

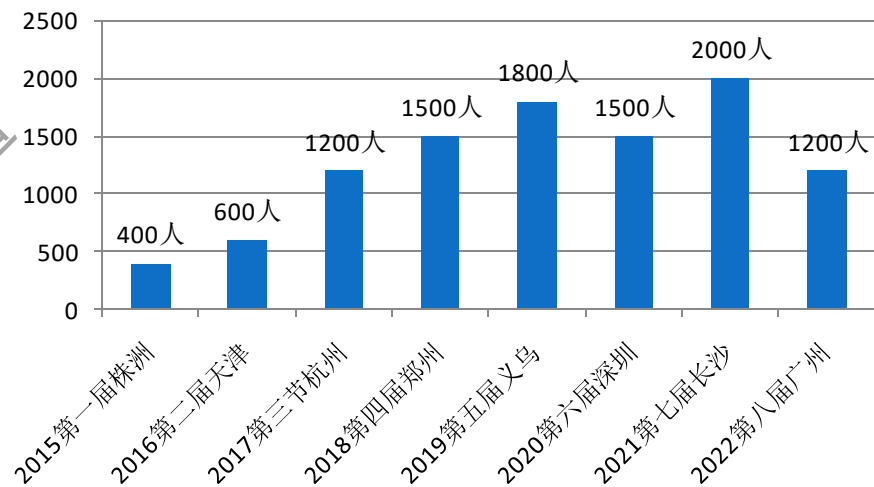
给水排水 2022 给水大会 PPT



2022 给水大会——智慧水务论坛



2022 给水大会——水厂改造论坛



2022 给水大会——二次供水论坛



2022 给水大会——供水产销差培训



2022 给水大会——营商环境培训



2022 给水大会——水泵节能培训

给水排水

2022会议活动预告



《给水排水》官方微信
22万+专业粉丝共同关注

时间	地点	活动内容	人数	参会成员分析
待定	上海	第十一届中国水业院士专家论坛	800	综合
8.13-18	广州	2022给水大会（第八届） ① 分论坛一：中国城市智慧水务高峰论坛 ② 分论坛二：净水厂现代化技术改造论坛 ③ 分论坛三：二次供水与老旧小区给排水改造论坛 ④ 培训班一：供水管网产销差控制研修班 ⑤ 培训班二：优化供水接入营商环境研修班 ⑥ 培训班三：中小型供水泵站节能技术方案研修班 ⑦ 主任沙龙：自来水公司信息中心建设与管理专题	1200	水司+设计院占60%
8.23-25	广州	2022水环境大会 2022城市黑臭水体治理与流域水环境整治技术研讨会 暨现场观摩会 第十一届城市排水防涝与雨洪控制利用技术研讨会 暨2022海绵城市建设研讨会	800	总承包单位+设计院占60%
9月	苏州	中国勘察设计协会水系统分会年会暨换届大会	400	设计院占60%
9月	青岛	2022中国城市垃圾渗沥液处理论坛（第九届）	500	业主+总包占60%
10月	宁波	2022排水大会（第八届） （污水处理提质增效、污泥处理处置、排水管网修复）	600	排水业主占60%
待定	浙江	2022(第六届)中国农村污水治理与饮水安全提升高峰论坛 暨亚洲开发银行中国农村污水管理研讨会	500	总包+设计院占60%
待定	成都	国家污泥处理处置产业技术联盟大会 暨中国城市环境卫生协会污泥处理处置专委会年会	500	排水公司+设计院占60%

联系电话：010-57368815



广州市市政工程设计研究总院有限公司

Guangzhou Municipal Engineering Design & Research Institute CO., Ltd.

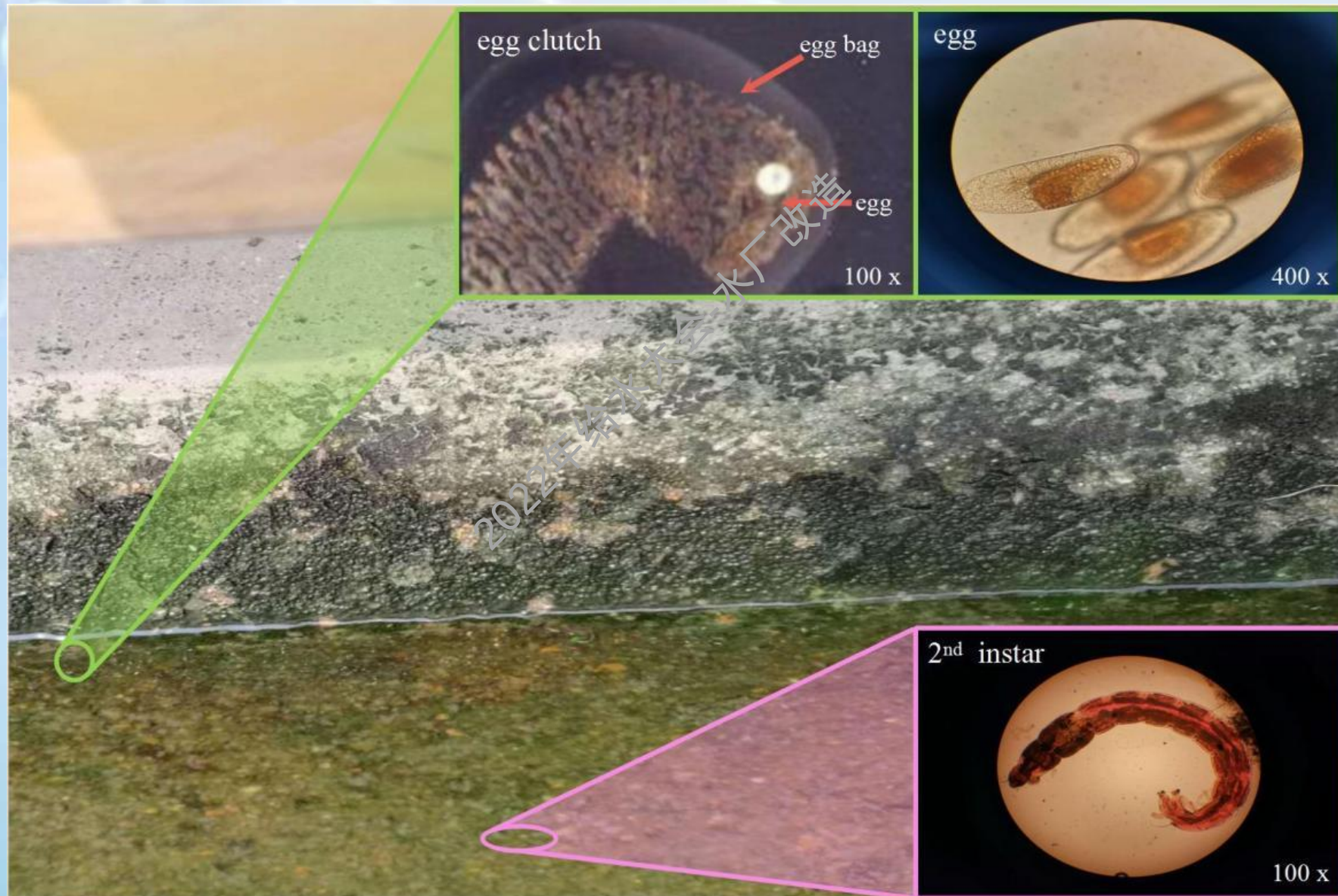
2022

饮用水系统中超声波防治蚊卵关键技术研究

汇报人：张锐坚

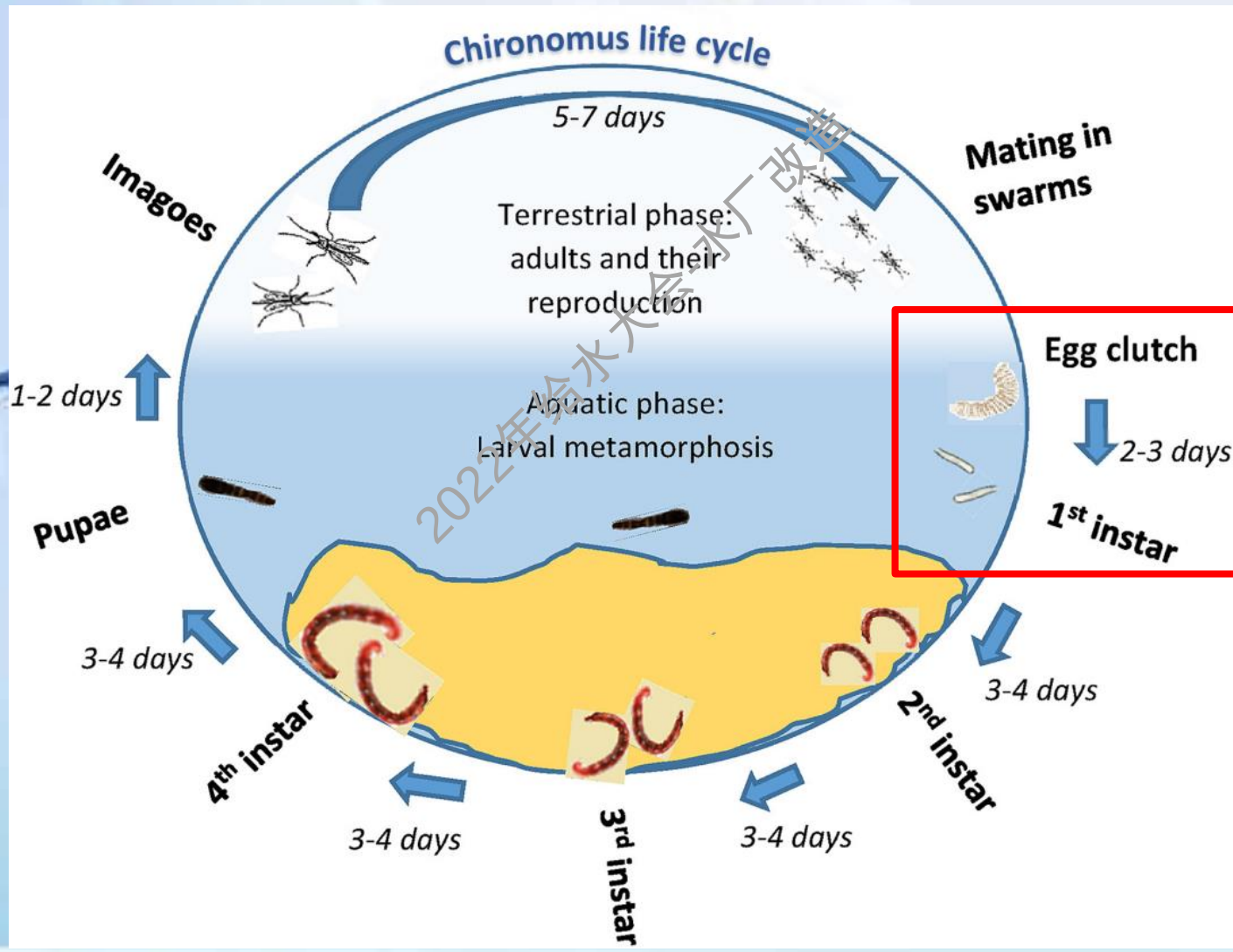
研究背景

南方某水厂自建成以来，沉淀池壁面水位线经常附着大量摇蚊卵束

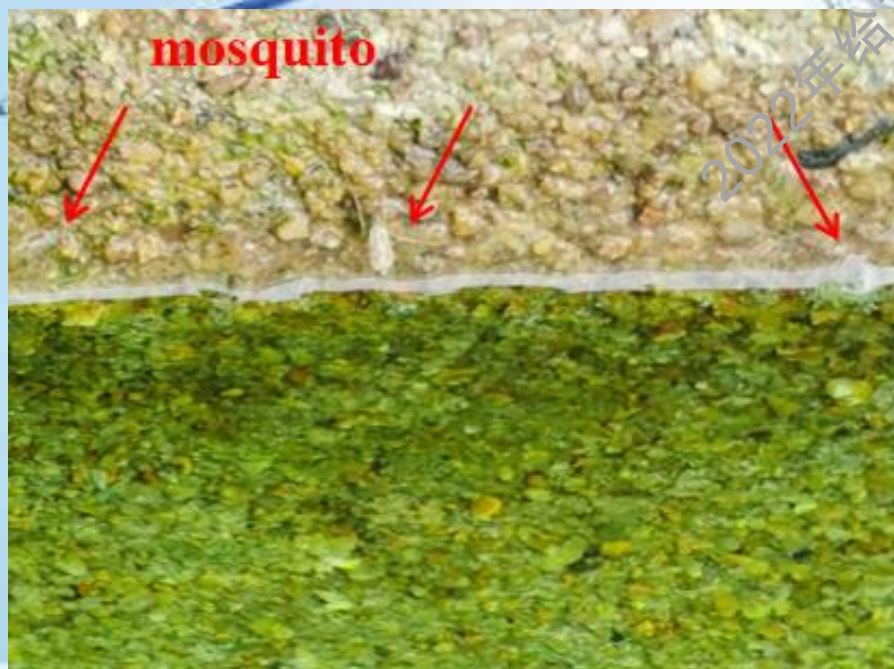
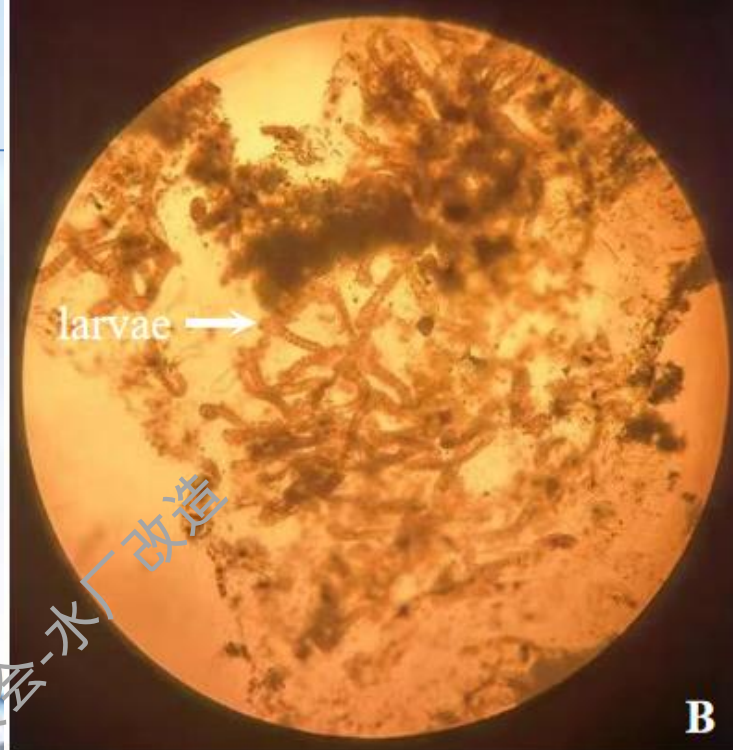


研究背景

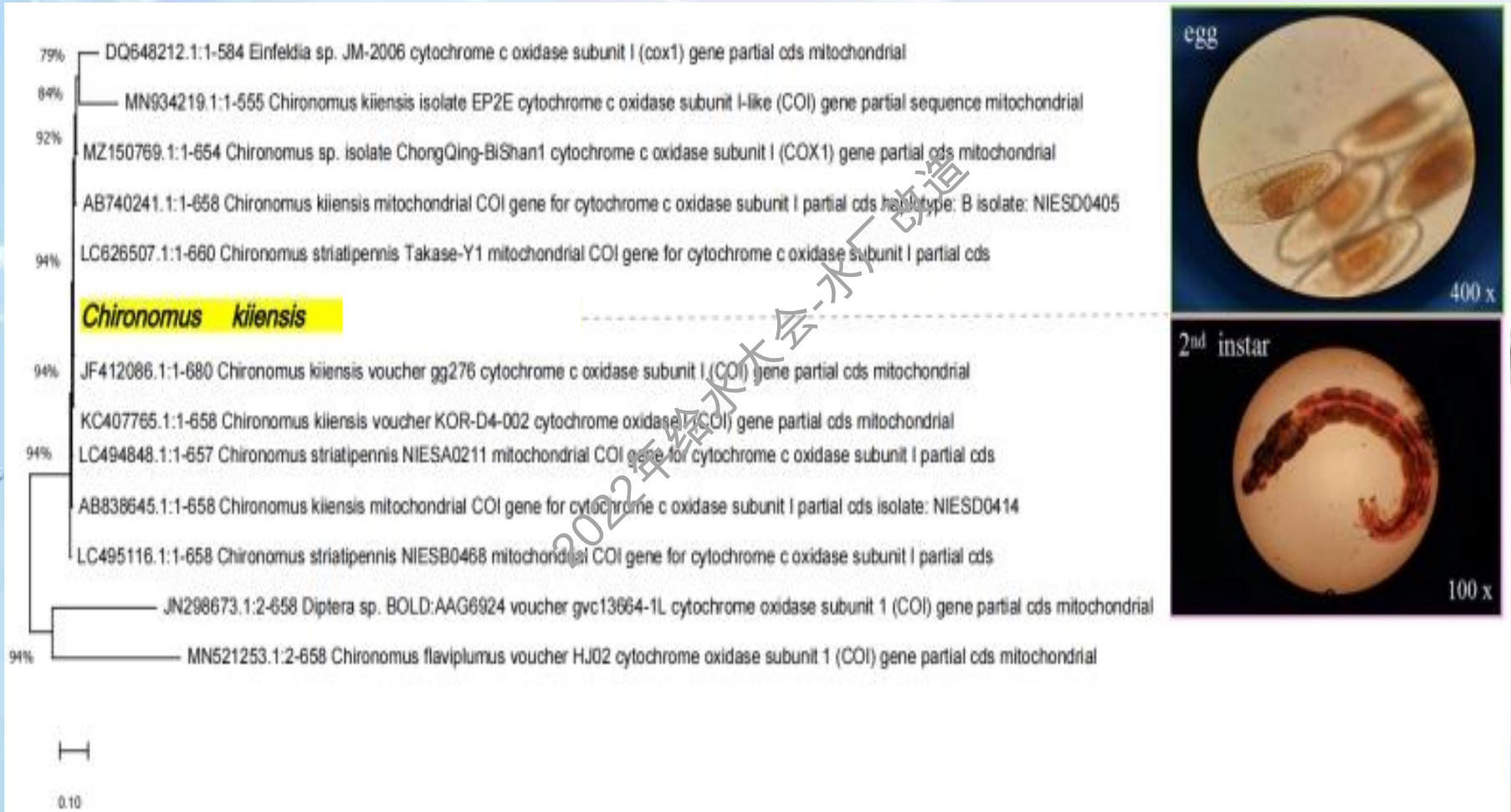
摇蚊生命周期分为 4 个阶段：卵（egg clutch）、幼虫（instar）、蛹（pupae）和成虫（imagoes）



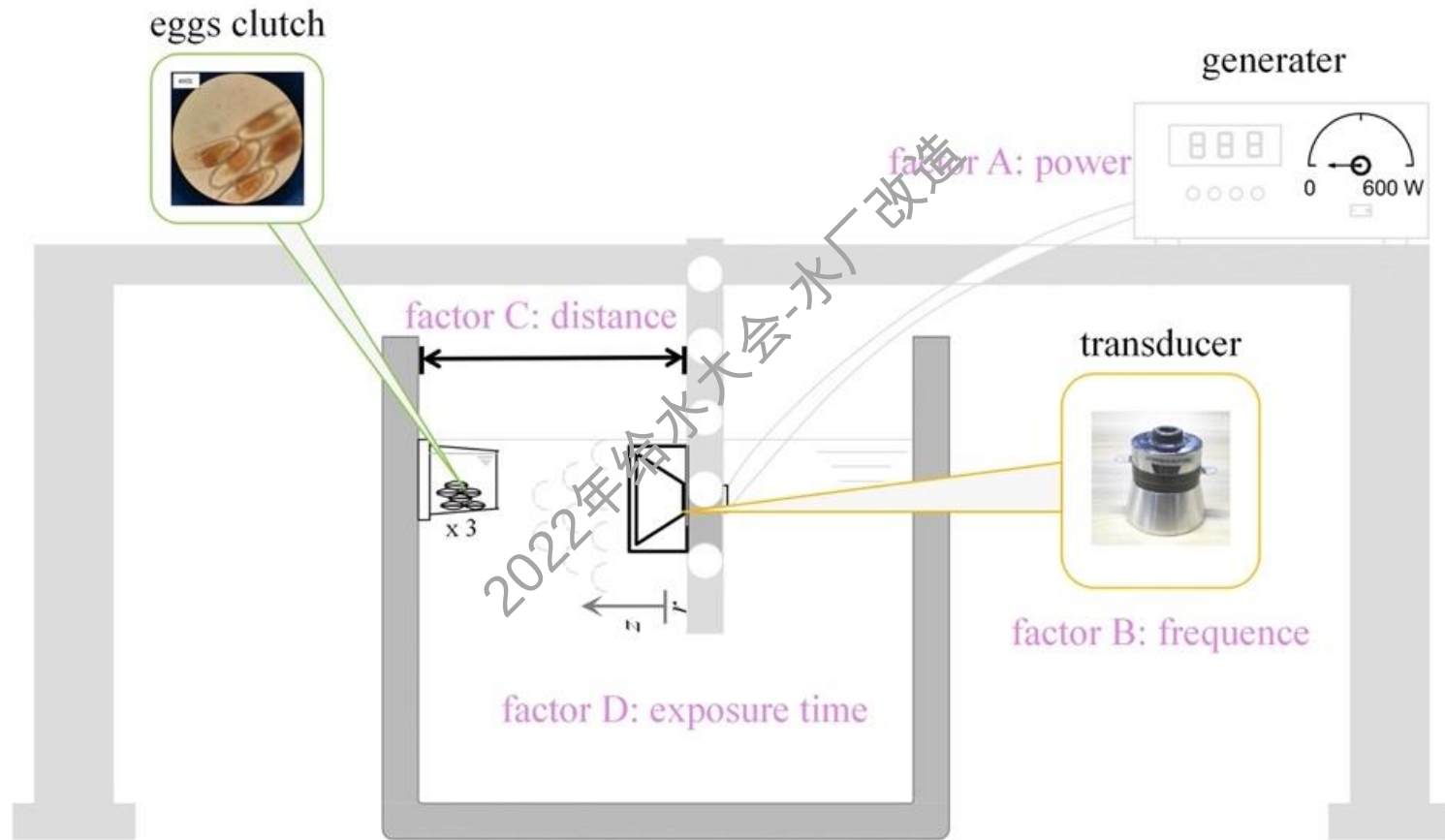
研究背景



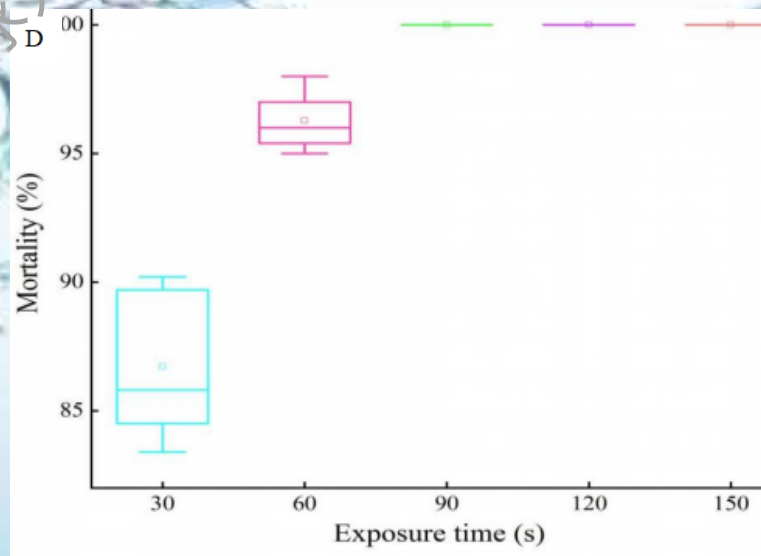
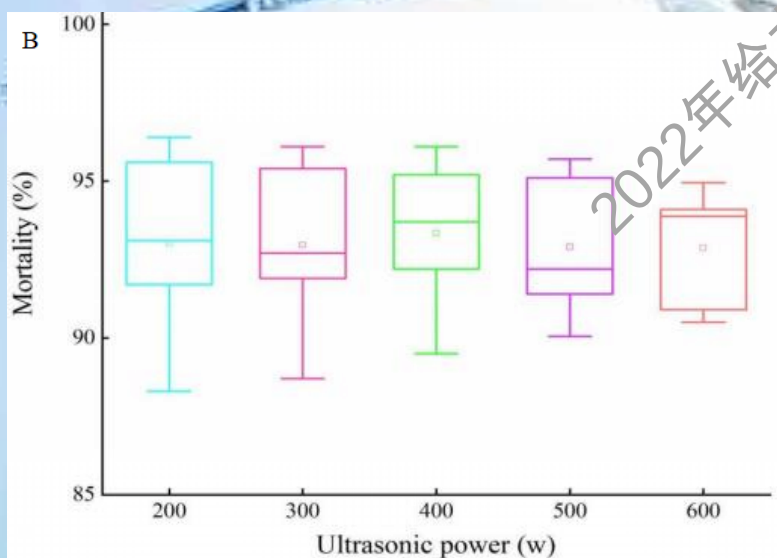
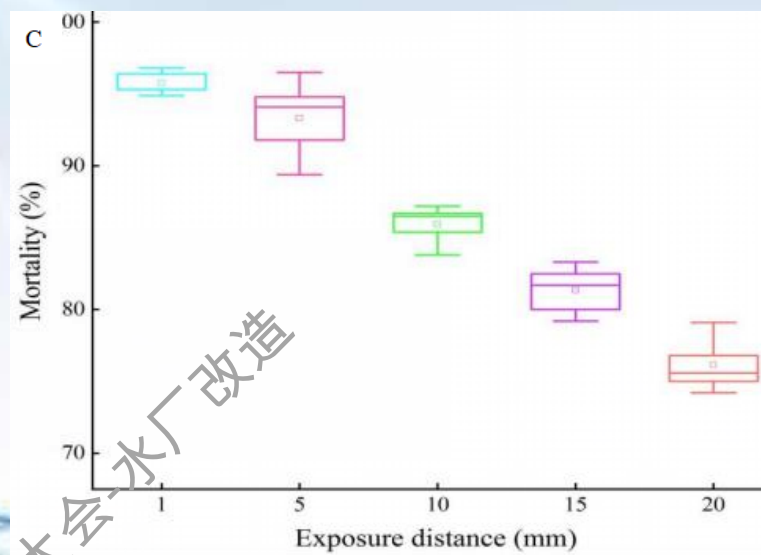
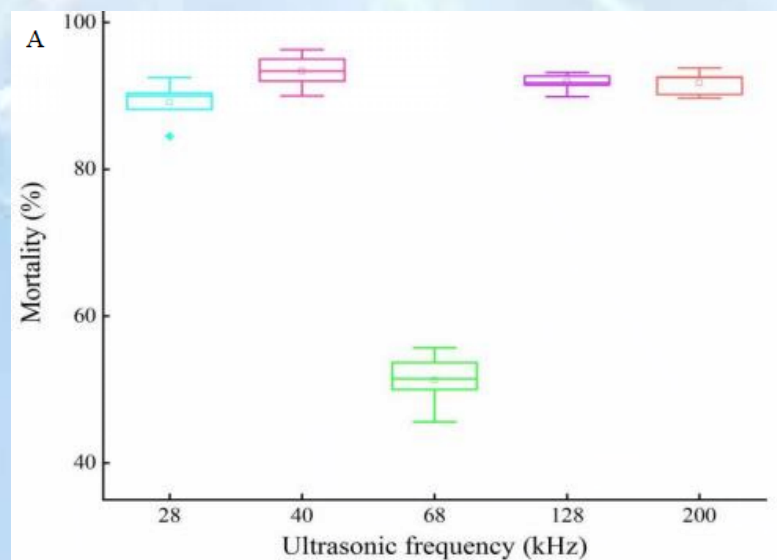
摇蚊的形态和种类鉴定



试验方法和设备介绍

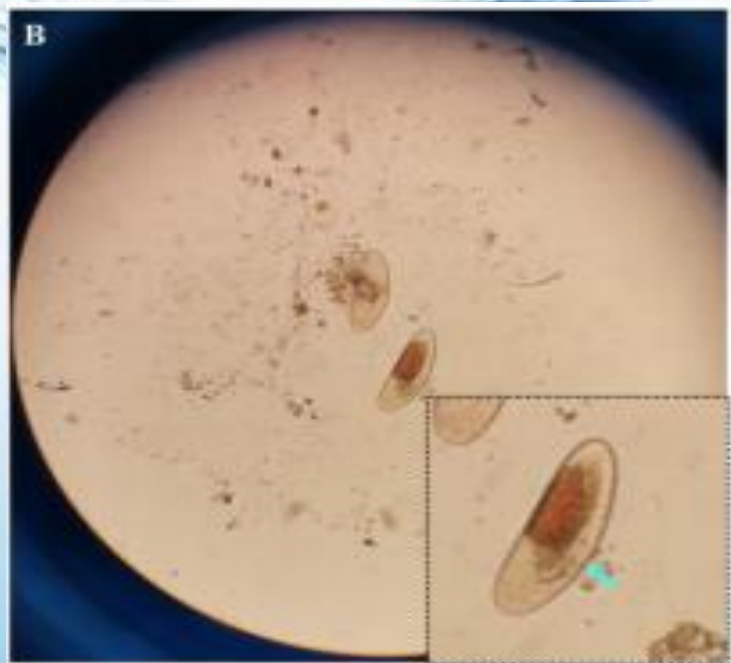
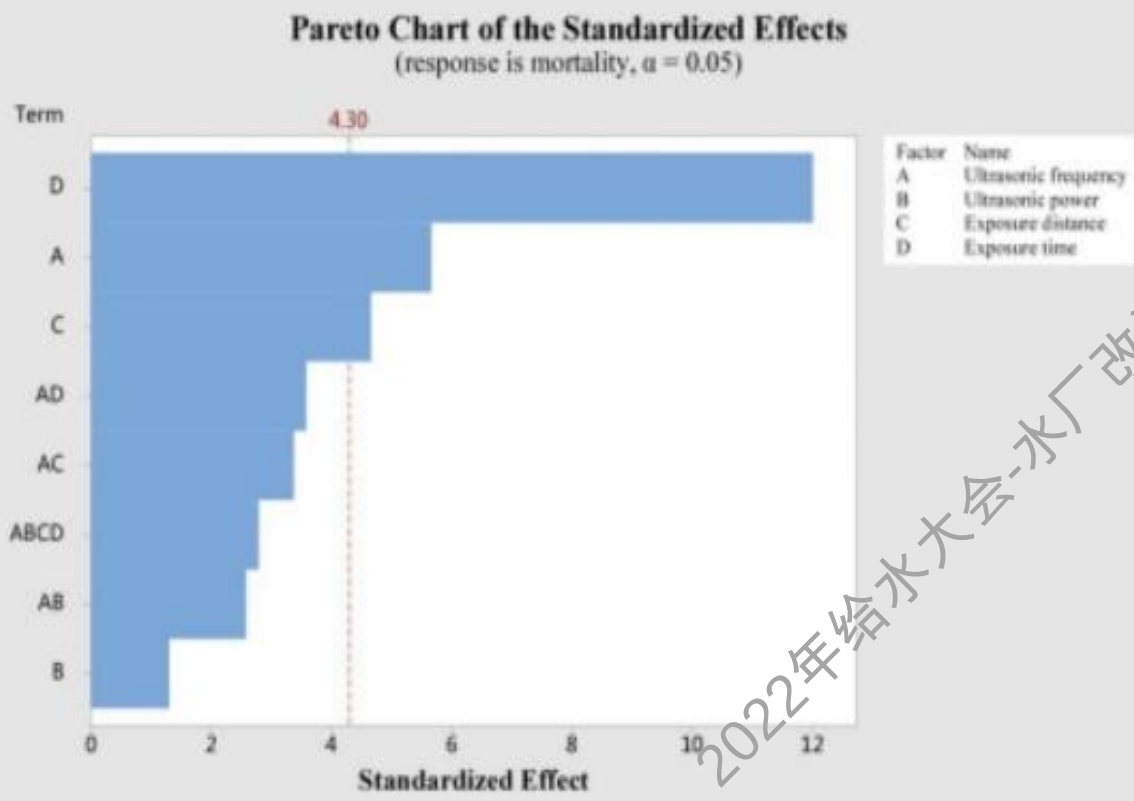


单因素实验

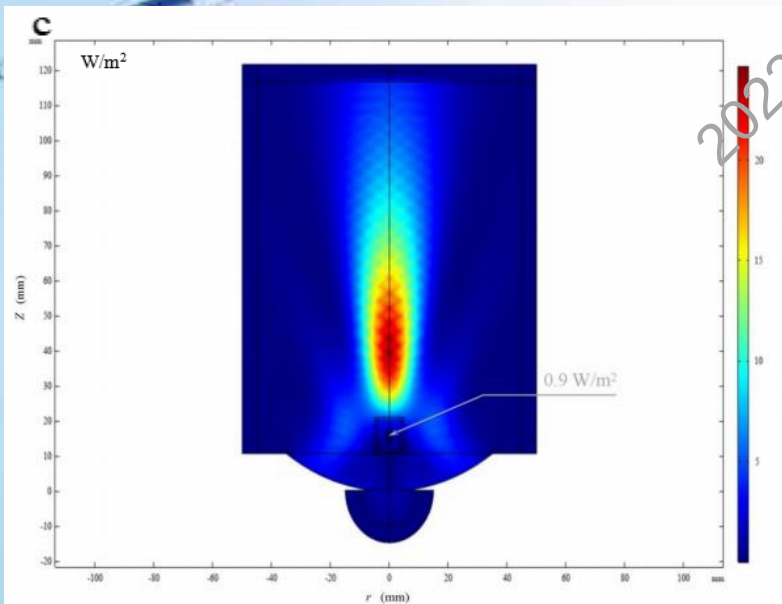
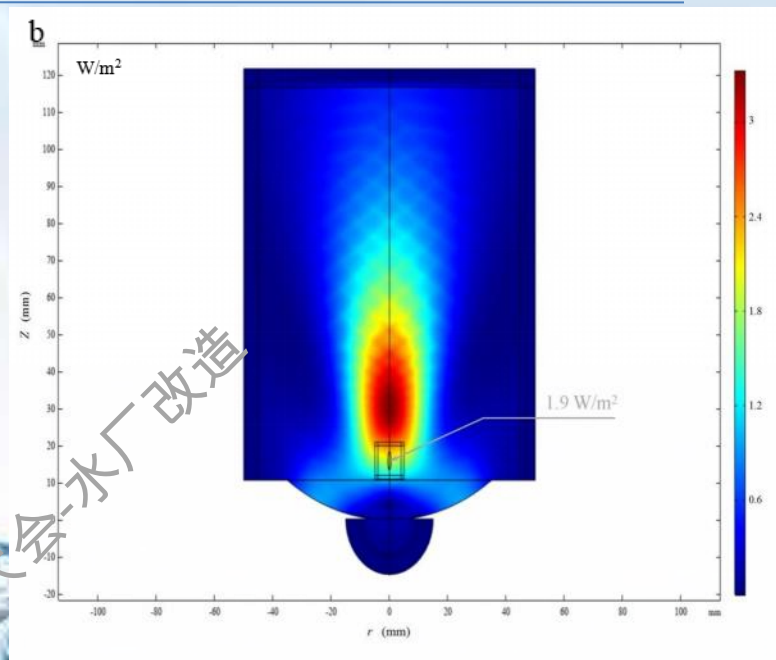
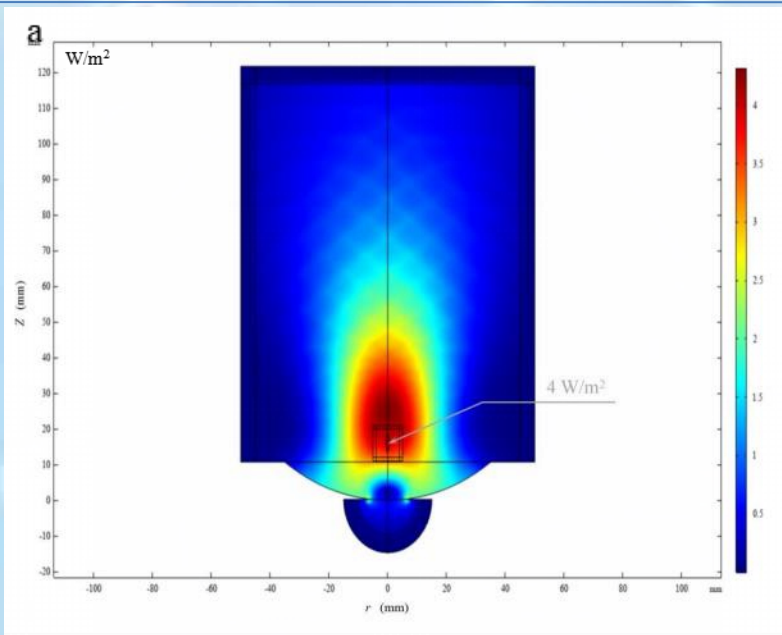


超声波频率(A)、超声波功率(B)、暴露距离(C)和暴露时间(D)
灭活摇蚊卵的单因素试验。

主要试验结果



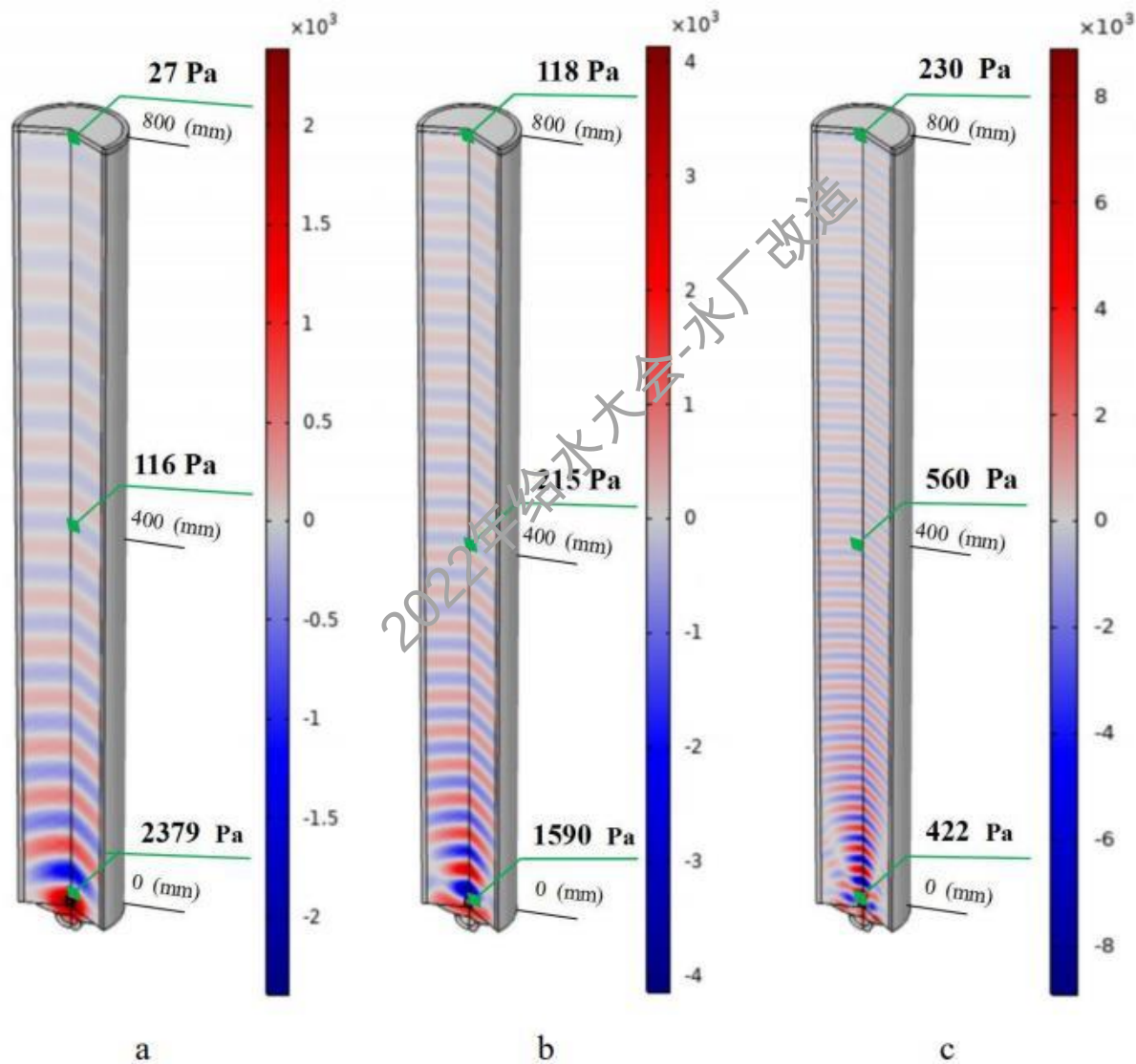
COMSOL声场分析



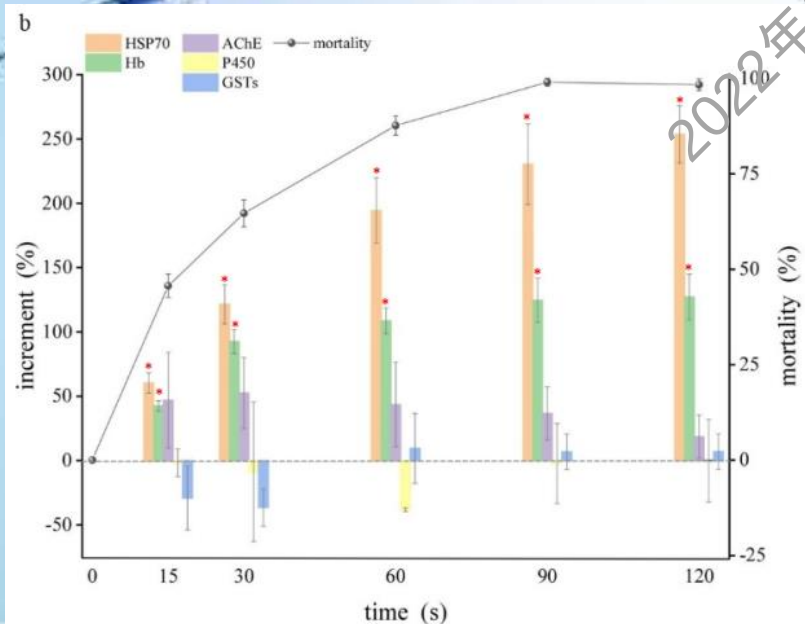
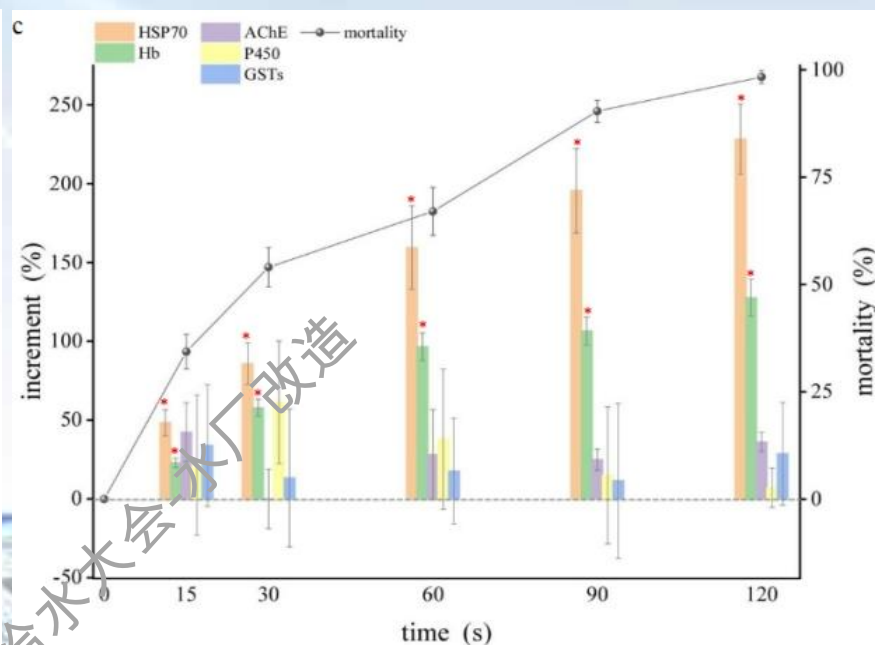
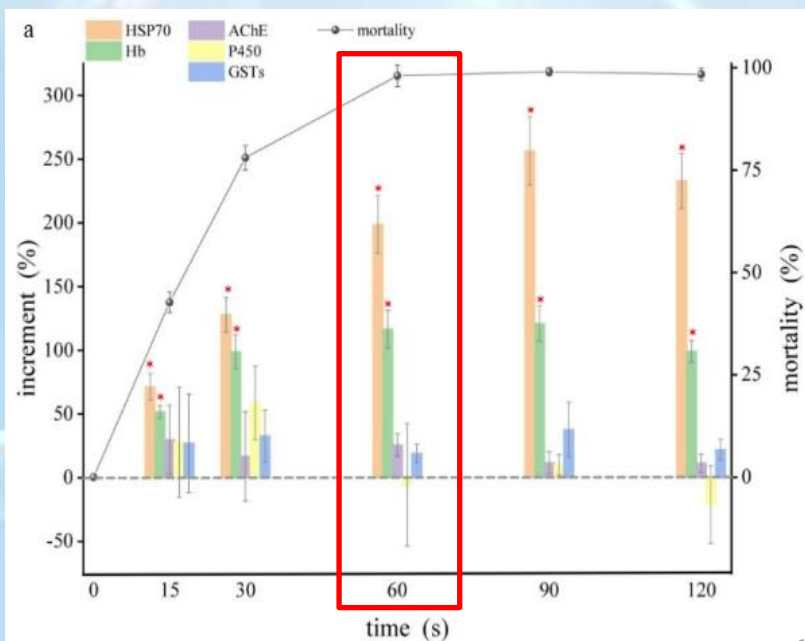
频率为(a) 28 kHz、(b) 40kHz、(c) 68 kHz的超声处理过程中声压强度($\text{W} \cdot \text{m}^{-2}$)的分布。

COMSOL声场分析

频率为(a) 28 kHz、(b) 40 kHz和(c) 68 kHz时r-Z平面内的声压(Pa)分布



蛋白质含量、酶活性变化



(a) 28 kHz、(b) 40 kHz和(c) 68 kHz超声波辐射下，花翅摇蚊卵的死亡率(%)及其热休克蛋白70 (HSP70)、血红蛋白(Hb)、谷胱甘肽s -转移酶(GSTs)、细胞色素P450 (P450)和乙酰胆碱酯酶(AChE)的增量(%)



Effects and mechanism of ultrasound treatment on *Chironomus kiiensis* eggs

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Received: 17 November 2021 / Accepted: 1 July 2022

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Abstract

Chironomids are abundant insects in freshwater ecosystems and lay in still or slow-moving water. The walls of sedimentation tanks in drinking water treatment plants (DWTP) provide such laying habitat, which can lead to larval outbreaks in plant effluent. While chironomid larvae are often associated with poor hygiene, effective methods to control outbreaks are needed. Here, we assessed the effect of ultrasound treatment on *Chironomus kiiensis*' eggs. The mortality rate of eggs was examined after ultrasound treatment, and the protein content (heat shock protein 70 and hemoglobin) and enzymatic activities of acetylcholinesterase, cytochrome P₄₅₀, and glutathione S-transferases involved in the ultrasound-induced stress response were analyzed before and after treatment. COMSOL software was also used to examine the characteristics of the ultrasonic field, including frequency, power, exposure distance, and time. Higher egg mortality was observed at lower frequencies. At 28 kHz, 450 W, 15-mm exposure distance, and 75-s exposure time, 72.4% of eggs showed apoptosis after exposure. At higher frequencies (68 kHz), mortality decreased to 50.9%. Exposure time and distance also significantly affected egg mortality. From the geometric models, it could be seen that *C. kiiensis*' eggs sustained much greater acoustic pressure (2379 Pa) with 28-kHz exposure than that with 68-kHz exposure (422 Pa); however, the propagation distance was greater at the higher frequency. The hydraulic shear force effect of the ultrasonic radiation appeared to be the primary factor in egg mortality. We expected that array of ultrasonic transducers embedded in the walls of water treatment plants could be effective in killing *Chironomus*' eggs and highlight the potential for ultrasound as an effective treatment for the prevention of *Chironomus* outbreaks in treatment plant effluents.

Keywords Ultrasound · Ultrasonic treatment · Chironomidae · Egg mortality · COMSOL

设备与效果图



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2022年给水工程改造