

1 Comparison of gut microbiome in the Chinese mud 2 snail (*Cipangopaludina chinensis*) and the invasive 3 golden apple snail (*Pomacea canaliculata*)

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20 Abstract

21 **Background.** Gut microbiota play a critical role in nutrition absorption and environmental
22 adaptation and can affect the biological characteristics of host animals. The invasive golden
23 apple snail (*Pomacea canaliculata*) and native Chinese mud snail (*Cipangopaludina chinensis*)
24 are two sympatric freshwater snails with similar ecological niche in southern China. However,
25 gut microbiota comparison of interspecies remains unclear. Comparing the difference of gut
26 microbiota between the invasive snail *P. canaliculata* and native snail *C. chinensis* could
27 provide new insight into the invasion mechanism of *P. canaliculata* at the microbial level.

28 **Methods.** Gut samples from 20 golden apple snails and 20 Chinese mud snails from wild
29 freshwater habitats were collected and isolated. The 16S rRNA gene V3-V4 region of the gut
30 microbiota was analyzed using high throughput Illumina sequencing.

31 **Results.** The gut microbiota dominantly composed of Proteobacteria, Bacteroidetes,
32 Firmicutes and Epsilonbacteraeota at phylum level in golden apple snail. Only Proteobacteria
33 was the dominant phylum in Chinese mud snail. Alpha diversity analysis (Shannon and
34 Simpson indices) showed there were no significant differences in gut microbial diversity, but
35 relative abundances of the two groups differed significantly ($P < 0.05$). Beta diversity analysis
36 (Bray Curtis and weighted UniFrac distance) showed marked differences in the gut

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63 microbiota structure ($P < 0.05$). Unique or high abundance microbial taxa were more
64 abundant in the invasive snail compared to the native form. Functional prediction analysis
65 indicated that the relative abundances of functions differed significantly regarding cofactor
66 prosthetic group electron carrier and vitamin biosynthesis, amino acid biosynthesis, and
67 nucleoside and nucleotide biosynthesis ($P < 0.05$). These results suggest an enhanced
68 potential to adapt to new habitats in the invasive snail.

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70 **Keywords:** *Pomacea canaliculata*, *Cipangopaludina chinensis*, Invasive species, Gut
71 microbiota, 16S rRNA gene, High-throughput sequencing, Snail

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72 Introduction

73 In recent years, gut microbiota research has made considerable progress (Gallo et al., 2020b),
74 highlighting the crucial involvement of gut microbes in many mammalian biological
75 processes, such as nutrition absorption, behavior, and intestinal development (Chen et al.,
76 2021b; Li et al., 2019; Lize et al., 2013). Continuous interactions between the gut microbiota
77 and host have evolved into a dynamic microbial ecological complex (Brestoff and Artis,
78 2013). Unlike in terrestrial vertebrates, gut microbiota in aquatic animals are more variable
79 (Ringo et al., 2016) and sensitive to changing conditions (Zhang et al., 2020).

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80 The association between hosts and gut microbiota can contribute to our understanding of
81 longevity, metabolism, development, and physiology of invertebrates (Lee and Hase, 2014).
82 In shrimp, gut microbiota have been suggested to affect visible nutrient acquisition and
83 disease incidence, which is a major contributor to population restriction (Xiong, 2018).
84 Similarly, gut microbiota in other aquatic invertebrates, such as *Daphnia*, play an important
85 role in improvement of high temperature resistance and antiviral ability (Akbar et al., 2021).
86 Cellulolytic bacteria in the giant African snail (*Achatina fulica*) gut play an important role in
87 cellulose decomposition (Pinheiro et al., 2015). The gut microbiota is important for organisms
88 to adapt to new environments as well. Previous studies have shown that gut microbiota in
89 invasive species have greater potential to invade the new habitats (Gallo et al., 2020a; Qu et
90 al., 2020). For instance, the snail *Potamopyrgus antipodarum* have greater core microbial taxa
91 as an invasive species (Bankers et al., 2021). Therefore, comparing the diversity and structure
92 of the gut microbiota between sympatric invasive and native freshwater species may help
93 clarify the underlying mechanisms related to invasion.

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94 Various studies have shown that the gut microbiota can effectively resist internal
95 pathogen invasion and can promote successful biological invasion into new environments
96 (Becker et al., 2021; Habineza et al., 2019; Zhang et al., 2018). The golden apple snail
97 (*Pomacea canaliculata*) is listed among the 100 worst invasive alien species worldwide by
98 the International Union for Conservation of Nature and the Invasive Species Specialist Group
99 (Chen et al., 2011a). This snail causes serious damage to aquatic crops, as well as to wetland
100 floral diversity and ecosystem functioning (Carlsson et al., 2004; Lowe et al., 2000). The

118 Chinese mud snail (*Cipangopaludina chinensis*) is a native species and popular aquatic food
119 source in China. Chinese mud snail feeds mainly on plant debris, whereas the golden apple
120 snail has a voracious appetite for vegetation, including rice (*Oryza sativa*) crops (She et al.,
121 2013). Both snail species occupy similar freshwater habitats, but with different feeding habits
122 in the wild. Whether the differences in feeding habits are closely related to gut microbiota
123 remains unclear. Gut microbiota are closely related to host growth performance (Fan et al.,
124 2019). It has been shown that the gut microbiota of golden apple snails can be impacted by
125 developmental stage, gender, and gut part (Li et al., 2019; Lyra et al., 2018). However, few
126 studies have explored the differences and abundance of gut microbiota in the two sympatric
127 invasive and native freshwater snails. Additionally, we speculated that the gut microbiota may
128 be important for the invasion and adaptation of invasive snails such as the apple snail *P.*
129 *canaliculata* to new environments. Therefore, to better understand the gut microbiota
130 community in the two freshwater snails, and investigate the invasive mechanism of golden
131 apple snail at microbial level, we compared the differences in gut microbiota between the
132 invasive golden apple snail and native Chinese mud snail using 16S rRNA sequencing on the
133 Illumina MiSeq platform. This study is of importance for the understanding of invasion
134 mechanism of *P. canaliculata*.

135 Materials and Methods

136 Sample collection and treatment

137 A total of 20 Chinese mud snails and 20 golden apple snails were collected from the Xiangsi
138 River (25.0459 °N, 110.1128 °E) in Huixian village, Guilin city, Guangxi, China in June 2021.
139 This research was approved by the ethics committee of Guangxi Normal University
140 (IACUC-202111-003). All snails were collected from shallow water, and sampled by fishing
141 net. The average shell heights of *P. canaliculata* and *C. chinensis* were 3.8 ± 0.3 cm and $5.3 \pm$
142 0.3 cm, respectively. The *P. canaliculata* (PC group) and *C. chinensis* (CC group) snails were
143 maintained in 1 L of ultra-pure water in a 25 °C room for 5–7 days. All snails were fed with
144 Chinese cabbage (*Brassica rapa*). Prior to dissection, the snails were starved for 24 h to
145 minimize the amount of partially digested food in the gut.

146 The shells of snails were cleaned with 70% ethanol two times and ultra-pure water three
147 times. Shell destruction, dissection, and gut extraction were performed on a clean bench. Due
148 to the small size of snail guts, five snail's guts were pooled as a single sample, to make sure
149 the sample adequacy and experiment accuracy was qualified. All samples were repeated four
150 times. A total of eight samples were named with PC-1, PC-2, PC-3, PC-4 and CC-1, CC-2,
151 CC-3, CC-4, respectively. Samples were stored in 5-ml aseptic centrifuge tubes at -80 °C
152 before DNA extraction.

153 16S rRNA gene sequencing

154 The gut microbial DNA was extracted using a Fast DNA SPIN Extraction Kit (MP
155 Biomedicals, USA) following the manufacturer's instructions. The isolated DNA was stored

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176 at -80 °C until polymerase chain reaction (PCR). The DNA concentration and molecular size
177 were measured using UV spectrophotometry (Eppendorf, BioPhotometer, Germany) and 0.8%
178 agarose gel electrophoresis, respectively. The hypervariable V3-V4 region of the 16S rRNA
179 gene was amplified by PCR using universal bacterial primers (338F:
180 5'-ACTCCTACGGGAGGGAGCA-3', 806R: 5'-GGACTACHVGGGTWTCTAAT-3'). Each
181 primer included barcode sequences to promote the sequencing of products. The DNA (20 ng)
182 of each sample was amplified in 25-µl reactions consisting of 0.25 µl of Q5 high-fidelity DNA
183 polymerase (NEB, Ipswich, UK), 5 µl of 5-fold reaction buffer, 5 µl of 5-fold high GC buffer,
184 0.5 µl of dNTP Mix (10 mM), 2 µl of template DNA, 1 µl of each primer (10 mM), and 10.25
185 µl of ddH₂O. The PCR conditions were as follows: an initial denaturation at 98 °C for 5 min,
186 25 cycles of 98 °C denaturation for 10 s, 50 °C annealing for 30 s, 72 °C extension for 30 s,
187 and a final extension at 72 °C for 5 min. The PCR products were detected by 2% agarose gel
188 electrophoresis and purified with an AxyPrep DNA Gel Extraction Kit (Axygen, New York,
189 USA). Quantification of PCR products was performed using a Quant-iT PicoGreen dsDNA
190 Assay Kit (Invitrogen, USA). A TruSeq Nano DNA LT Library Prep Kit (Illumina, USA) was
191 used to establish the DNA library. The library was sequenced using a MiSeq Reagent Kit v3
192 (6 000-cycles-PE) (Illumina, USA) on the MiSeq platform by Personal Biotechnology Co.,
193 Ltd. (Shanghai, China).

194 Data and analysis

195 The DADA2 method was used for quality control (Callahan et al., 2016). QIIME2 (version:
196 2019.4) software was used to remove primer sequences, sequences shorter than 150 bp, and
197 chimera sequences. The obtained high-quality sequences were clustered into operational
198 taxonomic units (OTUs) at 97% identity using VSEARCH software (v2.13.4) (Torbjørn et al.,
199 2016). The OTUs were annotated using the 16S rRNA database tool (SILVA v132) in QIIME2
200 (version: 2019.4). The lowest sequence number of OTU abundance was standardized for
201 further study. Raw sequencing reads were submitted to the National Center for Biotechnology
202 Information (NCBI) BioProject database (PRJNA756881).

203 Alpha and beta diversity estimation

204 The alpha and beta diversity indices represent the diversity of species within and between
205 biotopes, respectively (Whittaker, 1972). QIIME2 (version: 2019.4) was used to calculate the
206 alpha indexes including community richness (Chao1 and Observed species), diversity
207 (Shannon and Simpson), evolutionary population diversity (Faith's PD), evenness (Pielou's
208 evenness). The calculation methods can be obtained at
209 <http://scikit-bio.org/docs/latest/generated/skbio.diversity.alpha.html#module-skbio.diversity.alpha>
210 [pha](#). We used R software to sketch box plots of estimators with an intuitive form. Significance
211 between groups was tested using the Wilcoxon rank-sum and Dunn tests.

212 To estimate beta diversity and similarity, differences in relative abundance of OTUs
213 between two groups were detected using the nonmetric multidimensional scaling (NMDS).
214 Analysis of similarities (ANOSIM) based on Bray-Curtis distance and weighted UniFrac

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226 distance with 999 permutations was used to determine similarities between two groups.
227 Differences in bacterial abundances (from phylum to family) between the two species were
228 tested using linear discriminant analysis effect size (LEfSe).

229 **Functional prediction and statistical analysis of gut microbiota**

230 Phylogenetic Investigation of Communities by Reconstruction of Unobserved States 2
231 (PICRUSt2) software (<https://github.com/picrust/picrust2/wiki>) was used to predict
232 community functions of the gut microbiota (Douglas et al., 2020). Greengenes ID
233 corresponding to each OTU was searched in the Kyoto Encyclopedia of Genes and Genomes
234 (KEGG) database and was classified to the relevant KEGG pathway. Numbers of functional
235 genes in each pathway were calculated to compare functional enrichment in gut microbiota
236 between the two groups. Statistical analyses were conducted using independent-samples *t*-test
237 in SPSS (v19.0) at a significance level of $P = 0.05$.

239 **Results**

240 **Gut microbial diversity and composition in *P. canaliculata* and *C. chinensis*,**

241 A total of 737 690 high-quality sequences were obtained from all eight snail DNA samples
242 (PC 1-4, and CC 1-4) after quality control and filtration, including 391 551 reads from the PC
243 group and 346 139 reads from the CC group (ranging from 46 498–187 205 reads per sample).
244 We re-sampled all samples based on the smallest number of reads (46 498) to correct for
245 differences in read number. **The rarefaction curve of species based on the Shannon index**
246 **reached asymptote**, indicating that sequencing depth basically covered all species in the
247 samples (Figure S1).

248 Filtered sequences were clustered into OTUs at a 97% identity, and we obtained 5 911
249 valid OTUs after removing those with relative abundances < 0.001%, including 4 927 of *P.*
250 *canaliculata* and 1 080 of *C. chinensis*. Comparing these OTUs with the SILVA database,
251 6 007 OTUs were annotated to 29 phyla, 52 classes, 123 orders, 247 families, 575 genera, and
252 963 species. For the PC group, the 4 927 OTUs were annotated to 27 phyla, 49 classes, 111
253 orders, 239 families, 553 genera, and 894 species. For the CC group, the 1 080 OTUs were
254 annotated to 12 phyla, 18 classes, 44 orders, 67 families, 115 genera, and 150 species (Figure
255 S2). In addition, the Venn diagram indicated that 96 OTUs existed in both groups. Compared
256 to the CC group (984), however, the number of specific OTUs was much higher in the PC
257 group (4 831) (Figure S3).

258 Based on alpha diversity analysis, the Shannon and Simpson indices indicated that gut
259 microbiota diversity did not differ significantly between the two groups. However, the Chao1
260 and Observed species indices indicated that gut microbiota abundance was significantly
261 higher in the PC group than in the CC group ($P < 0.05$) (Figure 1).

262 Differences in beta diversity were evaluated using NMDS analysis based on Bray-Curtis
263 and weighted UniFrac distances. Results showed that the PC and CC groups could be isolated

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and *C. chinensis* gut microbiota...

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270 from each other, and intergroup distance was higher than intragroup distance based on both
271 calculation methods (Figure 2A, B). Moreover, ANOSIM revealed significant differences
272 between the PC and CC groups (Bray-Curtis $R = 0.396$, $P = 0.027$, NMDS stress = 0.0000982;
273 weighted UniFrac $R = 1$, $P = 0.03$, NMDS stress = 0.0000776), as shown in Figure 2C, D.
274 Similar results were observed from principal coordinate analysis (PCoA) based on
275 Bray-Curtis and weighted UniFrac distances (Figure S4).

276 277 **Taxonomic composition of gut microbiome in *P. canaliculata* and *C. chinensis***

278 From all eight samples, the top 10 gut microbiota phyla were shown in Figure 3 and Table S1.
279 Comparing bacterial composition between the PC and CC groups, microbes with a relative
280 abundance >2% were defined as dominant phyla. Results showed that Proteobacteria was the
281 dominant phylum in both groups, accounting for $53.78\% \pm 15.59\%$ in the PC group and 98.94%
282 $\pm 0.20\%$ in the CC group. In the PC group, three other phyla were found with a relative
283 abundance >2%, including Bacteroidetes ($23.19\% \pm 11.38\%$), Firmicutes ($16.00\% \pm 6.91\%$),
284 and Epsilonbacteraeota ($4.28\% \pm 2.53\%$). For the CC group, Proteobacteria was the only
285 phylum with a relative abundance >2%. Of the top 10 phyla, only seven existed in the CC
286 group, with Spirochaetes, Tenericutes, and Fibrobacteres not detected.

287 At the genus level, the top 10 genera were shown in Figure 4 and Table S2. In the PC
288 group, the dominant genus was *Chryseobacterium* ($14.62\% \pm 13.24\%$), followed by
289 *Lactococcus* ($9.78\% \pm 8.18\%$), *Uliginosibacterium* ($9.73\% \pm 6.16\%$), *Aquitalea* ($6.13\% \pm$
290 3.13%), *Novispirillum* ($4.11\% \pm 2.39\%$), *Sulfurospirillum* ($3.50\% \pm 2.24\%$), *Dechloromonas*
291 ($2.46\% \pm 2.03\%$), and *Bacteroides* ($2.17\% \pm 1.95\%$) (Figure 4 and Table S2). In the CC group,
292 the dominant genera were *Enterobacter* ($6.73\% \pm 2.31\%$) and *Hafnia-Obesumbacterium* (2.49%
293 $\pm 2.18\%$). Only four of the top 10 genera were found in the CC group, with *Chryseobacterium*,
294 *Uliginosibacterium*, *Aquitalea*, *Novispirillum*, *Sulfurospirillum* and *Dechloromonas* not
295 detected. In addition, based on LEfSe analysis ($LDA > 2$), 10 phyla and 87 genera were
296 identified showing significant differences (Figure S5).

297 298 **Functional prediction of gut microbiota**

299 Gut microbiota functions were predicted using PICRUST2. From the KEGG database, a total
300 of 7186 genes were classified into seven level-1 pathways and 60 level-2 pathways. Of these
301 60 pathways, 17 were involved in generation of precursor metabolite energy, 15 were
302 involved in degradation/utilization/assimilation, 12 were involved in biosynthesis, 10 were
303 involved in metabolic clusters, two were involved in macromolecule modification, two were
304 involved in glycan pathways, and two were involved in detoxification (Figure 5). From the
305 level-2 results, cofactor, prosthetic group, electron carrier, and vitamin biosynthesis (16.28%
306 $\pm 0.38\%$), amino acid biosynthesis ($13.42\% \pm 0.11\%$), fatty acid and lipid biosynthesis (9.43%
307 $\pm 0.60\%$), and nucleoside and nucleotide biosynthesis ($11.53\% \pm 0.16\%$) were the most
308 abundant functions (Figure 5). Among the top abundant functions, cofactor prosthetic group

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Differences in beta diversity were evaluated using NMDS analysis based on Bray-Curtis and weighted UniFrac distances. Results showed that the two groups could be isolated from each other, and intergroup distance was higher than intragroup distance based on both calculation methods (Figure 4A, B). Moreover, ANOSIM revealed significant differences between the PC and CC groups (Bray-Curtis $R = 0.396$, $P = 0.027$, NMDS stress = 0.0000982; weighted UniFrac $R = 1$, $P = 0.03$, NMDS stress = 0.0000776), as shown in Figure 4C, D. Similar results were observed from principal coordinate analysis (PCoA) based on Bray-C...

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387 electron carrier and vitamin biosynthesis ($t = -2.861, P = 0.029$), amino acid biosynthesis ($t =$
388 $17.057, P < 0.01$), nucleoside and nucleotide biosynthesis ($t = 10.457, P < 0.01$), fatty acid
389 and lipid biosynthesis ($t = 2.887, P = 0.028$), carboxylate degradation ($t = -13.277, P < 0.01$),
390 secondary metabolite degradation ($t = -10.064, P < 0.01$), carbohydrate degradation ($t =$
391 $-12.963, P < 0.01$), nucleoside and nucleotide degradation ($t = 2.533, P = 0.044$), aromatic
392 compound degradation ($t = -3.500, P = 0.013$), glycolysis ($t = 3.540, P = 0.012$), amino acid
393 degradation ($t = -3.725, P = 0.010$), C1 compound utilization and assimilation ($t = 4.288, P =$
394 0.005), and aromatic compound biosynthesis ($t = 22.984, P < 0.01$) were significantly
395 different between the PC and CC group (Figure S6).

396 Discussion

397 The composition and diversity of gut microbiota can be affected by a variety of factors, such
398 as the environment, food sources and species (Bibbo et al., 2016; Jin et al., 2017). Previous
399 study on the gut microbiota of freshwater *Radix auricularia* and *Planorbella trivolvis* snails
400 found that Proteobacteria is dominant in both, but microbial diversity differs significantly,
401 which may be due to disparate sampling sites (Hu et al., 2018). In contrast, a six-month study
402 found no significant differences in alpha diversity between invasive red-eared slider turtles
403 (*Trachemys scripta elegans*) and native Chinese three-keeled pond turtles (*Chinemys reevesii*)
404 (Qu et al., 2020). In addition, environment plays an important role to the gut microbiota of the
405 same invasive species as well. It was reported that there were significant differences in the gut
406 microbial community structure of the invasive fish *Oreochromis mossambicus* from the
407 different habitats (Gaikwad et al., 2017). A recent study also showed that the core microbial
408 taxa of invasive freshwater snail *P. antipodarum* in invaded habitat were larger than that in
409 origin habitat (Bankers et al., 2021). These studies suggest that the growth environment is a
410 vital factor for gut microbial diversity. In the current study, we found no significant
411 differences in gut microbiota diversity between the two freshwater snails, which were likely
412 due to their similar habitats. However, the Chao1 and Observed species indices showed
413 marked differences in gut microbiota abundance between the two groups, with significantly
414 higher abundance in the PC group than in the CC group. Previous research has found that
415 dietary changes are not significantly correlated with alpha diversity but are positively
416 correlated with beta diversity (Li et al., 2016). The beta diversity in this study was
417 significantly different between golden apple snails and Chinese mud snails. Golden apple
418 snails have a more extensive diet than Chinese mud snails (Morrison and Hay, 2011), which
419 may be a dominant factor related to the significant differences in beta diversity between the
420 two species. Furthermore, the gut microbiota structure was more complex in the PC group
421 than in the CC group. It was suggested that more complex microbial structure may be able to
422 support the golden apple snail to adapt to the new habitats more rapidly and flexibly.

423 In this study, the top three phyla in the two groups were Proteobacteria, Bacteroidetes,
424 and Firmicutes, followed by Epsilonbacteracota, Spirochaetes, and Acidobacteria. Comparing

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455 our results with other studies, we found that dominant microbiota were quite similar at the
456 phylum level (Chen et al., 2021a; Li et al., 2019). We compared results from two relevant
457 studies and found five phyla (Proteobacteria, Bacteroidetes, Tenericutes, Actinobacteria, and
458 Firmicutes) in common (Chen et al., 2021a; Li et al., 2019). However, Epsilonbacteraeota and
459 Acidobacteria were only found in our study (Chen et al., 2021a; Li et al., 2019).
460 Epsilonbacteraeota is widely known for clinical relevance and chemolithotrophy and is
461 usually found in sulfide-rich sediments (Waite et al., 2017). Acidobacteria is one of the most
462 abundant soil bacteria with a unique ecological function and is found in a wide variety of
463 environments, including under extreme and polluted conditions (Liu et al., 2017; Navarrete et
464 al., 2015). Epsilonbacteraeota and Acidobacteria were only found in our study, which may be
465 due to environmental differences or differences in long-term food sources of the golden apple
466 snails. Further relevant environmental experiments are needed to screen for factors that may
467 contribute to this phenomenon. Moreover, based on other studies on freshwater snails (e.g.,
468 *Radix auricularia*, *Planorbella trivolvis*, and *Bulinus africanus*), the compositions of
469 dominant gut microbiota are very similar at the phylum level (Hu et al., 2018; Hu et al., 2021;
470 Van Horn et al., 2012). Although intestinal microbiota diversity is found in disparate snails,
471 there appear to be core microbes shared among the above-mentioned snails.

472 Proteobacteria was the dominant microbiota in both groups, and primary microbiota in
473 other Gastropoda like *Potamopyrgus antipodarum* and *Achatina fulica* (Cardoso et al., 2012b;
474 Takacs-Vesbach et al., 2016). Moreover, Proteobacteria is related to environmental adaptation
475 due to its ability to secrete lipase, protease, and amylase (Pemberton et al., 1997). Our results
476 also showed that the Proteobacteria genus *Enterobacter* was dominant at the genus level.
477 *Enterobacter* is considered a cellulolytic genus (Chen et al., 2021a; Pawar et al., 2015), with
478 certain members, such as the *Enterobacter* sp. strain Bisph2, able to degrade glyphosate (an
479 organic phosphine herbicide) (Benslama and Boulahrouf, 2016), and others, such as
480 *Enterobacter* spH1, able to degrade glucose and glycerin into value-added products (Gueell et
481 al., 2015). Chinese mud snails live in paddy fields, lakes, and rivers (Nakanishi et al., 2014)
482 and primarily feed on diatoms and plant debris (Cui et al., 2012), with no reports of
483 carnivorous behavior has been reported yet. Proteobacteria can help in diatom and plant
484 debris digestion. Therefore, we speculate that the relatively simple “lifestyle” of Chinese mud
485 snails does not require a complex gut microbiota composition.

486 In contrast, the diets of golden apple snails are more complex and include plants and
487 aquatic invertebrates, such as *Biomphalaria peregina*, *Biomphalaria straminea*, and *Physa*
488 *acuta* (Cazzaniga, 1990; Kwong et al., 2009). More complicated diets require more
489 digestion-related bacteria. In addition to digestion-related Proteobacteria, both Bacteroidetes
490 and Firmicutes were related to nutrient absorption (Sommer et al., 2016; Thomas et al., 2011).
491 Bacteroidetes can degrade high molecular weight organic matter, while Firmicutes was related
492 to the degradation of lipids and dietary fiber (Chen et al., 2011b; Evans et al., 2011). Both
493 these were highly abundant in golden apple snails, indicating that they had more effective

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500 material decomposition and energy absorption than the Chinese mud snail. The functions of
501 these two phyla have also been explored in invertebrates (Wang et al., 2020b). In the current
502 study, average Bacteroidetes and Firmicutes abundances were significantly higher in the PC
503 group (23.20% and 16.00%, respectively) than in the CC group (0.34% and 0.49%,
504 respectively). The *Chryseobacterium* genus was only found in the PC group, and the relative
505 abundance of *Lactococcus* was significantly higher in the PC group than in the CC group.
506 *Chryseobacterium* can decompose lignocellulose (Carlos et al., 2018; Puentes-Tellez and
507 Salles, 2018; Weiss et al., 2021). In addition, study on the American cockroach (*Periplaneta*
508 *americana*) reported that *Chryseobacterium* is only found in a high-fiber diet, indicating that
509 *Chryseobacterium* can decompose fiber (Dugas et al., 2001). As gram-positive bacteria,
510 *Lactococcus* species are recognized as safe microorganisms for food production and can
511 produce L-lactic acid through acidification to provide energy (Casalta and Montel, 2008).
512 Unique or high abundance microbial taxa were related to the material decomposition and
513 capacity utilization, which indicated that the golden apple snail can digest more substances to
514 be more successful at invasion. Therefore, the higher relative abundance and complex
515 composition of gut microbiota in *P. canaliculata* can be one of the reasons for its high
516 survival and adaptability, and thus its successful invasion.

517 Among the top 10 dominant phyla, three existed in the PC group only: i.e., Spirochaetes,
518 Fibrobacteres, and Tenericutes. In recent years, less attention has been paid to the function of
519 spirochetes, with most studies limited to pathogens involved in Lyme disease, recurrent fever,
520 and syphilis (Gattorno et al., 2019; Hook, 2017; Radolf et al., 2012). In the current study, we
521 speculate that the Spirochaetes bacteria are parasites rather than functional bacteria in the
522 golden apple snails. Fibrobacteres is a well-known primary degrader of cellulose in the
523 intestinal tract of herbivores and can hydrolyze polymer using a distinctive set of glycoside
524 hydrolases and binding domains (Rahman et al., 2016). Tenericutes is suggested to be
525 involved in carbohydrate storage, carbon fixation, and environmental response (Wang et al.,
526 2020a). In this study, both Fibrobacteres and Tenericutes were unique dominant microbiota in
527 golden apple snail, which may be related to their high invasiveness.

528 Functional KEGG predictions indicated that many functions were significantly different
529 between the PC and CC groups, including cofactor, prosthetic group, electron carrier, vitamin
530 biosynthesis, amino acid biosynthesis, nucleoside and nucleotide biosynthesis, fatty acid and
531 lipid biosynthesis, and carboxylate degradation, consistent with previous studies on
532 indigenous species *Helix pomatia* and invasive species *Achatina fulica* (Cardoso et al., 2012a;
533 Nicolai et al., 2015). Of these functions, the relative abundance in the PC group was
534 significantly higher than that in the CC group, including amino acid biosynthesis, fatty acid
535 and lipid biosynthesis, aromatic compound biosynthesis, and C1 compound utilization and
536 assimilation. Gut microbiota are crucial to host amino acid homeostasis and health
537 (Mardinoglu et al., 2015). Several genera are known to play crucial roles in amino acid
538 biosynthesis, including *Fusobacterium*, *Bacteroides*, and *Veillonella* (Lin et al., 2017).

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574 Additionally, *Lactococcus* and *Bacteroides* are associated with fatty acid and lipid
575 biosynthesis (Liu and Meng, 2008; Tanca et al., 2018). In this study, the relative abundances
576 of *Bacteroides* and *Lactococcus* were significantly higher in the PC group and are suggested
577 to be the main factors for the biosynthesis of basic elements. In addition to fatty acid and lipid
578 biosynthesis, *Lactococcus*, a dominant genus in our study, also produces exopolysaccharide
579 and aromatic compounds (Casalta and Montel, 2008). Our results indicated that the two
580 species showed considerable differences in gut microbiota functions. The higher gene
581 functions in PC group were focused on nutrient utilization, indicating that the gut microbiota
582 in golden apple snail has higher nutrient conversion capacity than the Chinese mud snail,
583 which helps the golden apple snail to improve survivability in unstable environment.

584 Conclusions

585 Our study provided a general understanding of the gut microbial community characteristics
586 between sympatric invasive golden apple snail and native Chinese mud snail. We found that
587 microbial abundance and community structure was significantly different between golden
588 apple snail and Chinese mud snail. The abundance and community structure of gut microbiota
589 in golden apple snail was higher and more complex than in Chinese mud snail, suggesting that
590 the golden apple snail may have the ability to digest a wider variety of food. In addition, we
591 found some specific bacterial phyla and genera of golden apple snail gut microbiota, which
592 can promote the ability to absorb and transform nutrients, helping golden apple snail to be
593 more invasive. These results revealed that the structure and function in microbiota
594 composition are the reasons why golden apple snail readily adapts to the new habitats.

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632 **Competing interests**

633 The authors declare that they have no competing interests.

634 **Authors Contributions**

635 Zhou ZH, Huang JL and Wu ZJ designed the study;
636 Zhou ZH, Wu HY, Li DH and Zeng WL performed the experiments and data analysis;
637 Zhou ZH drafted the manuscript;
638 Zhou ZH, Wu HY, Li DH, Zeng WL, Huang JL and Wu ZJ discussed the study design and
639 data analysis;
640 Huang JL and Wu ZJ revised the manuscript.

641 **Availability of data and materials**

642 The data are available at the National Center for Biotechnology Information (NCBI)
643 BioProject: PRJNA756881.

645 **References**

646 [Akbar S, Huang J, Zhou Q, Gu L, Sun Y, Zhang L, Lyu K, Yang Z. 2021](#). Elevated
647 temperature and toxic *Microcystis* reduce *Daphnia* fitness and modulate gut
648 microbiota. *Environmental Pollution*, **271**, DOI: 10.1016/j.envpol.2020.116409.

649 [Bankers L, Dahan D, Neiman M, Adrian, Tucci C, Frost C, Hurst G.D.D, King K.C, 2021](#).
650 Invasive freshwater snails form novel microbial relationships. *Evolutionary*
651 *Applications*, **14**:770-780, DOI: 10.1111/eva.13158.

652 [Becker A.A.M.J, Hill K.C, Butaye P. 2021](#). Unraveling the Gut Microbiome of the Invasive
653 Small Indian Mongoose (*Urva auropunctata*) in the Caribbean. *Microorganisms*, **9**,
654 DOI: 10.3390/microorganisms9030465.

655 [Benslama O, Boulahrouf A. 2016](#). High-quality draft genome sequence of *Enterobacter* sp.
656 Bisph2, a glyphosate-degrading bacterium isolated from a sandy soil of Biskra,
657 Algeria. *Genomics data*, **8**:61-66, DOI: 10.1016/j.gdata.2016.03.005.

658 [Bibbo S, Ianiro G, Giorgio V, Scaldaferrri F, Masucci L, Gasbarrini A, Cammarota G.](#)
659 [2016](#). The role of diet on gut microbiota composition. *European Review for Medical*
660 *and Pharmacological Sciences*, **20**:4742-4749.

661 [Brestoff J.R, Artis D. 2013](#). Commensal bacteria at the interface of host metabolism and the
662 immune system. *Nature Immunology*, **14**:676-684, DOI: 10.1038/ni.2640.

663 [Callahan B.J, McMurdie P.J, Rosen M.J, Han A.W, Johnson A.J.A, Holmes S.P. 2016](#).
664 DADA2: High-resolution sample inference from Illumina amplicon data. *Nature*
665 *Methods: Techniques for life scientists and chemists*, **13** DOI: 10.1038/NMETH.3869.

666 [Cardoso A.M, Cavalcante J.J.V, Cantao M.E, Thompson C.E, Flatschart R.B, Glogauer](#)
667 [A, Scapin S.M.N, Sade Y.B, Beltrao P.J.M.S.I, Gerber A.L, Martins O.B, Garcia](#)
668 [E.S, de Souza W, Vasconcelos A.T.R. 2012a](#). Metagenomic Analysis of the
669 Microbiota from the Crop of an Invasive Snail Reveals a Rich Reservoir of Novel
670 Genes. *Plos One*, **7**, DOI: 10.1371/journal.pone.0048505.

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761 **Cardoso A.M., Cavalcante J.J.V., Vieira R.P., Lima J.L., Grieco M.A.B., Clementino M.M.,**
762 **Vasconcelos A.T.R., Garcia E.S., de Souza W., Albano R.M., Martins O.B. 2012b.**
763 Gut Bacterial Communities in the Giant Land Snail *Achatina fulica* and Their
764 Modification by Sugarcane-Based Diet. *Plos One*, **7**, DOI:
765 10.1371/journal.pone.0033440.

766 **Carlos C., Fan H., Currie C.R. 2018.** Substrate Shift Reveals Roles for Members of Bacterial
767 Consortia in Degradation of Plant Cell Wall Polymers. *Frontiers in Microbiology*, **9**,
768 DOI: 10.3389/fmicb.2018.00364.

769 **Carlsson N.O.I., Nmark C.B., And L.A., Hansson. 2004.** Invading herbivory: the golden
770 apple snail alters ecosystem functioning in Asian wetlands. *Ecology*, **85**:1575-1580
771 DOI: 10.1890/03-3146.

772 **Casalta E., Montel M.-C. 2008.** Safety assessment of dairy microorganisms: the *Lactococcus*
773 genus. *International journal of food microbiology*, **126**:271-3. DOI:
774 10.1016/j.ijfoodmicro.2007.08.013.

775 **Cazzaniga N.J. 1990.** Predation of *Pomacea canaliculata* (Ampullariidae) on adult
776 *Biomphalaria peregriana* (Planorbidae). *Annals of tropical medicine and parasitology*,
777 **84**:97-100. DOI: 10.1080/00034983.1990.11812439.

778 **Chen L., Li S., Xiao Q., Lin Y., Li X., Qu Y., Wu G., Li H. 2021a.** Composition and diversity of
779 gut microbiota in *Pomacea canaliculata* in sexes and between developmental stages.
780 *BMC Microbiology*, **21**. DOI: 10.1186/s12866-021-02259-2.

781 **Chen L., Xu H., Li H., Wu J., Ding H., Liu Y. 2011a.** Isolation and Characterization of Sixteen
782 Polymorphic Microsatellite Loci in the Golden Apple Snail *Pomacea canaliculata*.
783 *International Journal of Molecular Sciences*, **12**:5993-5998. DOI:
784 10.3390/ijms12095993.

785 **Chen X., Lu D., Li Z., Yue W., Wang J., Jiang X., Han H., Wang C. 2021b.** Plant and
786 Animal-Type Feedstuff Shape the Gut Microbiota and Metabolic Processes of the
787 Chinese Mitten Crab *Eriocheir sinensis*. *Frontiers in Veterinary Science*, **8**. DOI:
788 10.3389/fvets.2021.589624.

789 **Chen Y., Penner G.B., Li M., Oba M., Guan L.L. 2011b.** Changes in Bacterial Diversity
790 Associated with Epithelial Tissue in the Beef Cow Rumen during the Transition to a
791 High-Grain Diet. *Applied and Environmental Microbiology*, **77**:5770-5781. DOI:
792 10.1128/aem.00375-11.

793 **Cui J., Shan B., Tang W. 2012.** Effect of periphyton community structure on heavy metal
794 accumulation in mystery snail (*Cipangopaludina chinensis*): A case study of the Bai
795 River, China. *Journal of Environmental Sciences*, **24**:1723-1730. DOI:
796 10.1016/s1001-0742(11)60976-5.

797 **Douglas G.M., Maffei V.J., Zaneveld J.R., Yurgel S.N., Brown J.R., Taylor C.M.,**
798 **Huttenhower C., Langille M.G.I. 2020.** PICRUSt2 for prediction of metagenome
799 functions. *Nature Biotechnology*, **38**:685-688. DOI: 10.1038/s41587-020-0548-6.

800 **Dugas J.E., Zurek L., Paster B.J., Keddie B.A., Leadbetter E.R. 2001.** Isolation and
801 characterization of a *Chryseobacterium* strain from the gut of the American cockroach,
802 *Periplaneta americana*. *Archives of microbiology*, **175**:259-262. DOI:
803 10.1007/s002030000243.

804 **Evans N.J., Brown J.M., Murray R.D., Getty B., Birtles R.J., Hart C.A., Carter S.D. 2011.**

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936 Characterization of Novel Bovine Gastrointestinal Tract *Treponema* Isolates and
937 Comparison with Bovine Digital Dermatitis Treponemes. *Applied and Environmental*
938 *Microbiology*, **77**:138-147, DOI: 10.1128/aem.00993-10.

939 **Fan J, Chen L, Mai G, Zhang H, Yang J, Deng D, Ma Y. 2019.** Dynamics of the gut
940 microbiota in developmental stages of *Litopenaeus vannamei* reveal its association
941 with body weight. *Scientific Reports*, **9**, DOI: 10.1038/s41598-018-37042-3.

942 **Gaikwad S.S, Shouche Y.S, Gade W.N. 2017.** Deep Sequencing Reveals Highly Variable
943 Gut Microbial Composition of Invasive Fish *Mossambicus Tilapia* (*Oreochromis*
944 *mossambicus*) Collected from Two Different Habitats. *Indian Journal of Microbiology*,
945 **57**:235-240, DOI: 10.1007/s12088-017-0641-9.

946 **Gallo B.D, Farrell J.M, Leydet B. 2020a.** Use of next generation sequencing to compare
947 simple habitat and species level differences in the gut microbiota of an invasive and
948 native freshwater fish species. *PeerJ*, **8**, DOI: 10.7717/peerj.10237.

949 **Gallo B.D, Farrell J.M, Leydet B.F. 2020b.** Fish Gut Microbiome: A Primer to an Emerging
950 Discipline in the Fisheries Sciences. *Fisheries*, **45**:271-282, DOI: 10.1002/fsh.10379.

951 **Gattorno M, Hofer M, Federici S, Vanoni F, Bovis F, Aksentijevich I, Anton J, Ignacio**
952 **Arostegui J, Barron K, Ben-Cherit E, Brogan P.A, Cantarini L, Ceccherini I, De**
953 **Benedetti F, Dedeoglu F, Demirkaya E, Frenkel J, Goldbach-Mansky R, Gul A,**
954 **Hentgen V, Hoffman H, Kallinich T, Kone-Paut I, Kuemmerle-Deschner J,**
955 **Lachmann H.J, Laxer R.M, Livneh A, Obici L, Ozen S, Rowczenio D, Russo R,**
956 **Shinar Y, Simon A, Toplak N, Touitou I, Uziel Y, van Gijn M, Foell D, Garassino**
957 **C., Kastner D, Martini A, Sormani M.P, Ruperto N, Eurofever Registry P. 2019.**
958 Classification criteria for autoinflammatory recurrent fevers. *Annals of the Rheumatic*
959 *Diseases*, **78**:1025-1032, DOI: 10.1136/annrheumdis-2019-215048.

960 **Gueell E.J, Maru B.T, Chimentao R.J, Gispert-Guirado F, Constanti M, Medina F. 2015.**
961 Combined heterogeneous catalysis and dark fermentation systems for the conversion
962 of cellulose into biohydrogen. *Biochemical Engineering Journal* **101**:209-219, DOI:
963 10.1016/j.bej.2015.06.004.

964 **Habineza P, Muhammad A, Ji T, Xiao R, Yin X, Hou Y, Shi Z. 2019.** The Promoting Effect
965 of Gut Microbiota on Growth and Development of Red Palm Weevil, *Rhynchophorus*
966 *ferrugineus* (Olivier) (Coleoptera: Dryophthoridae) by Modulating Its Nutritional
967 Metabolism. *Frontiers in Microbiology*, **10**, DOI: 10.3389/fmicb.2019.01212.

968 **Hook E.W, III. 2017.** Syphilis. *Lancet*, **389**:1550-1557, DOI:
969 10.1016/s0140-6736(16)32411-4.

970 **Hu Z, Chen X, Chang J, Yu J, Tong Q, Li S, Niu H. 2018.** Compositional and predicted
971 functional analysis of the gut microbiota of *Radix auricularia* (Linnaeus) via
972 high-throughput Illumina sequencing. *PeerJ*, **6**, DOI: 10.7717/peerj.5537.

973 **Hu Z, Tong Q, Chang J, Yu J, Li S, Niu H, Ma D. 2021.** Gut bacterial communities in the
974 freshwater snail *Planorbella trivolvis* and their modification by a non-herbivorous diet.
975 *PeerJ*, **9**, DOI: 10.7717/peerj.10716.

976 **Jin Y, Wu S, Zeng Z, Fu Z. 2017.** Effects of environmental pollutants on gut microbiota.
977 *Environmental Pollution*, **222**:1-9, DOI: 10.1016/j.envpol.2016.11.045.

978 **Kwong K.-I, Chan R.K.Y, Qiu J.-W. 2009.** The potential of the invasive snail *Pomacea*
979 *canaliculata* as a predator of various life-stages of five species of freshwater snails.

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1140 *Malacologia*, **51**:343-356 DOI: 10.4002/040.051.0208.

1141 **Lee W.-J., Hase K. 2014.** Gut microbiota-generated metabolites in animal health and disease. *Nature Chemical Biology*, **10**:416-424 DOI: 10.1038/nchembio.1535.

1142 **Li H., Li T., Beasley D.E., Hedenece P., Xiao Z., Zhang S., Li J., Lin Q., Li X. 2016.** Diet Diversity Is Associated with Beta but not Alpha Diversity of Pika Gut Microbiota. *Frontiers in Microbiology*, **7** DOI: 10.3389/fmicb.2016.01169.

1143 **Li L.-H., Lv S., Lu Y., Bi D.-Q., Guo Y.-H., Wu J.-T., Yue Z.-Y., Mao G.-Y., Guo Z.-X., Zhang Y., Tang Y.-F. 2019.** Spatial structure of the microbiome in the gut of *Pomacea canaliculata*. *BMC Microbiology*, **19** DOI:10.1186/s12866-019-1661-x.

1144 **Lin R., Liu W., Piao M., Zhu H. 2017.** A review of the relationship between the gut microbiota and amino acid metabolism. *Amino Acids*, **49**:2083-2090 DOI: 10.1007/s00726-017-2493-3.

1145 **Liu C., Dong Y., Hou L., Deng N., Jiao R. 2017.** Acidobacteria Community Responses to Nitrogen Dose and Form in Chinese Fir Plantations in Southern China. *Current Microbiology*, **74**:396-403 DOI: 10.1007/s00284-016-1192-8.

1146 **Liu H., Meng X. 2008.** Influence of acid adaptation on membrane-fatty acid profile and expression of membrane proteins in *Lactococcus lactis*. *Wei sheng wu xue bao = Acta microbiologica Sinica*, **48**:1459-65.

1147 **Lize A., McKay R., Lewis Z. 2013.** Gut microbiota and kin recognition. *Trends in Ecology & Evolution*, **28**:325-326 DOI: 10.1016/j.tree.2012.10.013.

1148 **Lowe S., Browne M., Boudjelas S., De Poorter M. 2000.** 100 of the world's worst invasive alien species a selection from the Global Invasive Species Database. *The Invasive Species Specialist Group of the Species Survival Commission of the World Conservation Union*, **12** pp.

1149 **Lyra M.L., Bletz M.C., Haddad C.F.B., Vences M. 2018.** The Intestinal Microbiota of Tadpoles Differs from Those of Syntopic Aquatic Invertebrates. *Microbial Ecology*, **76**:121-124 DOI: 10.1007/s00248-017-1109-5.

1150 **Mardinoglu A., Shoaie S., Bergentall M., Ghaffari P., Zhang C., Larsson E., Backhed F., Nielsen J. 2015.** The gut microbiota modulates host amino acid and glutathione metabolism in mice. *Molecular Systems Biology*, **11** DOI: 10.15252/msb.20156487.

1151 **Morrison W.E., Hay M.E. 2011.** Feeding and growth of native, invasive and non-invasive alien apple snails (*Ampullariidae*) in the United States: Invasives eat more and grow more. *Biological Invasions*, **13**:945-955 DOI: 10.1007/s10530-010-9881-x.

1152 **Nakanishi K., Takakura K.-I., Kanai R., Tawa K., Murakami D., Sawada H. 2014.** Impacts of environmental factors in rice paddy fields on abundance of the mud snail (*Cipangopaludina chinensis laeta*). *Journal of Molluscan Studies*, **80**:460-463 DOI: 10.1093/mollus/eyu054.

1153 **Navarrete A.A., Venturini A.M., Meyer K.M., Klein A.M., Tiedje J.M., Bohannon B.J.M., Nuesslein K., Tsai S.M., Rodrigues J.L.M. 2015.** Differential Response of *Acidobacteria Subgroups* to Forest-to-Pasture Conversion and Their Biogeographic Patterns in the Western Brazilian Amazon. *Frontiers in Microbiology*, **6** DOI: 10.3389/fmicb.2015.01443.

1154 **Nicolai A., Rouland-Lefevre C., Ansart A., Filser J., Lenz R., Pando A., Charrier M. 2015.** Inter-population differences and seasonal dynamic of the bacterial gut community in

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1329 the endangered land snail *Helix pomatia* (Gastropoda: Helicidae). *Malacologia*,
1330 **59**:177-190. DOI: 10.4002/040.059.0101.

1331 **Pawar K.D., Dar M.A., Rajput B.P., Kulkarni G.J. 2015.** Enrichment and Identification of
1332 Cellulolytic Bacteria from the Gastrointestinal Tract of Giant African Snail, *Achatina*
1333 *fulica*. *Applied Biochemistry and Biotechnology*, **175**:1971-1980. DOI:
1334 10.1007/s12010-014-1379-z.

1335 **Pemberton J.M., Kidd S.P., Schmidt R. 1997.** Secreted enzymes of *Aeromonas*. *FEMS*
1336 *microbiology letters*, **152**:1-10.

1337 **Pinheiro G.L., Correa R.F., Cunha R.S., Cardoso A.M., Chaia C., Clementino M.M., Garcia**
1338 **E.S., de Souza W., Frases S. 2015.** Isolation of aerobic cultivable cellulolytic bacteria
1339 from different regions of the gastrointestinal tract of giant land snail *Achatina fulica*.
1340 *Frontiers in Microbiology*, **6**. DOI: Artn 860.10.3389/Fmicb.2015.00860.

1341 **Puentes-Tellez P.E., Salles J.F. 2018.** Construction of Effective Minimal Active Microbial
1342 Consortia for Lignocellulose Degradation. *Microbial Ecology*, **76**:419-429. DOI:
1343 10.1007/s00248-017-1141-5.

1344 **Qu Y.-F., Wu Y.-Q., Zhao Y.-T., Lin L.-H., Du Y., Li P., Li H., Ji X. 2020.** The invasive
1345 red-eared slider turtle is more successful than the native Chinese three-keeled pond
1346 turtle: evidence from the gut microbiota. *PeerJ*, **8**. DOI: 10.7717/peerj.10271.

1347 **Radolf J.D., Caimano M.J., Stevenson B., Hu L.T. 2012.** Of ticks, mice and men:
1348 understanding the dual-host lifestyle of Lyme disease spirochaetes. *Nature Reviews*
1349 *Microbiology*, **10**:87-99. DOI: 10.1038/nrmicro2714.

1350 **Rahman N.A., Parks D.H., Vanwonderghem I., Morrison M., Tyson G.W., Hugenholtz P.**
1351 **2016.** A Phylogenomic Analysis of the Bacterial Phylum Fibrobacteres. *Frontiers in*
1352 *Microbiology*, **6**. DOI: 10.3389/fmicb.2015.01469.

1353 **Ringo E., Zhou Z., Vecino J.L.G., Wadsworth S., Romero J., Krogdahl A., Olsen R.E.,**
1354 **Dimitroglou A., Foey A., Davies S., Owen M., Lauzon H.L., Martinsen L.L., de**
1355 **Schryver P., Bossier P., Sperstad S., Merrifield D.L. 2016.** Effect of dietary
1356 components on the gut microbiota of aquatic animals. A never-ending story?
1357 *Aquaculture Nutrition*, **22**:219-282. DOI: 10.1111/anu.12346.

1358 **She Y.-Z., Wu J.-P., Zhang Y., Peng Y., Mo L., Luo X.-J., Mai B.-X. 2013.** Bioaccumulation of
1359 polybrominated diphenyl ethers and several alternative halogenated flame retardants
1360 in a small herbivorous food chain. *Environmental Pollution*, **174**:164-170. DOI:
1361 10.1016/j.envpol.2012.11.024.

1362 **Sommer F., Stahlman M., Ilkayeva O., Arnemo J.M., Kindberg J., Josefsson J., Newgard**
1363 **C.B., Frobert O., Backhed F. 2016.** The Gut Microbiota Modulates Energy
1364 Metabolism in the Hibernating Brown Bear *Ursus arctos*. *Cell Reports*, **14**:1655-1661.
1365 DOI: 10.1016/j.celrep.2016.01.026.

1366 **Takacs-Vesbach C., King K., Van Horn D., Larkin K., Neiman M. 2016.** Distinct Bacterial
1367 Microbiomes in Sexual and Asexual *Potamopyrgus antipodarum*, a New Zealand
1368 Freshwater Snail. *Plos One*, **11**. DOI: 10.1371/journal.pone.0161050.

1369 **Tanca A., Abbondio M., Palomba A., Fraumene C., Marongiu F., Serra M., Pagnozzi D.,**
1370 **Laconi E., Uzzau S. 2018.** Caloric restriction promotes functional changes involving
1371 short-chain fatty acid biosynthesis in the rat gut microbiota. *Scientific Reports*, **8**. DOI:
1372 10.1038/s41598-018-33100-y.

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1518 **Thomas F, Hehemann J.H, Rebuffet E, Czjzek M, Michel G. 2011.** Environmental and gut
1519 Bacteroidetes: the food connection. *Frontiers in Microbiology*, **2**, DOI:
1520 10.3389/fmicb.2011.00093.

1521 **Torbjörn R, Tomáš F, Ben N, Christopher Q, Frédéric M. 2016.** VSEARCH: a versatile
1522 open source tool for metagenomics. *PeerJ*, **4** DOI: [10.7717/peerj.2584](https://doi.org/10.7717/peerj.2584).

1523 **Turnbaugh P.J, Ley R.E, Mahowald M.A, Magrini V, Mardis E.R, Gordon J.I. 2006.** An
1524 obesity-associated gut microbiome with increased capacity for energy harvest. *Nature*,
1525 **444**:1027-31, DOI: 10.1038/nature05414.

1526 **Van Horn D.J, Garcia J.R, Loker E.S, Mitchell K.R, Mkoji G.M, Adema C.M,
1527 Takacs-Vesbach C.D. 2012.** Complex intestinal bacterial communities in three
1528 species of planorbid snails. *Journal of Molluscan Studies*, **78**:74-80, DOI:
1529 10.1093/mollus/eyr038.

1530 **Waite D.W, Vanwongerhem I, Rinke C, Parks D.H, Zhang Y, Takai K, Sievert S.M,
1531 Simon J, Campbell B.J, Hanson T.E, Woyke T, Klotz M.G, Hugenholtz P. 2017.**
1532 Comparative Genomic Analysis of the Class Epsilonproteobacteria and Proposed
1533 Reclassification to *Epsilonbacteraeota* (phyl. nov.). *Frontiers in Microbiology*, **8**, DOI:
1534 10.3389/fmicb.2017.00682.

1535 **Wang Y, Huang J.-M, Zhou Y.-L, Almeida A, Finn R.D, Danchin A, He L.-S. 2020a.**
1536 Phylogenomics of expanding uncultured environmental Tenericutes provides insights
1537 into their pathogenicity and evolutionary relationship with Bacilli. *BMC Genomics*, **21**,
1538 DOI: 10.1186/s12864-020-06807-4.

1539 **Wang Y, Liu M, Wang B, Jiang K, Wang M, Wang L. 2020b.** Response of the *Litopenaeus*
1540 *vananmei* intestinal bacteria and antioxidant system to rearing density and exposure to
1541 *Vibrio parahaemolyticus* E1. *Journal of Invertebrate Pathology*, **170**, DOI:
1542 10.1016/j.jip.2020.107326.

1543 **Weiss B, Oliveira Souza A.C, Lima Constancio M.T, Alvarenga D.O, Pylro V.S, Alves
1544 L.M.C, Varani A.M. 2021.** Unraveling a Lignocellulose-Decomposing Bacterial
1545 Consortium from Soil Associated with Dry Sugarcane Straw by Genomic-Centered
1546 Metagenomics. *Microorganisms*, **9**, DOI: 10.3390/microorganisms9050995.

1547 **Whittaker R.H. 1972.** Evolution and measurement of species diversity. *Taxon*, **21**.

1548 **Xiong J. 2018.** Progress in the gut microbiota in exploring shrimp disease pathogenesis and
1549 incidence. *Applied Microbiology and Biotechnology*, **102**:7343-7350, DOI:
1550 10.1007/s00253-018-9199-7.

1551 **Zhang F, Sun X.X, Zhang X.C, Zhang S, Lu J, Xia Y.M, Huang Y.H, Wang X.J. 2018.**
1552 The interactions between gut microbiota and entomopathogenic fungi: a potential
1553 approach for biological control of *Blattella germanica* (L.). *Pest Management Science*,
1554 **74**:438-447, DOI: 10.1002/ps.4726.

1555 **Zhang Y, Li Z, Kholodkevich S, Sharov A, Chen C, Feng Y, Ren N, Sun K. 2020.** Effects
1556 of cadmium on intestinal histology and microbiota in freshwater crayfish
1557 (*Procambarus clarkii*). *Chemosphere*, **242**, DOI: 10.1016/j.chemosphere.2019.125105.

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1699 **Figure 1** Alpha diversity index summary. Chao 1 and Observed species indexes represent
1700 community richness; Shannon and Simpson represent diversity; Faith's PD represent the
1701 diversity of evolution; Pielou's evenness represent evenness; Good's coverage represent
1702 coverage. * $P < 0.05$ represent significant level.

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1704 **Figure 2** NMDS and ANOSIM analysis based on (A, C) Bray-Curtis and (B, D) weighted
1705 UniFrac distances of gut microbiota on OTU level. The NMDS ordination revealed a
1706 significant difference based on Bray-Curtis ($P = 0.034$) and on weighted UniFrac distances (P
1707 = 0.031) between PC and CC groups. The ANOSIM revealed a significant difference based on
1708 Bray-Curtis ($P = 0.027$) and on weighted UniFrac distances ($P = 0.03$) between PC and CC
1709 groups. Part of the dots have overlapped (A and B).

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1711 **Figure 3** Relative abundance of top 10 OTU's for *P. canaliculata* (PC) and *C. chinensis* (CC)
1712 at the phylum level.

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1714 **Figure 4** Relative abundance of top 10 OTU's for *P. canaliculata* (PC) and *C. chinensis* (CC)
1715 at the genus level.

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1717 **Figure 5** Gut microbiota predictive metabolic functions from KEGG database in all samples.
1718 The color-bar indicates gene function (level 1). Detailed descriptions are shown on the left
1719 side (level 2). The lines at the top of the figure have shown the KEGG level as well.

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Figure S2 The content of operational taxonomic units (OTUs) and different bacterial taxonomic units of each sample.

Figure S3 Venn diagram of shared and unique OTUs among different groups.

Figure S4 The linear discriminant analysis (LDA) of two groups with the LDA >2.

Figure S5 PCoA analysis based on (a) unweighted and (b) weighted Unifrac distances of gut microbiome on OTU level.

Figure S6 The prediction of two groups in KEGG database in different annotation abundance....

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