

# 水生生物学报 2022 年第 46 卷

## 总 目 次

### 第 1 期

#### 长江十年禁渔

十年禁渔是长江大保护的重要举措 .....	曹文宣	(1)
基于eDNA技术的长江上游珍稀特有鱼类国家级自然保护区重庆段鱼类多样性研究 .....		
..... 王梦杨鑫 王维段聪 刘智皓 陈启亮 李英文 沈彦君	(2)	
三峡库区短颌鲚年龄和生长特性的研究 .....	杨丽亚 吕红健 付梅 白云鹏 苏胜齐 姚维志	(17)
三峡水库光泽黄颡鱼年龄、生长与死亡特征研究 .....	廖传松 李为苑 晶 叶少文 张堂林 刘家寿	(29)
金沙江中下游圆口铜鱼遗传多样性与种群历史动态分析 .....	何勇凤 朱永久 龚进玲 朱挺兵 吴兴兵 李学梅 孟子豪 杨德国	(37)

#### 水生态与环境

饲料脂肪水平对长养殖周期异育银鲫“中科3号”生长和脂代谢的影响 .....		
..... 费树站 巫丽云 郭伟 刘昊昆 韩冬 金俊琰 杨云霞 朱晓鸣 解绶启	(48)	
饲料能量密度和投喂水平对吉富罗非鱼生长和健康的影响 .....		
..... 刘伟 蒋明 吴凡 田娟 陆星 喻丽娟 文华	(58)	
亚东鲤幼鱼饲料中适宜淀粉种类与水平的研究 .....	党江雨 高擘为 徐禛 杨航 李小勤 冷向军	(69)
低蛋白饲料对杂交黄颡鱼幼鱼生长性能、体组成、转氨酶活性和抗氧化能力的影响 .....		
..... 杨贺舒 孙俊霄 杨慧君 樊启学 袁勇超	(79)	
饥饿胁迫对克氏原螯虾生理生化和肠道健康的影响 .....		
..... 赖婷 聂子盈 张小雨 孙存鑫 徐骁迪 蒋青 刘明阳 刘波 王爱民	(88)	

#### 渔业与生物技术

黄颡鱼溶酶体酸性脂肪酶基因的cDNA序列、启动子及其转录调控分析 .....		
..... 谌芳 仲崇超 陈姝为 张电光 吕武宏 谭肖英	(98)	
低氧对斑马鱼胚胎心脏和血管发育及相关基因表达的影响 .....		
..... 姜宇 杨明阳 叶勤 陶怡曦 徐浩 李云	(115)	
尼罗罗非鱼 $traf6$ 基因表达谱及信号转导 .....		
..... 韩雪晴 高风英 刘志刚 曹建萌 可小丽 王森 衣萌萌 高艳侠 卢迈新	(125)	
金鱼雌核发育单倍体胚胎血液循环障碍产生机制 .....	张琼宇 唐甲卉 彭娟 唐鹏程 孙远东	(126)
综述 .....		
环境DNA在湖泊生物多样性研究中的应用 .....	邢迎春 高婉茹 白洁 赵亚辉	(137)

### 第 2 期

#### 藻类与环境

南水北调中线干渠异味物质时空动态及其影响因素 .....		
..... 王愿珠 张春梅 毕永红 朱宇轩 宋高飞 王树磊 梁建奎 米武娟	(149)	
基于孢子粘附功能的大型海藻生态修复技术研究 .....	毕远新 苗航 王惠杰 杨起帆	(160)
大型海藻裂片石莼藻粉对赤潮异弯藻光合作用抑制的研究 .....	余娇娇 刘洪 张超雯 赵建刚 叶长鹏	(168)
神经毒素BMAA在淡水池塘水体中的健康风险及调控技术 .....		
..... 顾笑笑 吴湘 张爱 俞程强 杨林浩 孙怡 李珍珍	(176)	
利用脱落酸和冷适应提高坛紫菜丝状体种质的冻存效率 .....		
..... 马明婕 韦彩玲 朱骏凯 刘棋琴 骆其君 陈海敏 杨锐	(184)	
昼夜温差对三角褐指藻和赤潮异弯藻生长和叶绿素荧光特性的影响 .....		
..... 李建安 王佳妤 梅熠辉 陈梅玲 周成旭 李亚鹤	(194)	
营养缺失对具鞘微鞘藻胞外多糖和糖原分配模式的影响 .....		
..... 葛红梅 周雅茹 柳诗莺 王贤哲 韩兴烨 汪淑廉 胡春香	(203)	

解淀粉芽孢杆菌对三角褐指藻的化感作用研究 .....	任国梁 董志国 李德盛 夏 青 柳佳玲 崔振权 梁夏菲	(210)
东海原甲藻对羊栖菜合子生长及光合活性的化感作用研究 .....	王彩霞 贾 阳 秦文莉 陈斌斌 王 敏 马增岭	(216)
<b>生物技术与资源</b>		
斑马鱼食源性肠炎模型及其免疫细胞成像分析方法的建立 .....	黎 明 谢家元 赵旭阳 李晓敏 王 锐 单俊玮 程莹寅 张婉婷 吴 南 夏晓勤	(226)
感染GCRV的草鱼miRNA测序与比较分析 .....	肖调义 龙 哲 李 彬 张秋实 秦 玲 熊舒婷	(238)
克氏原螯虾一种新型甲壳素基因的鉴定和抑菌功能研究 .....	焦厚琪 霍诗天 闫黎明 李艳和 刘学芹	(248)
饲料中复方中草药对大菱鲆生长、饲料利用及非特异性免疫的影响 .....	高学政 张配瑜 史雪莹 贡玲芝 郭晴晴 刘海燕	(257)
沙柳河青海湖裸鲤早期资源发生量及时空分布 .....	谈龙飞 徐东坡 祁洪芳 方弟安 丁隆强 阿怀云 李元冬 吴艳红 毛成诚	(265)

### 第3期

<b>渔业与生物技术</b>		
鳜 <i>plin2</i> 生物信息学分析、组织表达及其在肝脏脂肪蓄积中的作用 .....	高俊杰 梁旭方 蔡文静 庄武元	(273)
西里伯斯青鳉 <i>tyr</i> 和 <i>slc24a5</i> 的克隆及表达分析 .....	马 元 仲 颖 郭 婕 李名友	(282)
斑马鱼肌肉高表达基因近端非编码元件分析及功能检测 .....	鲁程成 赵一凡 范纯新 王 建	(292)
斑马鱼 <i>elovl8</i> 缺失对抗冷胁迫下存活率及脂肪代谢的影响 .....	王玉梅 孙守向 何嘉欣 杨 刚 高 坚	(303)
miR-139555及其靶基因 <i>PtNBC</i> 在三疣梭子蟹适应盐度胁迫中的表达调控 .....	赵笑颜 吕建建 张 文 吴 捷 金 玲 刘 萍	(316)
中华鳖 <i>STING</i> 基因的克隆及功能分析 .....	陈 明 周谢菲 高建军 朱庭耀 彭佳诚 徐海圣	(324)
基于微滴式数字PCR方法的鱼类环境DNA样本处理与保存技术优化 .....	王 月 刘焕章 李 莎 俞 丹	(332)
基于同源双交换的聚球藻PCC 7942基因组大片段无标记删除 .....	柯竹芳 徐旭东 高 宏	(342)

<b>生物多样性与资源</b>		
傀儡湖似刺鳊𬶋种群生长特征及资源量评估研究 .....	蔡杏伟 郭 超 廖传松 李 为 樊厚瑞 刘家寿	(348)
西湖水域外来生物福寿螺的种类鉴定及种群遗传多样性研究 .....	李迦南 赵星星 王 恩 王 道 钱周兴 张 洋 杨倩倩 俞晓平	(355)
新疆塔里木河叶尔羌高原鳅遗传多样性研究 .....	赵文浩 易少奎 苏君晓 周 琼 沈建忠 李大鹏 周小云	(364)
柳江鱼类群落结构及多样性研究 .....	朱书礼 陈蔚涛 李新辉 李 捷 李跃飞	(375)
基于线粒体D-loop区的抚仙湖鱂浪白鱼遗传多样性分析 .....	吴俊颉 李光华 金方彭	
赵静霞 雷春云 高海涛 符世伟 周 睿 罗永新 薛绍伟 张文魁 冷 云 梁用本 马春明 王 艳	(385)	

<b>水生态与环境</b>		
持续高温胁迫对克氏原螯虾生长、消化酶活性与免疫指标的影响 .....	何乃娟 阮国良 刘玉林 方 刘 王 乾 付运银 李生瑄 李青松	(395)
高营养级捕食者在浅水湖泊沿岸带与敞水区能量耦合的维持作用 .....	徐 瑛 祝孔豪 郭钰伦 王 康 王 钊	(403)
不同施肥模式对克氏原螯虾稻田养殖水体浮游植物群落结构的影响 .....	王海艳 毛文静 董泽涛 杨 军 朱建强	(410)
水华微囊藻混凝沉降去除过程中铝盐回收及循环使用 .....	于桐泊 李莉莉 程绍哲 张海阳 张学治	(419)

<b>综述</b>		
稳定同位素质量平衡混合模型的性能评估 .....	祝孔豪 李 斌 王 康 郭钰伦 王维康 徐 军	(427)

### 第4期

<b>营养与免疫</b>		
玉屏风多糖合生元对热应激草鱼免疫性能的影响 .....	刘 华 邓桃球 史银魁 于 辉 杨 映 施益如 蔡明焓 段玉婉	(439)

氨氮和镉胁迫对芙蓉鲤鲫抗氧化系统和免疫机能的影响 .....	高金伟 吴 浩 李绍明 谢 敏 李文祥 宋 锐 (448)
饲料中添加椭圆栅藻对异育银鲫中科5号越冬后抗病力的影响 .....	许文婕 夏 雨 朱晓鸣 韩 冬 刘昊昆 杨云霞 解绶启 高 宏 金俊琰 (457)
发酵豆粕替代鱼粉对大口黑鲈幼鱼生长、脂质代谢、血清非特异性免疫及肠道菌群的影响 .....	黄 河 田鑫鑫 黄旭雄 陈乃松 钟国防 (466)
低鱼粉饲料中添加苏氨酸对三倍体虹鳟抗氧化能力、消化生理及肠道炎症因子基因表达的影响 .....	王亚玲 王常安 刘红柏 韩世成 陆绍霞 张 颖 (478)
饲料中添加苜蓿草粉对草鱼生长、肌肉品质和血清抗氧化指标的影响 .....	童方乐 唐 涛 魏泽宏 胡 毅 刘少军 (488)
低氧-复氧胁迫对鲢抗氧化酶活性及Cu/Zn-SOD和Mn-SOD基因表达的影响 .....	张美东 凌 晨 沙 航 陈 梦 王 丹 罗相忠 邹桂伟 梁宏伟 (498)
饥饿再投喂对大鳞副泥鳅生长性能、肝脏抗氧化能力和肠道消化酶的影响 .....	蔡明成 孙翰昌 谢明地 李淳鸿添 赵胤年 樊汶樵 杨 帆 (507)
<b>水产动物疾病</b>	
草鱼感染GCRV后血液中淋巴细胞变化及BCL10表达分析 .....	姜祝祥 郭早枣 郑国栋 邹曙明 (514)
大黄鱼ATG10基因的分子特征及其在抗病毒免疫中的功能 .....	魏祖运 卢利霞 任秋磊 何天良 陈新华 (521)
鲤Pdcd6ip蛋白真核表达载体的构建及抗病毒功能研究 .....	邵 玲 张明辉 彭军辉 (529)
siRNA干扰对鲤疱疹病毒II型ORF57基因表达的影响 .....	金李萍 潘晓艺 蔺凌云 姚嘉贊 曹 铮 尹文林 赖迎迢 陶家发 刘忆瀚 沈锦玉 (537)
葡萄碘泡虫、似葡萄碘泡虫和茄形碘泡虫的鉴别及系统发育 .....	谭禄奇 周 杨 王苗苗 杨承忠 赵元著 (545)
尖形碘泡虫(黏体门: 碘泡虫科)的重描述及其分子系统学研究 .....	石小威 王 茂 陈鸿真 高 磊 刘晓聪 杨承忠 赵元著 (555)
<b>渔业与生物技术</b>	
过表达miR-9对黄鳝受精卵中基因转录组水平的影响 .....	薛凌展 袁 英 毕保良 孔令富 严 晖 李大鹏 高 宇 (563)
三种四膜虫全基因组N <sup>6</sup> -甲基腺嘌呤比较研究 .....	王 粟 柴小翠 张 晶 杨文涛 袁冬霞 熊 杰 (574)
中国对虾Gs基因克隆及其在急性低盐胁迫下功能分析 .....	周雨欣 何玉英 李 健 魏 威 王 琼 谢拥军 (584)
盐胁迫对于聚球藻PCC 7942大片段DNA删除突变株的生理效应 .....	许 轶 徐旭东 (592)
<b>综述</b>	
南极鱼类后生动物寄生虫研究进展: 线虫、绦虫与桡足类 .....	朱国平 宁 静 (598)

## 第 5 期

<b>生物多样性与资源</b>	
基于声学标记追踪法的湖泊鱼类时空分布研究 .....	石 磊 叶少文 朱 浩 纪 翔 王佳成 刘传昂 刘家寿 刘兴国 (611)
华东中南部山区淡水鱼类物种多样性及动物地理区划 .....	唐文乔 宋小晶 张 亚 (621)
嘉陵江中游蓬安段鱼类群落功能多样性研究 .....	张 倩 曾 燿 肖 瑾 向伶俐 鲍江辉 张朝硕 米湘媛 段 明 (630)
银鲳消化道形态与组织学结构特征及其消化酶活性 .....	唐道军 刘 洋 郑学斌 倪君杰 侯聪聪 王亚军 徐善良 张春丹 金 珊 徐万土 竺俊全 (643)
鼋骨骼系统及与中华鳖比较 .....	谢敏敏 洪孝友 李 伟 刘晓莉 陈 辰 朱新平 (654)
<b>水生态与环境</b>	
5种光周期对锦鲤生长、能量收支及生物钟基因表达的影响 .....	史东杰 王文峰 李文通 魏 东 王赛赛 姜巨峰 (664)
池塘圈养密度对大口黑鲈生长性能和健康状况的影响 .....	张 奇 侯 杰 杨 军 廖伟坚 卢建超 何绪刚 (671)

溶解氧水平对青海湖裸鲤体肾组织结构及抗氧化酶活性的影响	陈付菊 赵宇田 付生云 李雪源	(679)
水相Cd <sup>2+</sup> 在南美白对虾体内的富集及氧化应激特征	梅光明 朱羽庄 杨盈悦 顾捷 张小军 杨文鸽	(687)
基于稳定同位素技术的保安湖食物网结构特征研究	陈俊伊 王康 郭钰伦 祝孔豪 巴爱荣 刘云 赵康顺	(699)
湖北长湖夏、秋季浮游生物功能群特征及主要影响因子	龚森森 李学梅 吴嘉伟 柴毅 杨德国 谭凤霞 朱挺兵	(707)
<b>渔业与生物技术</b>		
花斑裸鲤胚胎/仔鱼型血红蛋白基因家族成员鉴定与时序表达研究	王发艳 刘丹 高强 晁燕 聂苗苗 杨朝杰 倪伟琳 王丽晗 祁得林	(718)
基于微卫星分析的长丰鮰种质资源遗传监测	罗相忠 覃维敏 梁宏伟 沙航 邹桂伟	(725)
静水压诱导翘嘴鳜雌核发育的研究	李勇明 桂彬 黎阳雨 李扬扬 陈亮明 黄容 廖兰杰 汪亚平	(735)
温度对池蝶蚌雌雄同体和性逆转的影响	徐红琴 马慧妹 曾起 胡蓓娟 盛军庆 洪一江	(741)
浮萍棘尾虫 <i>Adss</i> 基因克隆及表达载体构建	王影 范金凤 张晴 陈瑛	(754)
葛仙米血红素氧合酶基因 <i>Ns-HO1</i> 异源表达及其蛋白结构模拟	黄卉 陈莉 汪海洋 方庆 程超	(761)
<b>综述</b>		
基于稳定同位素的消费者营养来源溯源的方法和过程	王康 祝孔豪 郭钰伦 徐军	(767)

## 第6期

人工模拟条件下青海湖裸鲤自然繁殖环境条件需求研究	周杨浩 荣义峰 周卫国 刘黄欣 王谱渊 俞录贤 付生云 杨建新 祁洪芳 杜浩	(779)
两种生态相关猎物鱼个性的种间差异及其捕食者效应	李秦蕾 刘香 张宁 夏静怡 郑雪丽 夏继刚	(788)
模拟捕食者风险对大黄鱼幼鱼行为、游泳能力及应激水平的影响	王莉平 张东 刘鑫 林听听 刘声宇 王孝杉 李思平	(796)
齐口裂腹鱼上溯过程中“冲刺-滑行”行为对水动力的响应	李沁芝 邓月曦 唐锡良 严忠銮 王小明 卢晶莹 李嘉 安瑞冬	(811)
中华倒刺鲃幼鱼能量代谢特征个体差异及生态关联	罗玉莲 庞旭 刘蒨莹 张永飞 付成 付世建	(820)
摄食和饥饿对大口黑鲈游泳运动能力和低氧耐受的影响	谭淦 史函颖 陈拥军 林仕梅 李云 庞旭	(826)
中华绒螯蟹幼蟹温度选择与偏好研究	陈永进 周彦锋 徐东坡	(832)
个性对中华倒刺鲃群体运动特征和食物占有能力的影响	付翔 付成 樊捷 肖玲韬 付世建	(838)
刺参对生境的选择性及其行为生理响应	姜玉山 宋亚彩 方玲 吕菲 张沛东	(847)
个体大小对草鱼耐高温能力及升温过程中群体行为的影响	李武新 付世建 秦丽萍 曾令清	(856)
河川沙塘鳢对猎物种类和大小选择性研究	任艳 马琴 刘怡然 谢德兵 胡少迪 王辉 史阳白 李波 朱思华	(865)
宽鳍𫚭个性与维持代谢、食物占有能力和日常能量消耗的关联	胡月 唐金玉 付成 付世建	(872)
学习记忆通路抑制剂T-5224和KN-62对翘嘴鳜 <i>c-fos</i> 及味觉受体 <i>tIr1</i> 表达的影响	肖倩倩 梁旭方 庄武元 蔡文静	(880)
不同发育阶段中华绒螯蟹对底质的喜爱性研究	李春波 黄晓荣 冯广朋 庄平 耿智 伍烨菱	(888)
萼花臂尾轮虫对晶囊轮虫反捕食行为及形态响应的母体效应	何雨晗 张欢 祝孔豪 赵康顺 李海露 徐军	(896)
基于在线生物监测系统的氨氮胁迫下斑马鱼行为响应	何雅琪 任宗明	(903)
基于帧间光流特征和改进RNN的草鱼摄食状态分类	刘世晶 涂雪滢 钱程 周捷 陈军	(914)
<b>综述</b>		
动物个性和行为集:概念、测试和分析	李思平 张东 段明	(922)

## 第7期

### 生物多样性与资源

- 基于线粒体CO I基因的9个青鱼群体遗传变异分析 ..... 鲍生成 包天杰 王沈同 徐晓雁 代雅凡 张家华 李家乐 沈玉帮 (933)  
从江及周边地区稻田鲤的遗传结构及系统发育关系 ..... 余科 麻智芳 安苗 罗均 黄胜 梁志强 邵俭 潘秋芝 任芳 龙金梅 (939)  
山东近海三种底层鱼类的摄食生态与食物竞争 ..... 韩方成 李凡 冯媛 刘利军 钮春香 许叶鹏 任一平 薛莹 (951)  
瓯江口凤鲚鱼卵、仔稚鱼的时空分布及其与环境因子关系 ..... 孙浩奇 蒋日进 陈峰 茹银 李霞芳 李振华 印瑞 周永东 (963)

### 水生态与环境

- 井冈山地区莲鱼复合种养模式效益评价 ..... 米湘媛 张朝硕 张晓娟 王海华 郭小泽 李思明 赵大显 洪一江 段明 (983)  
南水北调中线总干渠水中重金属含量及风险评价 ..... 郭勇勇 华江环 朱宇轩 宋高飞 李瑞雯 韩建 杨丽华 周炳升 (995)  
褐菖鲉养殖密度与其eDNA的相关关系探讨 ..... 高天翔 陈治 王晓艳 张浩博 史会来 (1007)  
不同养殖模式下三倍体虹鳟鱼肉品质差异的研究 ..... 管玲玲 刘小红 田海宁 励建荣 孟玉琼 马睿 (1016)  
水体pH对尼罗罗非鱼生长、营养组成和肉质的影响 ..... 顾亭亭 吕宏波 王月 杜震宇 乔芳 (1029)  
双氢青蒿素对嗜热四膜虫的毒性效应 ..... 潘厚军 邓美玲 古欣婷 郑巧银 刘雨果 (1038)

### 水生植物生理与生态

- 高浓度CO<sub>2</sub>与磷浓度对葛仙米生长和光合作用的耦合效应 ..... 郭宏勇 朱俊杰 沈伊洁 王茜 金鹏 夏建荣 (1045)  
液相色谱-串联质谱法定量分析莱茵衣藻1,3-二油酸-2-棕榈酸甘油三酯 ..... 鲁媛晨 李艳华 余丽华 韩丹翔 马海燕 (1052)  
藻类连续培养体系的构建与优化及其在产毒和无毒微囊藻竞争中的应用 ..... 左俊 曾佳颖 杨丝雨 宋立荣 甘南琴 (1060)  
滇池外海藻类时空分布及其与环境因素间非线性相关分析 ..... 施凤宁 阳辉 刘湘伟 王雨春 苏禹铭 胡明明 包宇飞 李姗泽 温洁 (1070)  
纳米氢氧化铜暴露对水培生菜生长变化的影响 ..... 丁润润 童玲 张议戈 高露露 史鸿飞 章伟成 方涛 (1080)  
六种沉水植物的克隆生长特征 ..... 姚轶倩 袁昌波 吕超超 曹特 张霄林 倪乐意 (1088)  
基于人工培养的浮萍快速无性繁殖营养条件研究 ..... 高晓钰 曹特 倪乐意 张霄林 丑庆川 (1097)

## 第8期

### 渔业与生物技术

- 伯氏肩孔南极鱼dusp1基因在冷应激中的功能研究 ..... 王映 胡玲红 王化敏 陈良标 (1105)  
中华倒刺鲃TRPV1基因的克隆及对高温和LPS刺激的响应 ..... 刘耀辉 谢云龙 张子恒 杨馨悦 卢敏芳 蒲德永 王志坚 张耀光 刘小红 (1113)  
基于微流控芯片的鲑科鱼类单核苷酸多态性分型系统构建 ..... 赵紫霞 许建 吴碧银 曹顶臣 白庆利 徐鹏 马卓君 (1120)  
拟柱孢藻N8全基因组测序及磷吸收转运通路的比较分析 ..... 陈志江 阮紫曦 程楠 肖利娟 彭亮 韩博平 雷腊梅 (1130)  
扬子鳄FoxO1基因CDS序列的克隆及其在初孵鳄性腺组织的时空表达规律 ..... 温月 胡诚诚  
汪仁平 夏勇 夏同胜 何明月 周永康 张童欣 张军 庞宇 王浩 沈新禹 聂海涛 吴孝兵 (1142)  
罗氏沼虾转录组SSR标记筛选及其与体质量相关性分析 ..... 陈雪峰 王春琳 李荣华 顾志敏 徐宾朋 程海华 彭菲 (1150)

日本对虾 <i>Bcl-2</i> 基因的cDNA克隆与抗寒功能研究 .....	邵慧鑫 任宪云 于振兴 李健 刘萍(1160)
厚壳贻贝 <i>McCaspase 3-4</i> 基因的克隆及其在幼虫变态中的作用 .....	刘志显 李嘉政 梁邻利 冯丹丹 梁箫 杨金龙 竹攸汀(1168)
<b>水生态与环境</b>	
饲料中添加胆酸钠对大口黑鲈生长及糖代谢的影响 .....	丁斐斐 周楠楠 张乐 乔芳 杜震宇 张美玲(1177)
大口黑鲈对六种非粮蛋白源的表观消化率 .....	时于惠 祝书杰 谭北平 张文兵 周小秋 部卫华 迟淑艳(1187)
虹鳟幼鱼对不同淀粉的利用 .....	党江雨 蔡友旺 张春燕 曹凯林 李小勤 冷向军(1197)
黄鳝饲料蛋白质需求量的研究 .....	姜文灏 杨鑫 周秋白 王自蕊 高森 王颖 胡重华 张文平(1205)
美洲鳗鲡幼鱼饲料中鱼油的适宜添加水平研究 .....	瞿倩 赵盼月 蔡国鹤 翟少伟(1215)
越冬胁迫对草鱼抗氧化能力及脂肪酸组成的影响 .....	武文一 吉红(1223)
氨氮胁迫下不同食性鱼类仔鱼抗氧化和非特异性免疫的差异响应 .....	
.....吴雪阳 郭红会 况宇 张策 杨慧 汤蓉 张曦 李大鹏 李莉(1237)	
低氧胁迫和螺原体感染对中华绒螯蟹存活和细胞凋亡的影响 .....	
.....汪雅琴 黄晨 耿超 缪艳阳 陆银月 顾伟 王文 孟庆国(1249)	
低温胁迫下两种不同形态群体拟穴青蟹转录组分析 .....	陈洁 董梦 崔悦 房翠莲 陈旭堂 刘子明(1256)
<b>综述</b>	
生物活性产品角鲨烯的特性及其开发应用 .....	程鹏飞 王海霞 伯亚慧 周成旭 严小军(1265)

## 第9期

### 渔业与生物技术

雄激素受体缺乏抑制肝脏Vtg合成导致卵巢发育障碍 .....	
.....李天慧 翟刚 贺江燕 娄气永 金霞 杜震宇 肖武汉 殷战(1277)	
克氏原螯虾Rab5、Rab6蛋白及其抗体对血淋巴细胞吞噬活性的影响 .....	
.....朱雷 赵彤 王欣茹 蒋昕彧 侯立波 孔祥会(1285)	
草鱼呼肠孤病毒VP7蛋白单克隆抗体的制备与应用 .....	
.....季宁 魏伟 郭家鸿 王俊亚 李耀国 肖调义 邹钧(1293)	
日本鳗鲡肠道N-乙酰- $\beta$ -D-氨基葡萄糖苷酶的分离纯化及酶学性质 .....	林建城 胡建辉 吴钦端(1301)
三角褐指藻 <i>dxs</i> 基因克隆与诱导表达 .....	舒明雨 龚一富 吕欣梦 贾泽茗 王博 刘瑄瑄 王何瑜(1310)
莱茵衣藻BBS8蛋白的原核表达、纯化及多克隆抗体的制备 .....	李文娟 贾航 薛斌 樊振川(1319)

### 水生态与环境

典型河蟹养殖池塘不同养殖阶段水体微塑料特征 .....	谢莘昊 熊雄 胡红娟 吴辰熙(1325)
不同健康状态的棘胸蛙肠道菌群结构分析 .....	江昀 胡亚洲 向建国 潘望城(1332)
食物相铬在豹纹鳃棘鲈鱼不同脑区的生物累积 .....	李钰 郭志强 韩冬 韦露(1341)
铜绿微囊藻对萼花臂尾轮虫与大型溞竞争关系的影响 .....	
.....李海露 姚慧 何雨晗 耿红 徐军 何亮 张欢(1350)	
光强和温度变化对曲浒苔光合作用的调节机制 .....	查敏俊 周玲洁 蔡春尔 董傲 何培民(1357)
多环芳烃(萘)与聚苯乙烯微球联合对普通小球藻的急性毒性效应 .....	
.....张潇婧 李立杰 彭梦 柴毅 张辉 罗鸣钟(1364)	
五价砷胁迫处理对普通小球藻的急性毒性效应 .....	
.....李立杰 彭梦 杨帆 余佳妮 金巍 谭凤霞 柴毅(1374)	

### 生物多样性与资源

黄海中北部不同断面鱼卵、仔稚鱼群落结构特征 .....	杨艳艳 李焕军(1382)
瓯江口凤鲚生长、死亡和最适开捕体长 .....	
.....李霞芳 蒋日进 茵银 王雅丽 孙浩奇 印瑞 李凯 胡忠健(1393)	
冬季赤水河流域刚毛藻多样性调查及系统发育分析 .....	
.....赵志娟 杨小霞 钟俏君 陈冠海 彭相英 刘本文 朱欢 刘国祥(1402)	
基于SSU rDNA序列的网状车轮虫群体遗传结构及多样性研究 .....	许治祥 唐发辉 赵元莙(1412)
<b>综述</b>	
功能性氨基酸在水产甲壳类动物中的研究进展和应用前景 .....	程开敏 张震 李沛洋 郑石轩 李新宇(1420)

## 第 10 期

### 人工湿地

- 人工湿地微生物燃料电池耦合系统对典型全氟化合物的去除效果 .....嵇斌 赵亚乾 杨扬 郁义萍 黎绮文 卫婷(1429)  
E2-3S在水平流人工湿地中的降解与转化 .....付晶森 李睿 杨扬 张晓萌 陈善旭 陆慧琳 王雪丽 黄梦娜 王茜琰 戴玉女(1437)  
深型复合垂直流人工湿地对模拟污水处理厂尾水中PBDEs的去除研究 .....吴佩 高科技 刘涛 王亚芬(1447)  
人工湿地净化污水处理厂低浓度尾水的效果 .....李青 张琼华 周卫东 朱瑞亭 DZAKPASU Mawuli 熊家晴 王晓昌(1456)  
稻田湿地循环利用池塘养殖尾水效果 .....陶玲 彭格格 陈思媛 郝柳柳 代梨梨 彭亮 李谷(1466)  
以RAS固体废弃物为碳源的改进型人工湿地对养殖尾水的脱氮效果 .....曹涛涛 徐栋 白国梁 胡泽 陈迪松 吴振斌(1475)  
铜和磺胺甲噁唑复合污染下人工湿地对禽畜养殖尾水的处理效果 .....杨玲丽 马琳 刘伟 褚一凡 谭启洋 周巧红 吴振斌 贺锋(1484)  
基于水位调控的垂直流人工湿地强化脱氮研究 .....左尚武 王月圆 余少乐 李子辰 吴娟 成水平(1494)  
不同类型底栖动物对表面流人工湿地系统水质净化的影响 .....郭颖 谢慧君 张建(1501)  
水平潜流人工湿地堵塞初期微生物群落结构变化 .....张明珍 曹涛涛 刘伟 李前正 胡泽 陈迪松 吴振斌 徐栋(1510)  
两种生物电化学系统原位缓解人工湿地生物堵塞效果 .....李志伟 林莉莉 刘泳宏 张波 鲁汭 吴振斌 肖恩荣(1518)  
水库河口消落区水文条件改造及环境效应 .....苏广宇 许士国 李懿健 谢楚依(1527)  
基于协同发展的北方湿地公园生态修复技术研究——以琉璃河湿地公园为例 .....李咏红(1535)

### 长江十年禁渔

- 长江中下游干流大型底栖动物的分布模式 .....张梦娜 高文娟 张婷玉 赵永晶 吴兴华 李媛 王洪铸 崔永德(1546)  
长江口地区五种腹毛类纤毛虫的形态学研究 .....张子慧 祝晓璇 姜佳枚(1556)  
长江鲟幼鱼的听觉阈值研究 .....项杰 邹巧林 杜浩 王成友 危起伟(1563)  
禁捕初期鄱阳湖鱼类群落的结构特征 .....阳敏 盛漂 张燕萍 过龙根 王海华 高小平 陈宇顺(1569)  
长江禁捕后长江口刀鲚资源特征 .....马凤娇 杨彦平 方弟安 应聪萍 徐跑 刘凯 殷国俊(1580)

## 第 11 期

### 水生态与环境

- 果胶高载引起的黄颡鱼绿肝症和肝纤维化与肠道菌群失调的关联 .....姚仕彬 任胜杰 蔡春芳 曹霞敏 吴萍 叶元土 姜光明 丁惠明 张铖(1591)  
低氧胁迫和恢复对杂交黄颡鱼“黄优1号”肠道组织的影响 .....程景颢 李谣 沈铭浩 杨智茹 张伟健 张凯 王涛 张国松 尹绍武(1598)  
不同饵料对大口黑鲈生长性能和肠道微生物的影响 .....钟立强 王海骁 王明华 张世勇 姜虎成 陈校辉(1609)  
越冬饥饿胁迫对草鱼机体生化组成和糖脂蛋白代谢相关基因转录水平的影响 .....武文一 吉红(1618)  
环境铜离子对吉富罗非鱼生长性能、脂代谢、肝胰脏和脾脏组织的影响 .....颜子渊 邓真德 张竞 梁振业 徐畅(1631)  
环境相关四环素长期暴露对吉富罗非鱼生长性能、肝脏脂肪代谢和抗氧化反应的影响 .....刘光辉 徐一闯 魏晓雷 仲崇超 刘香元 罗智(1642)

### 渔业与生物技术

- TGF- $\beta$ /Smads信号通路介导脯氨酸促进浅色黄姑鱼鱼鳔胶原蛋白沉积 .....荣华 李德强 马敏伟 豆腾飞 史庆超 孔令富 毕保良 宁丽军(1649)  
烯醇化酶1多肽共价修饰改变细胞的生长和代谢模式 .....宋学文 李文玲 朱丽雯 PRITHIVIRAJ Nagarajan 王军 严继舟(1658)  
17 $\beta$ -雌二醇诱导斑点叉尾鮰雌性化研究 .....徐思琪 张世勇 段永强 张文平 王明华 边文冀 陈校辉(1668)  
鞍带石斑鱼精子诱导斜带石斑鱼雌核生殖 .....樊欣 张维炜 吴廷昌 文鑫 陈猛猛 吴光灿 骆剑(1675)

团头鲂 $foxO$ 基因家族的序列特征及表达分析	张阿鑫	陈 康	王伟峰	刘 红	王焕岭(1684)
三疣梭子蟹 $aqp2$ 基因克隆及其在蜕皮中的功能	吴 捷	吕建建	张伟伟	李玉坤	高保全 刘 萍(1694)
<b>生物多样性与资源</b>					
基于环境DNA宏条码和底拖网的珠江河口鱼类多样性	蒋佩文	李 敏	张 帅	陈作志	徐姗楠(1701)
周公河齐口裂腹鱼种群的遗传多样性和遗传结构	杨 鑫	黄 坤	胡清蕊	曾丽雯	杨世勇 武佳韵(1712)
基于宏基因组的保安湖浮游动物多样性研究					
.....	罗 帅	刘真诚	王 粟	谷思雨	王雪艳 姜传奇 鲍少攀 方 涛 缪 炜 熊 杰(1719)
保安湖菹草种群的时空分布特征及环境效应分析					
.....	刘孟梅	乔瑞婷	刘佳豪	余业鑫	张 苗 李 艳 王海军(1730)
AeDNA: 水生生物eDNA数据库	陈 凯	方成池	吴志刚	熊 凡	俞 丹 崔永德 张 琪 王宝强
姜传奇 宋立荣 王洪铸 刘焕章 陈晓飞 凌海波 蔡俊雄 李 涛 何舜平 缪 炜 熊 杰 曾宏辉(1741)					
稻田养殖铜锈环棱螺繁殖与仔螺生长特性	杨学芬	罗福广	黄 杰	王志强	苗国威 文衍红 杨瑞斌(1748)
<b>综述</b>					
温度对福寿螺生物学特性的影响及高低温适应机制研究进展					
.....	杨倩倩	李迦南	赵星星	蒲佳佳	乔东东 俞晓平(1754)

## 第 12 期

### 青藏高原水生态环境

西藏拉鲁湿地和茶巴朗湿地外来鱼类群落结构及变动趋势						
.....	朱 仁	隋晓云	孙欢欢	贾银涛	冯 秀	陈毅峰(1761)
雅鲁藏布江下游弧唇裂腹鱼的年龄结构与生长特性	王 健	张富斌	胡华明	巩 政	曹文宣	林鹏程(1770)
西藏湿地外来麦穗鱼生活史特征的适应性研究	孙欢欢	朱 仁	冯 秀	熊 文	隋晓云	陈毅峰(1780)
青海湖新生湖滨带与主湖区水环境特征差异研究						
.....	马凯丽	熊 雄	敖鸿毅	胡红娟	俞智鹏	赵邦明 马容真 吴辰熙(1788)
青藏高原天然湿地水环境特征和水质净化能力分析	刘 倩	赵 娥			王克焕	熊 雄 吴辰熙(1797)
青海湖主湖区与湖水淹没区的细菌群落结构差异分析						
.....	张 炜	周欣雅	马凯丽	李 华	虞功亮 敖鸿毅	霍 达(1807)
基于周从藻类的雅鲁藏布江流域水生态系统健康评价	王纤纤	刘乐乐	杨学芬	杨瑞斌		刘海平(1816)

### 水产动物疾病

甘草对大鲵抗嗜气单胞菌感染的作用	王文博	曹 娟	李春颖	孙盛雁	黄雨莹	刘屹楠 鲁义善(1832)
大口黑鲈 $\beta$ -防御素在杆状病毒系统中的表达及抑菌活性	管翠翠	邱 初		李洁琼	蒋长军	姚伦广(1838)
转录组揭示溶藻弧菌感染早期大黄鱼的免疫应答特征	程安怡	王永阳		翁华松	陈新华	张伟妮(1845)
草鱼 $\beta$ -防御素1的趋化活性及免疫佐剂效应研究	况 睿	周建成	刘小玲	苏建国	袁改玲(1855)	
草鱼IL-10单克隆抗体的制备与鉴定						
.....	刘 琴	贾 钊	陈康勇	朱晓真	王梓璇 陈 静	王俊亚 李耀国 肖调义 邹 钧(1867)
斑节对虾(非洲群体)肠道中哈维氏弧菌拮抗菌的筛选、鉴定及生理特性分析						
.....	刘吉丹	樊 英	刘洪军	唐学玺	王晓璐	王友红 叶海斌 盖春蕾(1876)
厚壳贻贝新型抗菌肽myticalin和mytimacin的分子鉴定						
.....	刘 璐	杨金月	阳宗欣	何建瑜	张晓林	何梦岚 严小军 廖 智(1888)

### 水生态与渔业

岩溶地下水补给河流沉积物理化性质及有机碳来源解析						
.....	余俊琪	白 冰	李光超	王德威	王 培	周巧红 吴振斌(1900)
光照与氮磷营养盐的协同作用对海带幼苗释放可溶性有机碳的影响						
.....	尼志杰	张永生	褚洪永	李 斌	张明亮	孙琰晴 胡顺鑫(1909)
绿藻栅藻对微囊藻的抑制效应及评价						
.....	宋婵媛	白 芳				李天丽 宋立荣(1916)
稻鱼共作对水稻产量效应的Meta分析	蔡淑芳	黄献光	黄惠珍	包 巍	张 钟	雷锦桂(1924)
基于微卫星标记的鼋亲子鉴定技术						
.....	谢敏敏	王亚坤	魏成清	陈 辰	刘晓莉 李 伟	洪孝友 朱新平(1932)
黄颡鱼XX伪雄鱼诱导与全雌种群规模化繁育	刘 娅	于 跃	鲁子怡	丁 洋	樊启学	沈志刚(1939)

# ACTA HYDROBIOLOGIC SINICA

Vol. 46, 2022

## CONTENTS

### No. 1

#### Ten-year Fishing Ban on the Yangtze River

10-year fishing ban is an important measure for the great protection of the Yangtze River .....	CAO Wen-Xuan	(1)
Fish diversity in Chongqing section of the national nature reserve for rare and endemic fish in the Upper Yangtze River based on eDNA technology .....	WANG Meng, YANG Xin, WANG Wei, DUAN Cong, LIU Zhi-Hao, CHEN Qi-Liang, LI Ying-Wen and SHEN Yan-Jun	(16)
Age and growth characteristics of <i>Coilia nasus</i> in the Three Gorges Reservoir Region .....	YANG Li-Ya, LÜ Hong-Jian, FU Mei, BAI Yun-Peng, SU Sheng-Qi and YAO Wei-Zhi	(28)
Age, growth, and mortality characteristics of <i>Pelteobagrus nitidus</i> (Sauvage et Dabry) in the Three Gorges Reservoir .....	LIAO Chuan-Song, LI Wei, YUAN Jing, YE Shao-Wen, ZHANG Tang-Lin and LIU Jia-Shou	(36)
Genetic diversity and population demography of <i>Coreius guichenoti</i> from the middle and lower reaches of the Jinsha River .....	HE Yong-Feng, ZHU Yong-Jiu, GONG Jin-Ling, ZHU Ting-Bing, WU Xing-Bing, LI Xue-Mei, MENG Zi-Hao and YANG De-Guo	(47)

#### Water Ecology and Environment

A long-term culture of gibel carp ( <i>Carassius auratus gibelio</i> VAR. CAS III) in net cages for 340 days: effects of dietary lipid on growth, digestive enzyme and lipid metabolism .....	FEI Shu-Zhan, WU Li-Yun, GUO Wei, LIU Hao-Kun, HAN Dong, JIN Jun-Yan, YANG Yun-Xia, ZHU Xiao-Ming and XIE Shou-Qi	(57)
Effects of dietary energy density and feed ration on growth and health in genetically improved farmed tilapia, <i>Oreochromis niloticus</i> .....	LIU Wei, JIANG Ming, WU Fan, TIAN Juan, LU Xing, YU Li-Juan and WEN Hua	(68)
The suitable starch types and levels in the diet of brown trout ( <i>Salmo trutta</i> ) juveniles .....	DANG Jiang-Yu, GAO Bo-Wei, XU Zhen, YANG Hang, LI Xiao-Qin and LENG Xiang-Jun	(78)
Effects of low-protein diet on growth performance, body composition, transaminase activity and antioxidant capacity of yellow catfish hybrid .....	YANG He-Shu, SUN Jun-Xiao, YANG Hui-Jun, FAN Qi-Xue and YUAN Yong-Chao	(87)
Effects of starvation stress on hemolymph physiology and intestinal health of <i>Procambarus clarkii</i> .....	LAI Ting, NIE Zi-Ying, ZHANG Xiao-Yu, SUN Cun-Xin, XU Xiao-Di, JIANG Qing, LIU Ming-Yang, LIU Bo and WANG Ai-Min	(97)

#### Fishery and Biotechnology

Molecular characterization, tissue distribution and transcriptional regulation of lysosomal acid lipase ( <i>LAL</i> ) in yellow catfish ( <i>Pelteobagrus fulvidraco</i> ) .....	CHEN Fang, ZHONG Chong-Chao, CHEN Shu-Wei, ZHANG Dian-Guang, LÜ Wu-Hong and TAN Xiao-Ying	(105)
The effect of hypoxia on heart and vascular morphological development and related genes expression in zebrafish embryos .....	JIANG Yu, YANG Ming-Yang, YE Qin, TAO Yi-Xi, XU Hao and LI Yun	(106)
Expression profiles and signal transduction of <i>traf6</i> in nile tilapia .....	HAN Xue-Qing, GAO Feng-Ying, LIU Zhi-Gang, CAO Jian-Meng, KE Xiao-Li, WANG Miao, YI Meng-Meng, GAO Yan-Xia and LU Mai-Xin	(116)
Preliminary studies on the mechanism of blood circulation distemperedness in gynogenetic haploid embryos of goldfish, <i>Carassius auratus</i> .....	ZHANG Qiong-Yu, TANG Jia-Hui, PENG Juan, TANG Peng-Cheng and SUN Yuan-Dong	(136)

#### Review

Applications of environmental DNA in lake biodiversity .....	XING Ying-Chun, GAO Wan-Ru, BAI Jie and ZHAO Ya-Hui	(148)
--	---	-------

### No. 2

#### Algae and Environment

Spatio-temporal pattern of odorous compounds and its influencing factors in the canal of the Midle-Route of South-to-North Water Diversion Project .....	WANG Yuan-Zhu,	(159)
--	----------------	-------

ZHANG Mei, BI Yong-Hong, ZHU Yu-Xuan, SONG Gao-Fei, WANG Shu-Lei, LIANG Jian-Kui and MI Wu-Juan	
Study on ecological restoration technology of macroalgae based on spore adhesion function .....	
..... BI Yuan-Xin, MIAO Hang, WANG Hui-Jie and YANG Qi-Fan	(167)
The inhibition of photosynthesis in <i>Heterosigma akashiwo</i> by dried macroalga <i>Ulva fasciata</i> powder .....	
..... YU Jiao-Jiao, LIU Hong, ZHANG Chao-Wen, ZHAO Jian-Gang and YE Chang-Peng	(175)
Health risk of neurotoxin $\beta$ -N-methylamino-L-alanine (BMAA) in freshwater aquaculture ponds and its control technology .....	
..... GU Xiao-Xiao, WU Xiang, ZHANG Ai, YU Cheng-Qiang, YANG Lin-Hao, SUN Yi and LI Zhen-Zhen	(183)
The role of abscisic acid and cold adaptation in improving the cryopreservation efficiency of <i>Pyropia haitanensis</i> conchocelis .....	
..... MA Ming-Jie, WEI Cai-Ling, ZHU Jun-Kai, LIU Qi-Qin, LUO Qi-Jun, CHEN Hai-Min and YANG Rui	(193)
Effects of diurnal temperature difference on growth and chlorophyll fluorescence of <i>Phaeodactylum tricornutum</i> and <i>Heterosigma akashiwo</i> .....	
..... LI Jian-An, WANG Jia-Yu, MEI Yi-Hui, CHEN Mei-Ling, ZHOU Cheng-Xu and LI Ya-He	(201)
Effects of nutrient deficiency on the partition pattern of EPS and glycogen in <i>Microcoleus vaginatus</i> .....	
..... GE Hong-Mei, ZHOU Ya-Ru, LIU Shi-Ying, WANG Xian-Zhe, HAN Xing-Ye, WANG Shu-Lian and HU Chun-Xiang	(209)
The allelopathy of <i>Bacillus amyloliquefaciens</i> on <i>Phaeodactylum tricornutum</i> .....	
..... REN Guo-Liang, DONG Zhi-Guo, LI De-Sheng, XIA Qing, LIU Jia-Ling, CUI Zhen-Quan and LIANG Xia-Fei	(215)
Allelopathic effects of <i>Prorocentrum donghaiense</i> on growth and photosynthesis of <i>Sargassum fusiformis</i> zygotes .....	
..... WANG Cai-Xia, JIA Yang, QIN Wen-Li, CHEN Bin-Bin, WANG Min and MA Zeng-Ling	(225)

## **Biotechnology and Resources**

Establishing the zebrafish model of foodborne-enteritis and imaging the involved immune cells' response .....	
..... LI Ming, XIE Jia-Yuan, ZHAO Xu-Yang, LI Xiao-Min, WANG Rui, SHAN Jun-Wei, CHENG Ying-Yin, ZHANG Wan-Ting, WU Nan and XIA Xiao-Qin	(237)
Sequencing and analysis of miRNAs of grass carp after GCRV chanllenge .....	
..... XIAO Tiao-Yi, LONG Zhe, LI Bin, ZHANG Qiu-Shi, QIN Ling and XIONG Shu-Ting	(247)
Identification of a new crustin and study of its antibacterial function from <i>Procambarus clarkii</i> .....	
..... JIAO Hou-Qi, HUO Shi-Tian, YAN Li-Ming, LI Yan-He and LIU Xue-Qin	(256)
Effects of different levels of Chinese herbal medicine on the growth performance, feed utilization and non-specific immunity of juvenile turbot ( <i>Scophthalmus maximus</i> L.) .....	
..... GAO Xue-Zheng, ZHANG Pei-Yu, SHI Xue-Ying, BEN Ling-Zhi, GUO Qing-Qing and LIU Hai-Yan	(264)
The spatial and temporal distribution in early life history stages of <i>Gymnocypris przewalskii</i> in Shaliu River .....	
..... TAN Long-Fei, XU Dong-Po, QI Hon-Fang, FANG Di-An, DING Long-Qiang, A Huai-Yun, LI Yuan-Dong, WU Yan-Hon and MAO Cheng-Cheng	(272)

## **No. 3**

## **Fishery and Biotechnology**

Bioinformatics and expression analysis of <i>plin2</i> in Chinese perch ( <i>Siniperca chuatsi</i> ) and its role in liver fat accumulation .....	
..... GAO Jun-Jie, LIANG Xu-Fang, CAI Wen-Jing and ZHUANG Wu-Yuan	(281)
Cloning and expression analysis of <i>tyr</i> and <i>slc24a5</i> in <i>Oryzias celebensis</i> .....	
..... MA Yuan, ZHONG Ying, GUO Jing and LI Ming-You	(291)
Identification of proximal cis-regulatory element for muscle highly expressed genes in zebrafish .....	
..... LU Cheng-Cheng, ZHAO Yi-Fan, FAN Chun-Xin and WANG Jian	(302)
Effects of <i>elovl8</i> deletion on survival and lipid metabolism under cold stress of zebrafish .....	
..... WANG Yu-Mei, SUN Shou-Xiang, HE Jia-Xin, YANG Gang and GAO Jian	(315)
The role of miR-139555 and its target gene <i>PtNBC</i> in <i>Portunus trituberculatus</i> in salinity stress .....	
..... ZHAO Xiao-Yan, LÜ Jian-Jian, ZHANG Wen, WU Jie, JIN Ling and LIU Ping	(323)
Cloning and functional analysis of <i>STING</i> in Chinese soft-shelled turtle ( <i>Pelodiscus sinensis</i> ) .....	
..... CHEN Ming, ZHOU Xie-Fei, GAO Jian-Jun, ZHU Ting-Yao, PENG Jia-Cheng and XU Hai-Sheng	(331)
Optimization of fish environmental DNA sample processing and preservation technology based on Droplet Digital PCR .....	
..... WANG Yue, LIU Huan-Zhang, LI Sha and YU Dan	(341)
Unmarked large fragment deletions in the genome of <i>Synechococcus elongatus</i> PCC 7942 based on homologous double-crossover recombination .....	
..... KE Zhu-Fang, XU Xu-Dong and GAO Hong	(347)

## **Biodiversity and Resources**

Population growth characteristics and stock assessment of <i>Paracanthobrama guichenoti</i> (Bleeker, 1864) in Kuilei Lake, Jiangsu Province, China .....	
..... CAI Xing-Wei, GUO Chao, LIAO Chuan-Song, LI Wei, FAN Hou-Rui and LIU Jia-Shou	(354)

Species identification and population genetic diversity of non-native apple snails (Ampullariidae: <i>Pomacea</i> ) in the West Lake .....	LI Jia-Nan, ZHAO Xing-Xing, WANG En, WANG Dao, QIAN Zhou-Xing, ZHANG Yang, YANG Qian-Qian and YU Xiao-Ping (363)
Genetic diversity of <i>Triplophysa yarkandensis</i> populations in Tarim River basin in Xinjiang .....	ZHAO Wen-Hao, YI Shao-Kui, SU Jun-Xiao, ZHOU Qiong, SHEN Jian-Zhong, LI Da-Peng and ZHOU Xiao-Yun (374)
Pattern of fish assemblage structure and diversity in Liujiang River .....	ZHU Shu-Li, CHEN Wei-Tao, LI Xin-Hui, LI Jie and LI Yue-Fei (384)
Genetic diversity analysis of mitochondrial D-loop region of <i>Anabarilius grahami</i> in Fuxian Lake .....	WU Jun-Jie, LI Gaung-Hua, JIN Fang-Peng, ZHAO Jing-Xia, LEI Chun-Yun, GAO Hai-Tao, FU Shi-Wei, ZHOU Rui, LUO Yong-Xin, XUE Shao-Wei, ZHANG Wen-Kui, LENG Yun, LIANG Yong-Ben, MA Chun-Ming and WANG Yan (394)

## Water Ecology and Environment

Effects of sustained high-temperature stress on growth performance, digestive enzyme activities and immune indexes of crayfish, <i>Procambarus clarkii</i> .....	HE Nai-Juan, RUAN Guo-Liang, LIU Yu-Lin, FANG Liu, WANG Qian, FU Yun-Yin, LI Sheng-Xuan and LI Qing-Song (402)
The role of upper trophic level predators in maintaining the pelagic and littoral habitat energy coupling in shallow lakes .....	XU Ying, ZHU Kong-Hao, GUO Yu-Lun, WANG Kang and WANG Tao (409)
Effects of different fertilization patterns on phytoplankton community structure in paddy fields with <i>Procambarus clarkii</i> .....	WANG Hai-Yan, MAO Wen-Jing, DONG Ze-Tao, YANG Jun and ZHU Jian-Qiang (418)
Study on the aluminium salts recovery and recycling during <i>Microcystis flos-aquae</i> removal using coagulation sedimentation .....	YU Tong-Bo, LI Li-Li, CHENG Shao-Zhe, ZHANG Hai-Yang and ZHANG Xue-Zhi (426)

## Review

Stable isotope mixing model evaluation: quantifying the quality of predictions .....	ZHU Kong-Hao, LI Bin, WANG Kang, GUO Yu-Lun, WANG Wei-Kang and XU Jun (438)
--	---

## No. 4

### Nutrition and Immunity

Polysaccharides syncytial element on immunity of grass carp under heat stress .....	LIU Hua, DENG Tao-Qiu, SHI Yin-Kui, YU Hui, YANG Ying, SHI Yi-Ru, CAI Ming-Hui and DUAN Yu-Wan (447)
Ammonia nitrogen and cadmium stress on antioxidant system and immune function of furong crucian carp ( <i>Cyprinus capio</i> furong. ♀ × <i>Carassius auratus</i> red var. ♂) .....	GAO Jin-Wei, WU Hao, LI Shao-Ming, XIE Min, LI Wen-Xiang and SONG Rui (456)
Effects of dietary <i>Scenedesmus ovalternus</i> on the disease resistance of overwintering gibel carp ( <i>Carassius gibelio</i> var. CAS V) .....	XU Wen-Jie, XIA Yu, ZHU Xiao-Ming, HAN Dong, LIU Hao-Kun, YANG Yun-Xia, XIE Shou-Qi, GAO Hong and JIN Jun-Yan (465)
Fermented soybean meal instead of fish meal on growth, lipid metabolism, serum non-specific immunity and intestinal flora of juvenile largemouth bass .....	HUANG He, TIAN Xin-Xin, HUANG Xu-Xiong, CHEN Nai-Song and ZHONG Guo-Fang (476)
Dietary threonine in low fish meal diet on antioxidant capacity, digestive physiology and intestinal inflammatory factor gene expression of triploid <i>Oncorhynchus mykiss</i> .....	WANG Ya-Ling, WANG Chang-An, LIU Hong-Bai, HAN Shi-Cheng, LU Shao-Xia and ZHANG Yin (487)
Effects of dietary alfalfa meal on the growth performance, muscle quality and serum antioxidant indexes of grass carp .....	TONG Fang-Le, TANG Tao, WEI Ze-Hong, HU Yi and LIU Shao-Jun (497)
Hypoxia-reoxygenation stress on antioxidant enzyme activity and expression of <i>Cu/Zn-SOD</i> and <i>Mn-SOD</i> genes in silver carp ( <i>Hopophthalmichthys molitrix</i> ) .....	ZHANG Mei-Dong, LING Chen, SHA Hang, CHEN Meng, WANG Dan, LUO Xiang-Zhong, ZOU Gui-Wei and LIANG Hong-Wei (506)
Periodical starvation-refeeding on growth performance, hepatic antioxidant indices, intestinal digestive enzyme activities of <i>Paramisgurnus dabryanus</i> .....	CAI Ming-Cheng, SUN Han-Chang, XIE Ming-Di, LI Chun-Hong-Tian, ZHAO Yin-Nian, FAN Wen-Qiao and YANG Fan (513)

### Aquatic Animal Disease

Lymphocytes and <i>BCL10</i> expression in grass carp ( <i>Ctenopharyngodon idella</i> ) after the infection of GCRV .....	JIANG Zhu-Xiang, GUO Zao-Zao, ZHENG Guo-Dong and ZOU Shu-Ming (520)
Molecular characteristics and antiviral effects of <i>ATG10</i> in large yellow croaker ( <i>Larimichthys crocea</i> ) .....	WEI Zu-Yun, LU Li-Xia, REN Qiu-Lei, HE Tian-Liang and CHEN Xin-Hua (528)

Pdcd6ip inhibited the replication of spring viraemia of carp virus .....	SHAO Ling, ZHANG Ming-Hui and PENG Jun-Hui (536)
Influence of sirna targeting CyHV-2 <i>ORF57</i> gene on replication of CyHV-2 in CSC cells .....	JIN Li-Ping, PAN Xiao-Yi, LIN
..... Ling-Yun, YAO Jia-Yun, CAO Zheng, YIN Wen-Lin, LAI Ying-Tiao, TAO Jia-Fa, LIU Yi-Han and SHEN Jin-Yu (544)	
Identification and phylogenetic analysis on <i>Myxobolus acinosus</i> Nie & Li, 1973, <i>Myxobolus pseudoacinosus</i> Guo, et al., 2018 and <i>Myxobolus toyamai</i> Kudo, 1917 .....	
..... TAN Lu-Qi, ZHOU Yang, WANG Miao-Miao, YANG Cheng-Zhong and ZHAO Yuan-Jun (554)	
Redescription and molecular phylogenetic analysis on <i>Myxobolus acutus</i> Wu and Chen, 1987 (Myxozoa: Myxobolidae) .....	SHI
Xiao-Wei, WANG Mao, CHEN Hong-Zhen, GAO Lei, LIU Xiao-Cong, YANG Cheng-Zhong and ZHAO Yuan-Jun (562)	
<b>Fishery and Biotechnology</b>	
miR-9 overexpression on transcriptome level in fertilized eggs of <i>Monopterus albus</i> .....	
..... XUE Ling-Zhan, YUAN Yin, BI Bao-Liang, KONG Ling-Fu, YAN Hui, LI Da-Peng and GAO Yu (573)	
Comparative 6mA methylome in three <i>Tetrahymena</i> species .....	
..... WANG Su, CHAI Xiao-Cui, ZHANG Jing, YANG Wen-Tao, YUAN Dong-Xia and XIONG Jie (583)	
Cloning of <i>Gs</i> gene in <i>Fenneropenaeus chinensis</i> and its functional analysis under acute low salt stress .....	
..... ZHOU Yu-Xin, HE Yu-Ying, LI Jian, WEI Wei, WANG Qiong and XIE Yong-Jun (591)	
Physiological effects of salt stress on large-fragment deletion mutants of <i>Synechococcus elongatus</i> PCC 7942 .....	
..... XU Yi and XU Xu-Dong (597)	

## Review

Metazoan parasites of antarctic fishes: a review on nematode, cestode and copepod .....	ZHU Guo-Ping and NING Jing (610)
---	----------------------------------

## No. 5

### Biodiversity and Resources

The spatial-temporal distribution of fish in lake using acoustic tagging and tracking method .....	
... SHI Lei, YE Shao-Wen, ZHU Hao, JI Xiang, WANG Jia-Cheng, LIU Chuan-Ang, LIU Jia-Shou and LIU Xing-Guo (620)	
Species diversity and zoogeographical analysis of freshwater fishes in central and southern mountainous area of East China .....	TANG Wen-Qiao, SONG Xiao-Jing and ZHANG Ya (629)
Functional diversities of fish community in Peng'an section of the middle reach of Jialing River .....	ZHANG Qian,
..... ZENG Yu, XIAO Jin, XIANG Ling-Li, BAO Jiang-Hui, ZHANG Chao-Shuo, MI Xiang-Yuan and DUAN Ming (642)	
Morphology, histological structure characteristics and digestive enzyme activities of the digestive tract of <i>Pampus argenteus</i> .....	TANG Dao-Jun, LIU Yang, ZHENG Xue-Bin, NI Jun-Jie,
..... HOU Cong-Cong, WANG Ya-Jun, XU Shang-Liang, ZHANG Chun-Dan, JIN Shan, XU Wan-Tu and ZHU Jun-Quan (653)	
Skeletal system analysis of Asian giant soft-shelled turtles and comparison with Chinese soft-shell turtle .....	
..... XIE Min-Min, HONG Xiao-You, LI Wei, LIU Xiao-Li, CHEN Chen and ZHU Xin-Ping (663)	

### Water Ecology and Environment

Various photoperiods on growth, energy budgets and gene expression of circadian clock in koi carp ( <i>Cyprinus carpio</i> ) .....	
..... SHI Dong-Jie, WANG Wen-Feng, LI Wen-Tong, WEI Dong, WANG Sai-Sai and JIANG Ju-Feng (670)	
Captive density on growth performance and health status of largemouth bass ( <i>Micropterus salmoides</i> ) .....	
..... ZHANG Qi, HOU Jie, YANG Jun, LIAO Wei-Jian, LU Jian-Chao and HE Xu-Gang (678)	
Dissolved oxygen level on the body kidney structure and antioxidant enzyme activities of Qinghai Lake scaleless carp, <i>Gymnocypris przewalskii</i> .....	CHEN Fu-Ju, ZHAO Yu-Tian, FU Sheng-Yun and LI Xue-Yuan (686)
Enrichment and oxidative stress characteristics of Cd <sup>2+</sup> in <i>Litopenaeus vannamei</i> in aqueous environment .....	
..... MEI Guang-Ming, ZHU Yu-Zhuang, YANG Ying-Yue, GU Jie, ZHANG Xiao-Jun and YANG Wen-Ge (698)	
Food web structure of the Bao'an Lake based on stable carbon and nitrogen isotopes analysis .....	
..... CHEN Jun-Yi, WANG Kang, GUO Yu-Lun, ZHU Kong-Hao, BA Ai-Rong, LIU Yun and ZHAO Kang-Shun (706)	
Characteristics and main influencing factors of plankton functional groups in summer and autumn of Changhu Lake .....	
..... GONG Sen-Sen, LI Xue-Mei, WU Jia-Wei, CHAI Yi, YANG De-Guo, TAN Feng-Xia and ZHU Ting-Bing (717)	

### Fishery and Biotechnology

The spatio temporal expression of embryo/larval hemoglobin gene in <i>Gymnocypris ecklonii</i> .....	WANG Fa-Yan,
..... LIU Dan, GAO Qiang, CHAO Yan, NIE Miao-Miao, YANG Chao-Jie, NI Wei-Lin, WANG Li-Han and QI De-Lin (724)	
Genetic monitoring of Changfeng silver carp base on microsatellite .....	
..... LUO Xiang-Zhong, QIN Wei-Min, LIANG Hong-Wei, SHA Hang and ZOU Gui-Wei (734)	

Preliminary study on gynogenesis of <i>Siniperca chuatsi</i> induced by hydrostatic pressure .....	LI Yong-Ming, GUI Bin, LI Yang-Yu, LI Yang-Yang, CHEN Liang-Ming, HUANG Rong, LIAO Lan-Jie and WANG Ya-Ping	(740)
Temperature on hermaphroditism and sex reversal in freshwater peal mussel, <i>Hyriopsis schlegelii</i> .....	XU Hong-Qin, MA Hui-Mei, ZENG Qi, HU Bei-Juan, SHENG Jun-Qing and HONG Yi-Jiang	(753)
Cloning and sequence analysis of <i>Styloynchia lemnae adss</i> gene and construction of expression vector .....	WANG Ying, FAN Jin-Feng, ZHANG Qing and CHEN Ying	(760)
The heterological expression and protein advanced structure model of the heme oxygenase gene <i>NS-HO1</i> in <i>Nostoc sphaeroides</i> .....	HUANG Hui, CHEN Li, WANG Hai-Yang, FANG Qing and CHENG Chao	(766)

## Review

Reconstruction of consumer dietary sources based on stable isotopes .....	WANG Kang, ZHU Kong-Hao, Guo Yu-Lun and XU Jun	(777)
---	--	-------

## No. 6

Environmental requirements of natural reproduction of <i>Gymnocypris przewalskii</i> under artificial simulated conditions .....	ZHOU Yang-Hao, RONG Yi-Feng, ZHOU Wei-Guo, LIU Huang-Xin, WANG Pu-Yuan, YU Lu-Xian, FU Sheng-Yun, YANG Jian-Xin, QI Hong-Fang and DU Hao	(787)
Interspecific differences in the personalities of two ecologically related prey fish and the effects of their predator .....	LI Qin-Lei, LIU Xiang, ZHANG Ning, XIA Jing-Yi, ZHENG Xue-Li and XIA Ji-Gang	(795)
Simulated predator risk on behavior, swimming ability and stress response of juvenile large yellow croaker ( <i>Larimichthys crocea</i> ) .....	WANG Li-Ping, ZHANG Dong, LIU Xin, LIN Ting-Ting, LIU Sheng-Yu, WANG Xiao-Shan and LI Si-Ping	(810)
Response of "burst and gliding" behavior to hydrodynamic conditions during upstreaming in the <i>Schizothorax prenanti</i> .....	LI Qin-Zhi, DENG Yue-Xi, TANG Xi-Liang, YAN Zhong-Luan, WANG Xiao-Ming, LU Jing-Ying, LI Jia and AN Rui-Dong	(819)
Individual variation of energy metabolism characteristics and ecological correlation in juvenile qingbo ( <i>Spinibarbus sinensis</i> ) .....	LUO Yu-Lian, PANG Xu, LIU Qian-Ying, ZHANG Yong-Fei, FU Cheng and FU Shi-Jian	(825)
Feeding and fasting on swimming performance and hypoxia tolerance of <i>Micropterus salmoides</i> .....	TAN Gan, SHI Han-Ying, CHEN Yong-Jun, LIN Shi-Mei, LI Yun and PANG Xu	(831)
Temperature selection and preference of juvenile <i>Eriocheir sinensis</i> .....	CHEN Yong-Jin, ZHOU Yan-Feng and XU Dong-Po	(837)
Personality on collective moving characteristics and food competitiveness ability of qingbo ( <i>Spinibarbus sinensis</i> ) .....	FU Xiang, FU Cheng, FAN Jie, XIAO Ling-Tao and FU Shi-Jian	(846)
Preliminary study on the selectivity, behavioral and physiological response of the sea cucumber <i>Apostichopus japonicus</i> to different habitats .....	JIANG Yu-Shan, SONG Ya-Cai, FANG Ling, LÜ Fei and ZHANG Pei-Dong	(855)
Thermal tolerances and collective behavior during water temperature rising in juvenile grass carp ( <i>Ctenopharyngodon idellus</i> ) .....	LI Wu-Xin, FU Shi-Jian, QIN Li-Ping and ZENG Ling-Qing	(864)
Prey species and size selection of <i>Odontobutis potamophila</i> .....	REN Yan, MA Qin, LIU Yi-Ran, XIE De-Bing, HU Shao-Di, WANG Hui, SHI Yang-Bai, LI Bo and ZHU Si-Hua	(871)
The relationships between personality and maintenance metabolism, food intake rate and daily energy expenditure in <i>Zacco platypus</i> .....	HU Yue, TANG Jin-Yu, FU Cheng and FU Shi-Jian	(879)
Learning and memory pathway inhibitors t-5224 and kn-62 on the expression of <i>c-fos</i> and taste receptor <i>tIr1</i> in <i>Siniperca chuatsi</i> .....	XIAO Qian-Qian, LIANG Xu-Fang, ZHUANG Wu-Yuan and CAI Wen-Jing	(887)
Preference for substrate in different developmental stages of <i>Eriocheir sinensis</i> .....	LI Chun-Bo, HUANG Xiao-Rong, FENG Guang-Peng, ZHUANG Ping, GENG Zhi and WU Ye-Ling	(895)
The maternal effect of anti-predator behavioural and morphological responses to <i>Asplanchna</i> in <i>Brachionus calyciflorus</i> .....	HE Yu-Han, ZHANG Huan, ZHU Kong-Hao, ZHAO Kang-Shun, LI Hai-Lu and XU Jun	(902)
Behavior response of zebrafish ( <i>Danio rerio</i> ) under ammonia nitrogen stress based on online biomonitoring system .....	HE Ya-Qi and REN Zong-Ming	(912)
Feeding state classification of grass carp based on optical flow and improved RNN .....	LIU Shi-Jing, TU Xue-Ying, QIAN Cheng, ZHOU Jie and CHEN Jun	(921)

## Review

Animal personalities and behavioral syndromes: Conception, Measurements and Analysis .....	LI Si-Ping, ZHANG Dong and DUAN Ming	(932)
--	--------------------------------------	-------

## No. 7

### Biodiversity and Resources

Genetic diversity of mitochondrial <i>CO I</i> gene in populations of black carp from the Yangtze River and Pearl River .....	BAO Sheng-Cheng, BAO Tian-Jie, WANG Shen-Tong, XU Xiao-Yan, DAI Ya-Fan, ZHANG Jia-Hua, LI Jia-Le and SHEN Yu-Bang	(938)
Genetic structure and phylogenetic relationship of rice field carp ( <i>Cyprinus carpio</i> Linnaeus) in Congjiang and surrounding areas .....	YU Ke, MA Zhi-Fang, AN Miao, LUO Jun, HUANG Sheng, LIANG Zhi-Qiang, SHAO Jian, PAN Qiu-Zhi, REN Fang and LONG Jin-Mei	(950)

Feeding ecology and food competition of three demersal fish species in the coastal waters of Shandong Province .....	
HAN Fang-Cheng, LI Fan, FENG Yuan, LIU Li-Jun, NIU Chun-Xiang, XU Ye-Peng, REN Yi-Ping and XUE Ying (962)	
Spatiotemporal distribution of eggs and larvae of <i>Coilia mystus</i> and its relationship with environmental factors along Oujiang Estuary .....	
SUN Hao-Qi, JIANG Ri-Jin, CHEN Feng, RUI Yin, LI Xia-Fang, LI Zhen-Hua, YIN Rui and ZHOU Yong-Dong (973)	
Morphological identification and genetic diversity analysis of duckweeds in Guizhou Province .....	
..... FENG Dan, TAN Ai-Juan, LÜ Shi-Ming, ZHENG Meng-Meng and YANG Gui-Li (982)	

## Water Ecology and Environment

Benefits evaluation of lotus-fish integrated system in Jinggangshan area .....	MI Xiang-Yuan, ZHANG Chao-Shuo, ZHANG Xiao-Juan, WANG Hai-Hua, GUO Xiao-Ze, LI Si-Ming, ZHAO Da-Xian, HONG Yi-Jiang and DUAN Ming (994)
Contents and risk assessment of heavy metals in surface water in the main canal of middle route of the South-to-North Water Diversion Project .....	GUO Yong-Yong, HUA Jiang-Huan, ZHU Yu-Xuan, SONG Gao-Fei, LI Rui-Wen, HAN Jian, YANG Li-Hua and ZHOU Bing-Sheng (1006)
Correlation between the density of cultured <i>Sebastiscus marmoratus</i> and its environmental DNA .....	..... GAO Tian-Xiang, CHEN Zhi, WANG Xiao-Yan, ZHANG Hao-Bo and SHI Hui-Lai(1015)
Fillet quality difference of triploid rainbow trout ( <i>Oncorhynchus mykiss</i> ) cultured under different modes .....	..... GUAN Ling-Ling, LIU Xiao-Hong, TIAN Hai-Ning, LI Jian-Rong, MENG Yu-Qiong and MA Rui(1028)
Water pH on growth, nutrient composition and fillet quality of nile tilapia ( <i>Oreochromis niloticus</i> ) .....	..... GU Ting-Ting, LÜ Hong-Bo, WANG Yue, DU Zhen-Yu and QIAO Fang(1037)
Toxic effects of dihydroartemisinin on <i>Tetrahymena thermophila</i> .....	..... PAN Hou-Jun, DENG Mei-Ling, GU Xin-Ting, ZHENG Qiao-Yin and LIU Yu-Guo(1044)

## Physiology and Ecology of Aquatic Plants

Interactive effects of elevated $\text{CO}_2$ and phosphorus on the growth and photosynthesis in <i>Nostoc sphaeroides</i> .....	..... GUO Hong-Yong, ZHU Jun-Jie, SHEN Yi-Jie, WANG Xi, JIN Peng and XIA Jian-Rong(1051)
Analysis of 1, 3-dioleoyl-2-palmitoylglycerol of <i>Chlamydomonas reinhardtii</i> by ultra-high performance liquid chromatography-tandem quadrupole mass spectrometry .....	..... LU Yuan-Chen, LI Yan-Hua, YU Li-Hua, HAN Dan-Xiang and MA Hai-Yan(1059)
Establishment and optimization of continuous culture system and application in the competition between toxic and non-toxic <i>Microcystis</i> .....	ZUO Jun, ZENG Jia-Ying, YANG Si-Yu, SONG Li-Rong and GAN Nan-Qin(1069)
Spatial-temporal distribution of phytoplankton in waihai of Dianchi Lake and its nonlinear correlation analysis with environmental factors .....	SHI Feng-Ning, YANG Hui, LIU Xiang-Wei, WANG Yu-Chun, SU Yu-Ming, HU Ming-Ming, BAO Yu-Fei, LI Shan-Ze and WEN Jie(1079)
Nano-Cu ( $\text{OH}$ ) <sub>2</sub> exposure on lettuce growth in hydroponic culture .....	..... DING Run-Run, TONG Ling, ZHANG Yi-Ge, GAO Lu-Lu, SHI Hong-Fei, ZHANG Wei-Cheng and FANG Tao(1087)
Clonal growth characteristics of six submerged macrophytes .....	..... YAO Yi-Qian, YUAN Chang-Bo, LÜ Chao-Chao, CAO Te, ZHANG Xiao-Lin and NI Le-Yi(1096)
Optimizing the nutritional conditions of duckweed rapid asexual propagation based on artificial culture .....	..... GAO Xiao-Yu, CAO Te, NI Le-Yi, ZHANG Xiao-Lin and CHOU Qing-Chuan(1104)

## No. 8

## Fishery and Biotechnology

Role of <i>Trematomus bernacchii</i> <i>dusp1</i> gene in cell cold resistance .....	..... WANG Ying, HU Ling-Hong, WANG Hua-Min and CHEN Liang-Biao(1112)
Molecular cloning of <i>TRPV1</i> in <i>Spinibarbus sinensis</i> and the responses to stimulation of hot temperature and LPS .....	..... LIU Yao-Hui, XIE Yun-Long, ZHANG Zi-Heng, YANG Xing-Yue, LU Min-Fang, PU De-Yong, WANG Zhi-Jian, ZHANG Yao-Guang and LIU Xiao-Hong(1119)
Construction of a single nucleotide polymorphism genotyping system for salmonid species based on microfluidic chip .....	ZHAO Zi-Xia, XU Jian, WU Bi-Yin, CAO Ding-Chen, BAI Qing-Li, XU Peng and MA Zhuo-Jun(1129)
Whole-genome sequencing and phosphorus uptake and transport pathway comparative analysis of <i>Cylindrospermopsis raciborskii</i> N8 .....	..... CHEN Zhi-Jiang, RUAN Zi-Xi, CHENG Nan, XIAO Li-Juan, PENG Liang, HAN Bo-Ping and LEI La-Mei(1141)
The clone of <i>FoxO1</i> gene and its spatiotemporal expression in gonadal complex of newly hatched <i>Alligator sinensis</i> .....	WEN Yue, HU Cheng-Cheng, WANG Ren-Ping, XIA Yong, XIA Tong-Sheng, HE Ming-Yue, ZHOU Yong-Kang, ZHANG Tong-Xin, ZHANG Jun, PANG Yu, WANG Hao, SHEN Xin-Yu, NIE Hai-Tao and WU Xiao-Bing(1149)
Screening of transcriptome SSR marker of <i>Macrobrachium rosenbergii</i> and analysis of its correlation with body weight .....	CHEN Xue-Feng, WANG Chun-Lin, LI Rong-Hua, GU Zhi-Min, XU Bin-Peng, CHENG Hai-Hua and PENG Fei(1159)

Cloning of cDNA of <i>Bcl-2</i> gene of <i>Marsupenaeus japonicus</i> and its role in cold resistance .....	SHAO Hui-Xin, REN Xian-Yun, YU Zhen-Xing, LI Jian and LIU Ping(1167)
Molecular cloning of <i>McCaspase 3-4</i> and its functions in <i>Mytilus coruscus</i> larval metamorphosis .....	LIU Zhi-Xian, LI Jia-Zheng, LIANG Lin-Li, FENG Dan-Dan, LIANG Xiao, YANG Jin-Long and ZHU You-Ting(1176)

## Water Ecology and Environment

Effects of sodium cholate on growth and glucose metabolism of largemouth bass ( <i>Micropterus salmoides</i> ) .....	DING Fei-Fei, ZHOU Nan-Nan, ZHANG Le, QIAO Fang, DU Zhen-Yu and ZHANG Mei-Ling(1186)
Apparent digestibility of six new non-grain protein ingredients for largemouth bass ( <i>Micropterus salmoides</i> ) .....	SHI Yu-Hui, ZHU Shu-Jie, TAN Bei-Ping, ZHANG Wen-Bing, ZHOU Xiao-Qiu, GAO Wei-Hua and CHI Shu-Yan(1196)
Different effects of various dietary starches on the growth and metabolism of rainbow trout juveniles .....	DANG Jiang-Yu, CAI You-Wang, ZHANG Chun-Yan, CAO Kai-Lin, LI Xiao-Qin and LENG Xiang-Jun(1204)
Requirement level of dietary protein for <i>Monopterus albus</i> .....	JIANG Wen-Hao, YANG Xin, ZHOU Qiu-Bai, WANG Zi-Rui, GAO Miao, WANG Ying, HU Zhong-Hua and ZHANG Wen-Ping(1214)
Optimal level of fish oil supplementation in diet of juvenile American eels ( <i>Anguilla rostrata</i> ) .....	QU Qian, ZHAO Pan-Yue, CAI Guo-He and ZHAI Shao-Wei(1222)
Effects of overwintering on antioxidant capacity and fatty acid composition in grass carp ( <i>Ctenopharyngodon idellus</i> ) .....	WU Wen-Yi and JI Hong(1235)
Antioxidant and non-specific immune responses of four species of fish larvae under ammonia stress .....	WU Xue-Yang, GUO Hong-Hui, KUANG Yu, ZHANG Ce, YANG Hui, TANG Rong, ZHANG Xi, LI Da-Peng and LI Li(1248)
Effects of hypoxia stress and <i>Spiroplasma eriocheiris</i> infection on the survival and apoptosis of <i>Eriocheir sinensis</i> .....	WANG Ya-Qin, HUANG Chen, GENG Chao, MIAO Yan-Yang, LU Yin-Yue, GU Wei, WANG Wen and MENG Qing-Guo(1255)
Transcriptome analysis of two different morphological populations of <i>Scylla paramamosain</i> under cold stress .....	CHEN Jie, DONG Meng, CUI Yue, FANG Cui-Lian, CHEN Xu-Tang and LIU Zi-Ming(1264)

## Review

The characteristics, development and application of the bioactive product squalene .....	CHENG Peng-Fei, WANG Hai-Xia, BO Ya-Hui, ZHOU Cheng-Xu and YAN Xiao-Jun(1276)
--	---

## No. 9

## Fishery and Biotechnology

Androgen receptor deficiency causes ovarian dysgenesis via reducing the hepatic vitellogenin production in zebrafish .....	LI Tian-Hui, ZHAI Gang, HE Jiang-Yan, LOU Qi-Yong, JIN Xia, DU Zhen-Yu, XIAO Wu-Han and YIN Zhan(1284)
Protein expression of Rab5 and Rab6 in <i>Procambarus clarkii</i> and antibody preparation on phagocytic activity of haemocytes .....	ZHU Lei, ZHAO Tong, WANG Xin-Ru, JIANG Xin-Yu, HOU Li-Bo and KONG Xiang-Hui(1292)
Production and application of monoclonal antibodies against VP7 capsid protein of grass carp reovirus .....	JI Ning, WEI Wei, GUO Jia-Hong, WANG Jun-Ya, LI Yao-Guo, XIAO Tiao-Yi and ZOU Jun(1300)
Purification of N-acetyl- $\beta$ -D-glucosaminidase from intestine of <i>Anguilla japonica</i> and its enzymatic characteristics .....	LIN Jian-Cheng, HU Jian-Hui and WU Qin-Duan(1309)
Cloning, bioinformatics and induced expression analysis of <i>dxs</i> gene in <i>Phaeodactylum tricornutum</i> .....	SHU Ming-Yu, GONG Yi-Fu, LÜ Xin-Meng, JIA Ze-Ming, WANG Bo, LIU Xuan-Xuan and WANG He-Yu(1318)
Prokaryotic expression, purification and polyclonal antibody preparation of <i>Chlamydomonas reinhardtii</i> BBS8 .....	LI Wen-Juan, JIA Hang, XUE Bin and FAN Zhen-Chuan(1324)

## Water Ecology and Environment

Characteristics of microplastics in different culture stages of typical crab ponds .....	XIE Shen-Hao, XIONG Xiong, HU Hong-Juan and WU Chen-Xi(1331)
Analysis of intestinal microbiota structure in different health conditions of <i>Paa spinosa</i> .....	JIANG Yun, HU Ya-Zhou, XIANG Jian-Guo and PAN Wang-Cheng(1340)
Bioaccumulation of chromium in different brain regions of <i>Plectropomus leopardus</i> during dietary exposure .....	LI Yu, GUO Zhi-Qiang, HAN Dong and WEI Lu(1349)
Effect of <i>Microcystis aeruginosa</i> on competition between <i>Brachionus calyciflorus</i> and <i>Daphnia magna</i> .....	LI Hai-Lu, YAO Hui, HE Yu-Han, GENG Hong, XU Jun, HE Liang and ZHANG Huan(1356)
Adjustment mechanism of light intensity and temperature on photosynthesis of <i>Ulva flexuosa</i> .....	ZHA Min-Jun, ZHOU Ling-Jie, CAI Chun-Er, DONG Ao and HE Pei-Min(1363)
Acute toxic effects of polycyclic aromatic hydrocarbons (naphthalene) combined with polystyrene microspheres on <i>Chlorella vulgaris</i> .....	ZHANG Xiao-Qun, LI Li-Jie, PENG Meng, CHAI Yi, ZHANG Hui and LUO Ming-Zhong(1373)

Acute toxic effect of arsenates on <i>Chlorella vulgaris</i> .....	LI Li-Jie, PENG Meng, YANG Fan, YU Jia-Ni, JIN Wei, TAN Feng-Xia and CHAI Yi(1381)
--	--

## Biodiversity and Resources

Community structure of ichthyoplankton in the sections of the central and north Yellow Sea .....	YANG Yan-Yan and LI Huan-Jun(1392)
Growth, mortailty and optimum catchable size of <i>Coilia mystus</i> in Oujiang River Estuary .....	LI Xia-Fang, JIANG Ri-Jin, RUI Yin, WANG Ya-Li, SUN Hao-Qi, YIN Rui, LI Kai and HU Zhong-Jian(1401)
Diversity investigation and phylogenetic analysis of cladophora in Chishui River basin in winter .....	ZHAO Zhi-Juan, YANG Xiao-Xia, ZHONG Qiao-Jun, CHEN Guan-Hai, PENG Xiang-Ying, LIU Ben-Wen, ZHU Huan and LIU Guo-Xiang(1410)
Genetic structure and diversity of <i>Trichodina reticulata</i> Hirschman & Partsch, 1955 populations based on SSU rDNA sequence .....	XU Zhi-Xiang, TANG Fa-Hui and ZHAO Yuan-Jun(1419)

## Review

The role of functional amino acids in aquatic crustaceans .....	CHENG Kai-Min, ZHANG Zhen, LI Pei-Yang, ZHENG Shi-Xuan and LI Xin-Yu(1428)
---	--

## No. 10

### Constructed Wetland

Removal of typical perfluoroalkyl substances by microbial fuel cell coupling constructed wetland system .....	JI Bin, ZHAO Ya-Qian, YANG Yang, TAI Yi-Ping, LI Qi-Wen and WEI Ting(1436)
Degradation and transformation of E2-3S in horizontal flow constructed wetland .....	FU Jing-Miao, LI Rui, YANG Yang, ZHANG Xiao-Meng, CHEN Shan-Xu, LU Hui-Lin, WANG Xue-Li, HUANG Meng-Na, WANG Xi-Yan and DAI Yu-Nü(1446)
Removal of pbdes from simulated effluent of wastewater treatment plant by deep integrated vertical flow constructed wetland .....	WU Pei, GAO Ke-Ji, LIU Tao and WANG Ya-Fen(1455)
Performance of constructed wetland for low concentration effluent purification from sewage treatment plant .....	LI Qing, ZHANG Qiong-Hua, ZHOU Wei-Dong, ZHU Rui-Ting, DZAKPASU Mawuli, XIONG Jia-Qing and WANG Xiao-Chang(1465)
Effect of recycling fishpond wastewater in paddy wetland .....	TAO Ling, PENG Ge-Ge, CHEN Si-Yuan, HAO Liu-Liu, DAI Li-Li, PENG Liang and LI Gu(1474)
Nitrogen removal effect of aquaculture water through improved constructed wetland using recirculating aquaculture system solid waste as carbon source .....	CAO Tao-Tao, XU Dong, BAI Guo-Liang, HU Ze, CHEN Di-Song and WU Zhen-Bin(1483)
Purification performance of rural livestock and poultry breeding tail water by constructed wetland under Cu and SMZ combined pollution .....	YANG Ling-Li, MA Lin, LIU Wei, CHU Yi-Fan, TAN Qi-Yang, ZHOU Qiao-Hong, WU Zhen-Bin and HE Feng(1493)
Enhanced nitrogen removal over saturated water level regime in vertical flow constructed wetland .....	ZUO Shang-Wu, WANG Yue-Yuan, YU Shao-Le, LI Zi-Chen, WU Juan and CHENG Shui-Ping(1500)
Effects of different benthic fauna on water purification in surface flow constructed wetland system .....	GUO Ying, XIE Hui-Jun and ZHANG Jian(1509)
Microbial community structure during the initial clogging stage in horizontal subsurface flow constructed wetlands .....	ZHANG Ming-Zhen, CAO Tao-Tao, LIU Wei, LI Qian-Zheng, HU Ze, CHEN Di-Song, WU Zhen-Bin and XU Dong(1517)
Exploring the <i>in-situ</i> mitigation of bio-clogging of constructed wetlands by two bio-electrochemical systems .....	LI Zhi-Wei, LIN Li-Li, LIU Yong-Hong, ZHANG Bo, LU Rui, WU Zhen-Bin and XIAO En-Rong(1526)
Hydrological imrovement and environmental effect of transforming hydrological elements of the estuarine fluctuation zone .....	SU Guang-Yu, XU Shi-Guo, LI Yi-Jian and XIE Chu-Yi(1534)
Ecological restoration technology of the northern wetland park, take the Liuli River Wetland Park as an example .....	LI Yong-Hong(1545)

### Ten-year Fishing Ban on the Yangtze River

Distribution patterns of macrozoobenthos in the mid-lower mainstem of the Yangtze River .....	ZHANG Meng-Na, GAO Wen-Juan, ZHANG Ting-Yu, ZHAO Yong-Jing, WU Xing-Hua, LI Yuan, WANG Hong-Zhu and CUI Yong-De(1555)
Morphology of five hypotrichous ciliates from Yangtze Estuary area .....	ZHANG Zi-Hui, ZHU Xiao-Xuan and JIANG Jia-Mei(1560)

Threshold of the juvenile <i>Acipenser dabryanus</i> Dumeril .....	..... XIANG Jie, ZOU Qiao-Lin, DU Hao, WANG Cheng-You and WEI Qi-Wei(1568)
Characteristics of fish assemblages of Poyang Lake at the initial stage of the fishing ban .....	..... YANG Min, SHENG Piao, ZHANG Yan-Ping, GUO Long-Gen, WANG Hai-Hua, GAO Xiao-Ping and CHEN Yu-Shun(1579)
Characteristics of <i>Coilia nasus</i> resources after fishing ban in the Yangtze River .....	..... MA Feng-Jiao, YANG Yan-Ping, FANG Di-An, YING Cong-Ping, XU Pao, LIU Kai and YIN Guo-Jun(1590)

## No. 11

### Water Ecology and Environment

Green liver symptom and liver fibrosis caused by pectin overload in <i>Pelteobagrus fulvidraco</i> may be related to the intestinal dysbacteriosis .....	..... YAO Shi-Bin, REN Sheng-Jie, CAI Chun-Fang, CAO Xia-Min, WU Ping, YE Yuan-Tu, JIANG Guang-Ming, DING Hui-Ming and ZHANG Cheng(1597)
Hypoxia stress and recovery on intestinal tissue of hybrid yellow catfish "Huangyou-1" ( <i>Pelteobagrus vachelli</i> ♂ × <i>Pelteobagrus fulvidraco</i> ♀) .....	..... CHENG Jing-Hao, LI Yao, SHEN Ming-Hao, YANG Zhi-Ru, ZHANG Wei-Jian, ZHANG Kai, WANG Tao, ZHANG Guo-Song and YIN Shao-Wu(1608)
Different diets on growth performance and intestinal bacterial community of largemouth bass ( <i>Micropterus salmoides</i> ) .....	..... ZHONG Li-Qiang, WANG Hai-Xiao, WANG Ming-Hua, ZHANG Shi-Yong, JIANG Hu-Cheng and CHEN Xiao-Hui(1617)
Overwinter starvation on biochemical composition and transcriptional level of glucose-lipid-protein metabolism related genes transcription level in grass carp ( <i>Ctenopharyngodon idellus</i> ) .....	..... WU Wen-Yi and JI Hong(1630)
Environmental copper on growth performance, lipid metabolism, hepatopancreas and spleen histology of gift tilapia ( <i>Oreochromis niloticus</i> ) .....	..... YAN Zi-Yuan, DENG Zhen-De, ZHANG Jing, LIANG Zhen-Ye and XU Chang(1639)
Long-term environmental-related tetracycline exposure on growth performance, hepatic lipid metabolism and antioxidant responses in gift tilapia ( <i>Oreochromis niloticus</i> ) .....	..... LIU Guang-Hui, XU Yi-Chuang, WEI Xiao-Lei, ZHONG Chong-Chao, LIU Xiang-Yuan and LUO Zhi(1648)

### Fishery and Biotechnology

TGF-β/Smads signaling pathway regulates Pro to promote collagen deposition in the swim bladder of Chu's croaker ( <i>Nibea coibor</i> ) .....	..... RONG Hua, LI De-Qiang, MA Min-Wei, DOU Teng-Fei, SHI Qing-Chao, KONG Ling-Fu, BI Bao-Liang and NING Li-Jun(1657)
Covalent modifications of Enolase 1 polypeptide change cell growth and metabolism profile .....	..... SONG Xue-Wen, LI Wen-Ling, ZHU Li-Wen, PRITHIVIRAJ Nagarajan, WANG Jun and YAN Ji-Zhou(1667)
Feminization of channel catfish induced by 17β-estradiol .....	..... XU Si-Qi, ZHANG Shi-Yong, DUAN Yong-Qiang, ZHANG Wen-Ping, WANG Ming-Hua, BIAN Wen-Ji and CHEN Xiao-Hui(1674)
Introduction of diploid gynogenesis in orange-spot grouper <i>Epinephelus coioides</i> by giant grouper <i>Epinephelus lanceolatus</i> sperm .....	..... FAN Xin, ZHANG Wei-Wei, WU Ting-Chang, WEN Xin, CHEN Meng-Meng, WU Guang-Can and LUO Jian(1683)
Sequence characterization and expression analysis of the <i>foxO</i> gene family in <i>Megalobrama amblycephala</i> .....	..... ZHANG A-Xin, CHEN Kang, WANG Wei-Feng, LIU Hong and WANG Huan-Ling(1693)
Cloning of <i>aqp2</i> gene of <i>Portunus trituberculatus</i> and its function in molting .....	..... WU Jie, LÜ Jian-Jian, ZHANG Wei-Wei, LI Yu-Kun, GAO Bao-Quan and LIU Ping(1700)

### Biodiversity and Resources

Investigating the fish diversity in Pearl River Estuary based on environmental DNA matebarcoding and bottom trawling .....	..... JIANG Pei-Wen, LI Min, ZHANG Shuai, CHEN Zuo-Zhi and XU Shan-Nan(1711)
Preliminary study on genetic diversity and population structure of <i>Schizothorax prenanti</i> from Zhougong River .....	..... YANG Xin, HUANG Kun, HU Jing-Rui, ZENG Li-Wen, YANG Shi-Yong and WU Jia-Yun(1718)
Zooplankton diversity in Bao'an Lake based on metagenomic approach .....	..... LUO Shuai, LIU Zhen-Cheng, WANG Su, GU Si-Yu, WANG Xue-Yan, JIANG Chuan-Qi, BAO Shao-Pan, FANG Tao, MIAO Wei and XIONG Jie(1729)
Spatial and temporal distribution and environmental effects of <i>Potamogeton crispus</i> population in Bao'an Lake .....	..... LIU Meng-Mei, QIAO Rui-Ting, LIU Jia-Hao, YU Ye-Xin, ZHANG Miao, LI Yan and WANG Hai-Jun(1739)
AeDNA: aquatic environmental DNA database .....	..... CHEN Kai, FANG Cheng-Chi, WU Zhi-Gang, XIONG Fan, YU Dan, CUI Yong-De, ZHANG Qi, WANG Bao-Qiang, JIANG Chuan-Qi, SONG Li-Rong, WANG Hong-Zhu, LIU Huan-Zhang, CHEN Xiao-Fei, LING Hai-Bo, CAI Jun-Xiong, LI Tao, HE Shun-Ping, MIAO Wei, XIONG Jie and ZENG Hong-Hui (1747)
The reproduction and growth pattern of larvae of <i>Bellamya aeruginosa</i> cultured in rice field .....	..... YANG Xue-Fen, LUO Fu-Guang, HUANG Jie, WANG Zhi-Qiang, MIAO Guo-Wei, WEN Yan-Hong and YANG Rui-Bin(1753)

## Review

- Temperature on biological characteristics and adaptive mechanisms of the apple snails .....  
..... YANG Qian-Qian, LI Jia-Nan, ZHAO Xing-Xing, PU Jia-Jia, QIAO Dong-Dong and YU Xiao-Ping (1760)

## No. 12

### Water Ecological Environment of the Qinghai-Tibet Plateau

- Community structure and its changes of non-native fish from lhalu weland and chabalang wetland in Tibet Autonomous Region ..... ZHU Ren, SUI Xiao-Yun, SUN Huan-Huan, JIA Yin-Tao, FENG Xiu and CHEN Yi-Feng (1769)  
Characteristics of age and growth of *Schizothorax curvifilabiatus* in the lower reaches of the Yarlung Zangbo River .....  
..... WANG Jian, ZHANG Fu-Bin, HU Hua-Ming, GONG Zheng, CAO Wen-Xuan and LIN Peng-Cheng (1779)  
Adaptation in life-history traits of exotic topmouth gudgeon from wetlands in Tibet Autonomous Region .....  
..... SUN Huan-Huan, ZHU Ren, FENG Xiu, XIONG Wen, SUI Xiao-Yun and CHEN Yi-Feng (1787)  
Differences in water environment characteristics between the newly lakeshore zone and the main lake area of Qinghai Lake ..... MA Kai-Li,  
XIONG Xiong, AO Hong-Yi, HU Hong-Juan, YU Zhi-Peng, ZHAO Bang-Ming, MA Rong-Zhen and WU Chen-Xi (1795)  
Water environment characteristics and water purification capacity of natural wetlands in the Qinghai-Tibet Plateau .....  
..... LIU Qian, ZHAO E, WANG Ke-Huan, XIONG Xiong and WU Chen-Xi (1806)  
The difference in bacterial community structure between the main stream area and the lake inundation area of Qinghai Lake ..... ZHANG Wei, ZHOU Xin-Ya, MA Kai-Li, LI Hua, YU Gong-Liang, AO Hong-Yi and HUO Da (1815)  
Using periphyton algae to assess stream conditions of Yarlung Zangbo River Basin .....  
..... WANG Xian-Xian, LIU Le-Le, YANG Xue-Fen, YANG Rui-Bin and LIU Hai-Ping (1831)

### Aquatic Animal Disease

- Glycyrrhiza uralensis* on Anti-*Aeromonas hydrophila* infection of giant salamander (*Andrias davidianus*) .....  
..... WANG Wen-Bo, CAO Juan, LI Chun-Ying, SUN Sheng-Yan, HUANG Yu-Ying, LIU Yi-Nan and LU Yi-Shan (1837)  
Expression of β-defensin of micropterus salmoides in baculovirus system and its antibacterial activity analysis .....  
..... GUAN Cui-Cui, QIU Reng, LI Jie-Qiong, JIANG Chang-Jun and YAO Lun-Guang (1843)  
Transcriptome analysis revealed the immune response of large yellow croaker (*Larimichthys crocea*) in early stage of *Vibrio alginolyticus* infection .....  
..... CHENG An-Yi, WANG Yong-Yang, WENG Hua-Song, CHEN Xin-Hua and ZHANG Wei-Ni (1854)  
Chemotactic activity and immune adjuvant effect of grass carp beta defensin 1 .....  
..... KUANG Rui, ZHOU Jian-Cheng, LIU Xiao-Ling, SU Jian-Guo and YUAN Gai-Ling (1866)  
Production and characterisation of IL-10 monoclonal antibodies in grass carp (*Ctenopharyngodon idella*) .....  
..... LIU Qin, JIA Zhao, CHEN Kang-Yong, ZHU Xiao-Zhen, WANG Zi-Xuan, CHEN Jing, WANG Jun-Ya, LI Yao-Guo, XIAO Tiao-Yi and ZOU Jun (1875)  
Screening, identification and physiological characteristics of intestinal bacteria against *Vibrio harveyi* from *Penaeus monodon* ..... LIU Ji-Dan,  
FAN Ying, LIU Hong-Jun, TANG Xue-Xi, WANG Xiao-Lu, WANG You-Hong, YE Hai-Bin and GAI Chun-Lei (1887)  
Molecular characterization of two novel antimicrobial peptides myticalin and mytimacin from *Mytilus coruscus* ..... LIU Lu,  
YANG Jin-Yue, YANG Zong-Xin, HE Jian-Yu, ZHANG Xiao-Lin, HE Meng-Lan, YAN Xiao-Jun and LIAO Zhi (1898)

### Water Ecology and Fisheries

- Physicochemical properties and organic carbon sources of the sediments in a karst spring-fed river .....  
..... YU Jun-Qi, BAI Bing, LI Guang-Chao, WANG De-Wei, WANG Pei, ZHOU Qiao-Hong and WU Zhen-Bin (1908)  
Synergetic effect of light and nutrients on the release of dissolved organic carbon from juveniles of *Saccharina japonica* ..... NI  
Zhi-Jie, ZHANG Yong-Sheng, CHU Hong-Yong, LI Bin, ZHANG Ming-Liang, SUN Yan-Qing and HU Shun-Xin (1914)  
Inhibitory effect of *Scenedesmus* sp. on *Microcystis aeruginosa* and its evaluation .....  
..... SONG Chan-Yuan, BAI Fang, LI Tian-Li and SONG Li-Rong (1923)  
Effects of rice-fish coculture on rice yield: a Meta-analysis .....  
..... CAI Shu-Fang, HUANG Xian-Guang, HUANG Hui-Zhen, BAO Wei, ZHANG Zhong and LEI Jin-Gui (1931)  
Paternity test technology based on microsatellite marker islet ..... XIE Min-Min,  
WANG Ya-Kun, WEI Cheng-Qing, CHEN Chen, LIU Xiao-Li, LI Wei, HONG Xiao-You and ZHU Xin-Ping (1938)  
Induction of XX pseudo-males, and large-scale reproduction of all-female population in yellow catfish .....  
..... LIU Ya, YU Yue, LU Zi-Yi, DING Yang, FAN Qi-Xue and SHEN Zhi-Gang (1948)