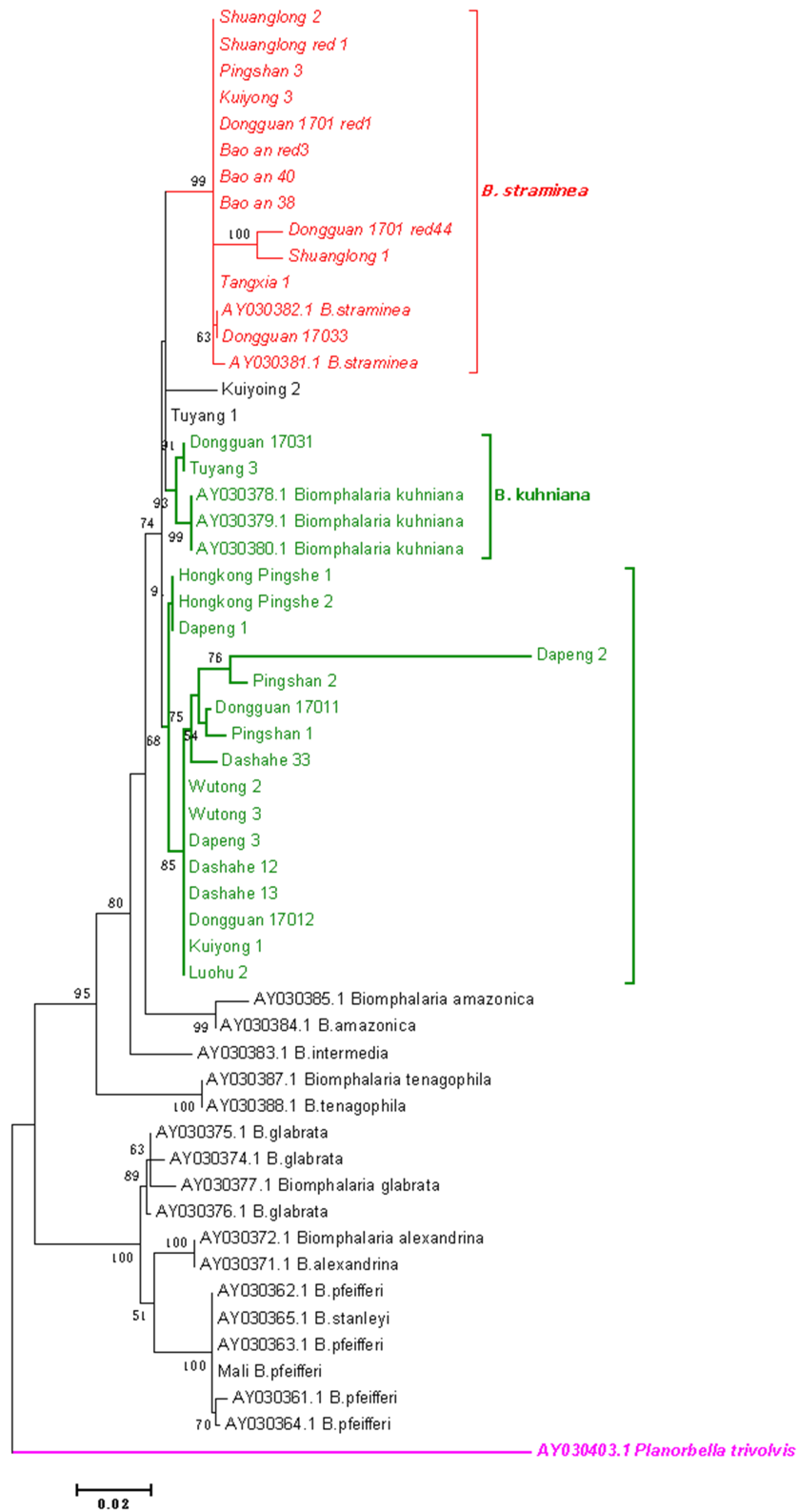


Fig. S3 Phylogenetic tree of ITS of *Biomphalaria* snails in Guangdong by Maximum likelihood method.



Fig. S4 Multiple alignments of 16S rRNA gene of *Physa acuta* in Guangdong. * Represented the conserved region.

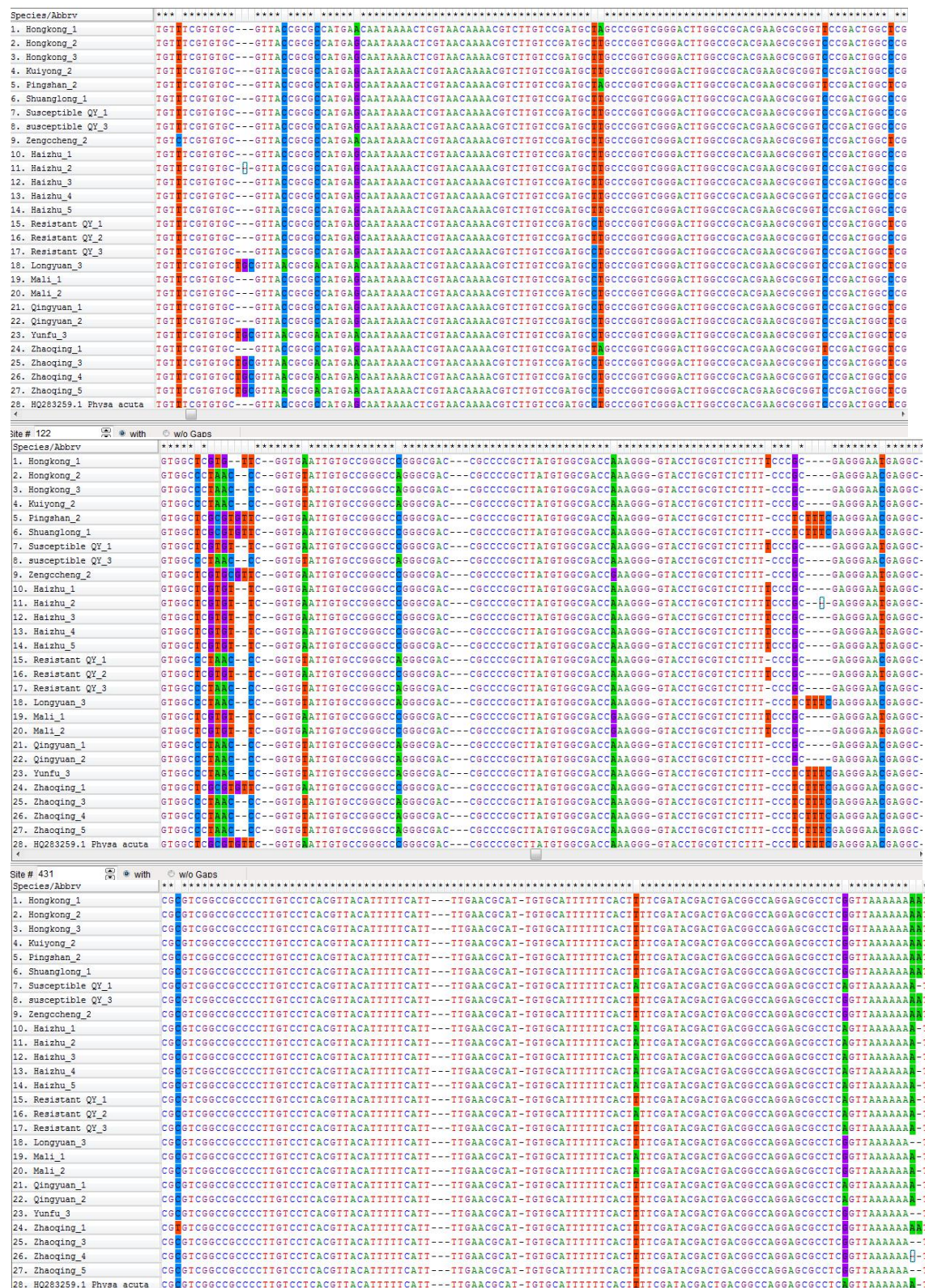


Fig. S5 Multiple alignments of ITS gene of *Physo acuta* in Guangdong. * Represented the conserved region.

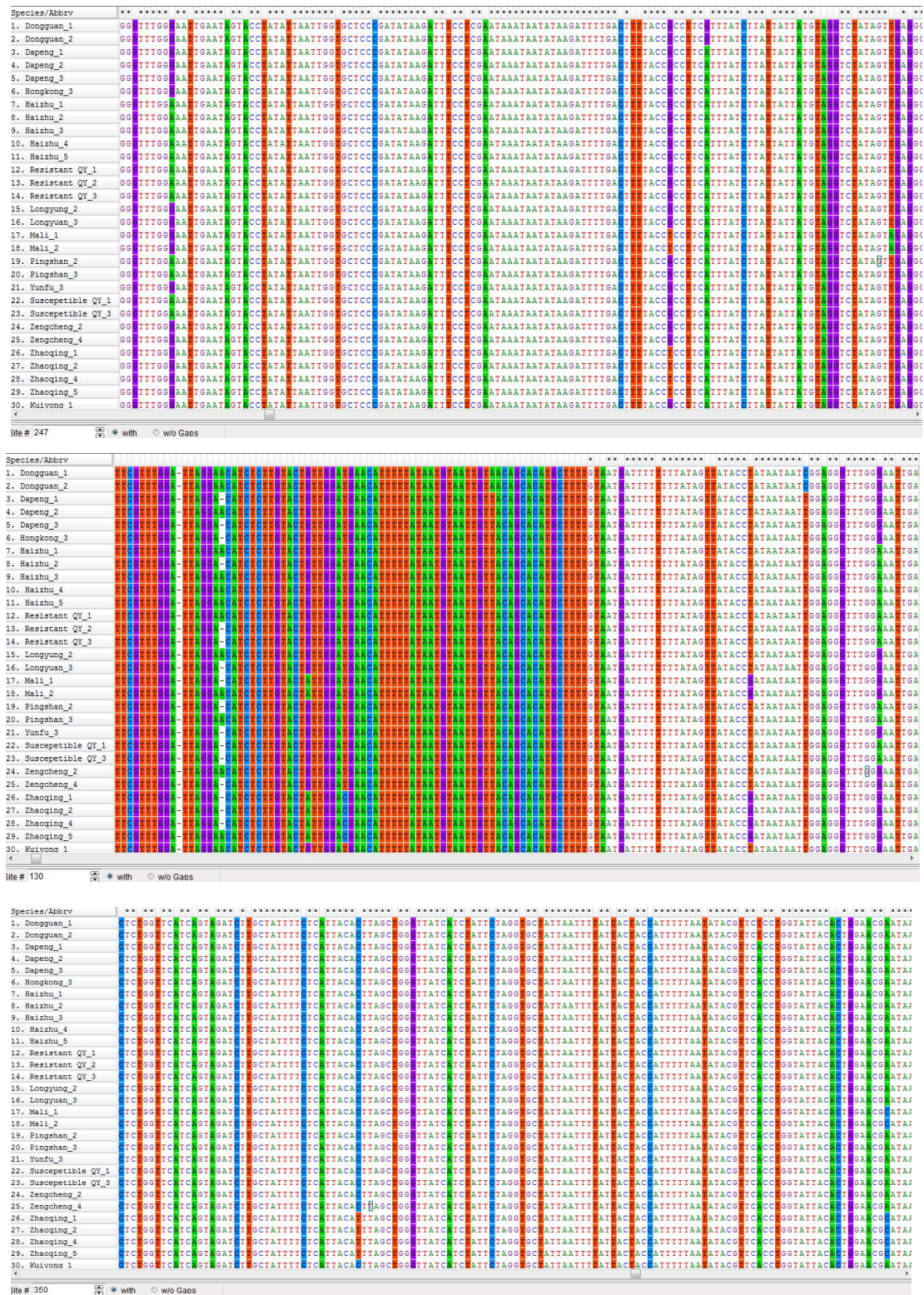


Fig. S6 Multiple alignments of *COI* gene of *Physa acuta* in Guangdong. * Represented the conserved region.

Table S1 PCR primers for *Biomphalaria* snail

Gene	Forward frimer	Reverse primer	Reference
<i>COI</i>	LCO1490:GGTCAACAAATCA TAAAGATATTGG	HC02198:TAAACTTCAGGG TGACCAAAAAATCA	[9]
ITS	ETTS1:TGCTTAAGTTCAGCG GGT	ETTS2:TAACAAGGTTTCCG TAGGTGAA	[20]
16S rRNA	16Sar:CGCCTGTTTATCAAAA ACAT	16Sbr:CCGGTCTGAACTCA GATCACGT	[9]

Table S2 PCR primers for *Physa acuta*

Gene	Forward frimer	Reverse primer	Reference
<i>COI</i>	TTGGGATCTGGTGTGGATT G	CCTCTTGGGTCATAGAACC T	FJ373016.1
ITS	GTGACGGCCTCGGATTGGT C	TTGGCTGCGGTTCTTCATC G	HQ283259.1
16S rRNA	CGCCTGTTTATCAAAAACA T	CCGGTCTGAACTCAGATCA CGT	[9]
18S rRNA	TAAGTTCACACTGTCCCAT GG	AGTCCCGTATTGTTATTTTT CG	L78905.1
28S rRNA	ACGTCTGCGTCGCCTTGTG G	GAGCGGCTACCTTTGGCAC C	DQ256738.1

Table S3 PCR reaction condition for primers of *Biomphalaria* snails

Reaction process	Temperature	Time
pre-denaturation	95°C	5 min
denaturation	95°C	35 sec
annealing	53.9°C	35 sec
extension	72°C	30 sec
cycles	35	
extension	72°C	10min

Table S4 PCR reaction condition for 18S rRNA、28S rRNA and ITS primers of *Physa acuta*

Reaction process	Temperature	Time
pre-denaturation	95°C	5 min
denaturation	95°C	50 sec
annealing	55°C	35 sec
extension	72°C	50 sec
cycles	35	
extension	72°C	10 min

Table S5 PCR reaction condition for 16S rRNA and *COI* primers of *Physa acuta*

Reaction process	Temperature	Time
pre-denaturation	94°C	4 min
denaturation	94°C	30 sec
annealing	51°C	30 sec
extension	72°C	45 sec
cycles	35	
extension	72°C	10 min