



Q K 2 2 0 2 1 2 3

ISSN 0001 - 6209  
CN 11-1995/Q

# AMS

Acta Microbiologica Sinica

# 微生物学报

<http://journals.im.ac.cn/actamicrocn>

主办 / 中国科学院微生物研究所 中国微生物学会 出版 / 科学出版社



01

2022 VOL.62

# 中文目次

## 特邀专稿

- 1 新疆不同栖息地赤麻鸭肠道菌群多样性研究  
杜菲, 王瑞红, 曹建, 彭鹏, 阿木提喀日·马木提, 常娜娜, 初冬, 孙贺廷, 马正海, 毕玉海
- 10 H5N8亚型高致病性禽流感病毒的全球流行概况  
李仪, 刘化金, 李祥, 吕欣孺, 柴洪亮

## 综述

- 24 严格厌氧菌铁氧还蛋白的研究进展  
张屹清, 林路友, 路争
- 33 藻际环境中微生物胞间通讯行为及作用  
刘莹璐, 陈从立, 付亮, 周丹丹
- 47 细菌生物被膜基质的研究进展  
刘静聪, 方金玉, 朱军莉
- 57 梅毒螺旋体的营养物质转运及能量合成相关代谢机制研究  
江晗, 谢碧波, 赵思思, 尹卫国, 赵飞骏
- 65 枯草芽孢杆菌表面展示技术用于黏膜疫苗的研究进展  
李威杰, 刘明刚, 李建臻, 潘康成

## 研究报告

- 77 代谢工程改造热带假丝酵母高效合成中链 $\omega$ -羟基脂肪酸  
王世杰, 张海冰, 沈微, 杨海泉, 夏媛媛, 曹钰, 陈献忠
- 90 小麦隐匿柄锈菌与小麦互作不同阶段的基因差异表达分析  
崔立平, 张瑞丰, 范学锋, 张维宏, 刘大群, 杨文香
- 103 紫色红曲霉Mp-21次级代谢产物抗氧化及抑制 $\alpha$ -葡萄糖苷酶活性的研究  
丁允章, 孔黎春, 张奕嘉, 蒋冬花
- 119 典型岩溶槽谷区氨氧化微生物丰度对隧道建设的响应——以中梁山为例  
陈畅, 贾亚男, 贺秋芳, 蒋勇军, 叶凯, 王业荣
- 131 烟芽夜蛾囊泡病毒3h株编码的3H-117蛋白能干扰AcMNPV的口服活性  
李诗薇, 欧阳依依, 杨长锦, 童悦, 甘佳敏, 黄国华, 于欢
- 145 短杆菌属海洋环境适应机制的泛基因组学  
裴盛祥, 黄小云, 牛四文, 谢富全, 张改云
- 160 灰飞虱核心共生菌的鉴定  
孙红波, 姜军, 陈丽莹, 宋泽润, 刘达, 杨杰, 霍岩, 方荣祥, 张莉莉
- 176 Mn<sup>2+</sup>对A/O-BAF系统处理效能和细菌群落多样性的影响  
严子春, 李永波, 彭虎
- 189 一种几丁质裂解性多糖单加氧酶的活性评价及稳定性研究  
于晓男, 刘霖, 屈明博, 杨青
- 200 一株降解PET单体对苯二甲酸的施氏假单胞菌的筛选和基因组分析  
刘盼, 张彤, 郑义, 李庆宾, 梁泉峰, 祁庆生

## 213 胡杨叶片及韧皮部内生细菌多样性及生物学功能分析

杨多, 岳海涛, 伍杰毅, 赵鲁玉, 邢祥祥, 郭飞, 杨洁

## 227 粘细菌*Corallococcus* sp. strain EGB及其培养发酵液的安全性评估

乔燕, 夏丞垚, 李永凯, 李周坤, 叶现丰, 罗雪, 黄彦, 曹慧, 崔中利

## 242 长期施磷对石灰性土壤中编码碱性磷酸酶基因的细菌群落的影响

郎明, 李佳颖, 苏卫华, 邹温馨, 刘于, 陈新平

## 259 放牧藏猪、舍饲藏猪与商品猪粪便真菌群落组成及其与饲粮纤维消化的相关性研究

谭占坤, 池福敏, 商振达, 商鹏, 刘锁珠, 强巴央宗

## 275 Zn(II)对好氧反硝化菌*Acinetobacter* sp. JR-142的代谢活性影响

朱婉瑜, 侍浏洋, 赵维, 黄志勇, 马安周, 王兴彪

## 291 福林霉素生物合成基因簇的组装和异源表达

李兴, 韩舒婷, 马婧贤, 陶美凤, 康前进, 白林泉, 邓子新

## 305 不同饲喂下棉铃虫肠道内生菌的分离鉴定及脱毒效果研究

侯敏, 张晨曦, 詹发强, 杨蓉, 龙宣杞, 崔卫东

## 321 混合菌群调节果蝇产卵偏嗜性

王子光, 门杰, 张津, 黄永存, 刘威

## 333 产S-雌马酚梭菌C1三代全基因组测序及功能基因筛选鉴定

胡云霏, 阳婷, 王春霖, 冯然, 陈华海, 李降龙, 尹业师

## 346 独岛枝芽孢杆菌MCCC 1A00493产生的4-乙烯基苯酚鉴定和作用南方根结线虫特性研究

黄典, 余豪, 陈稳, 程万里, 邵宗泽, 张吉斌

## 357 海伦脑炎微孢子虫分泌蛋白EhPTP4对宿主内质网蛋白降解通路的调控作用(英文)

韩尹泽, 郁海龙, 徐金智, 罗城, 陈佳靖, 韩冰, 李田, 周泽扬

## 374 海水来源的548株真菌的近海及远海分布模式及其抑菌活性分析

任娜, 朱四东, 陈秀暖, 陈婷, 王景, 徐莹, 杨季芳, 陈吉刚

## 其他

封二 《微生物学报》2021年度“优秀论文”名单

文后I 《微生物学报》编委会名单

文后II 《微生物学报》征稿简则

封三 《微生物学报》2021年度“优秀编委”和“突出贡献奖”名单

## 广告

文前(I/II) 国家微生物科学数据中心

文前(III/IV) 镇江东方生物工程设备有限公司

# CONTENTS

## SPECIAL FEATURES

- 1 Diversity of gut microbiota in *Tadorna ferruginea* living in different habitats of Xinjiang province  
DU Fei, WANG Ruihong, CAO Jian, PENG Peng, Mamuti·Amutikari, CHANG Nana, CHU Dong, SUN Heting, MA Zhenghai, Bi Yuhai
- 10 Global epidemiology of H5N8 subtype highly pathogenic avian influenza virus  
LI Yi, LIU Huajin, LI Xiang, LV Xinru, CHAI Hongliang

## REVIEWS

- 24 Advances of ferredoxins from strictly anaerobic bacteria  
ZHANG Yiqing, LIN Luyou, LU Zheng
- 33 The roles of 'cell-to-cell communication' in phycosphere  
LIU Yinglu, CHEN Congli, FU Liang, ZHOU Dandan
- 47 A brief review of biofilm matrix in structured microbial communities  
LIU Jingcong, FANG Jinyu, ZHU Junli
- 57 Metabolic mechanisms of nutrients transport and energy synthesis of *Treponema pallidum*  
JIANG Han, XIE Bibo, ZHAO Sisi, YIN Weiguo, ZHAO Feijun
- 65 Research progress on *Bacillus subtilis* surface display technology for mucosal vaccine  
LI Weijie, LIU Minggang, LI Jianzhen, PAN Kangcheng

## RESEARCH ARTICLES

- 77 Efficient synthesis of medium-chain  $\omega$ -hydroxy fatty acids by metabolic engineering in *Candida tropicalis*  
WANG Shijie, ZHANG Haibing, SHEN Wei, YANG Haiquan, XIA Yuanyuan, CAO Yu, CHEN Xianzhong
- 90 Analysis of differentially expressed genes in *Puccinia triticina* at different stages of the interaction between wheat and wheat leaf rust pathogen  
CUI Liping, ZHANG Ruifeng, FAN Xuefeng, ZHANG Weihong, LIU Daqun, YANG Wenxiang
- 103 Antioxidation and inhibition of  $\alpha$ -glucosidase activity of secondary metabolites of *Monascus purpureus* Mp-21  
DING Yunzhang, KONG Lichun, ZHANG Yijia, JIANG Donghua
- 119 Responses of the ammonia-oxidizing microorganisms' abundance to tunnel evacuation in karst trough valley: a case study in Zhongliang Mountain, Chongqing, China  
CHEN Chang, JIA Yanan, HE Qiufang, JIANG Yongjun, YE Kai, WANG Yerong
- 131 3H-117 encoded by *Heliothis virescens* ascovirus 3h interferes the oral activity of AcMNPV  
LI Shiwei, OUYANG Yiyi, YANG Changjin, TONG Yue, GAN Jiamin, HUANG Guohua, YU Huan
- 145 Adaptation mechanism of *Brevibacterium* species to the marine environment based on pan-genomics analysis  
PEI Shengxiang, HUANG Xiaoyun, NIU Siwen, XIE Fuquan, ZHANG Gaiyun
- 160 Identification of the core symbiotic bacteria of *Laodelphax striatellus*  
SUN Hongbo, JIANG Jun, CHEN Liying, SONG Zerun, LIU Da, YANG Jie, HUO Yan, FANG Rongxiang, ZHANG Lili

- 176 Effects of Mn<sup>2+</sup> on the removal efficiency and microbial community diversity of A/O-BAF  
YAN Zichun, LI Yongbo, PENG Hu
- 189 The activity and stability analyses of chitin-activity lytic polysaccharide monooxygenase  
YU Xiaonan, LIU Lin, QU Mingbo, YANG Qing
- 200 Screening and genome analysis of a *Pseudomonas stutzeri* that degrades PET monomer terephthalate  
LIU Pan, ZHANG Tong, ZHENG Yi, LI Qingbin, LIANG Quanfeng, QI Qingsheng
- 213 Diversity and biological function of endophytic bacteria in *Populus euphratica* leaves and phloem  
YANG Duo, YUE Haitao, WU Jieyi, ZHAO Luyu, XING Xiangxiang, GUO Fei, YANG Jie
- 227 Toxicological evaluation of *Corallococcus* sp. strain EGB and its ferments  
QIAO Yan, XIA Chengyao, LI Yongkai, LI Zhoukun, YE Xianfeng, LUO Xue, HUANG Yan, CAO Hui, CUI Zhongli
- 242 Effects of long-term phosphorus application on *phoD* harboring bacterial community in calcareous soil  
LANG Ming, LI Jiaying, SU Weihua, ZOU Wenxin, LIU Yu, CHEN Xinping
- 259 Fungal community in the feces of grazing Tibetan pigs, captive Tibetan pigs, and commercial pigs and its interaction with dietary fiber digestion  
TAN Zhankun, CHI Fumin, SHANG Zhenda, SHANG Peng, LIU Suozhu, QIANGBA Yangzong
- 275 Effects of Zn(II) on metabolic activity of aerobic denitrifier *Acinetobacter* sp. JR-142  
ZHU Wanyu, SHI Liuyang, ZHAO Wei, HUANG Zhiyong, MA Anzhou, WANG Xingbiao
- 291 Assembly and heterologous expression of the pholipomycin biosynthetic gene cluster  
LI Xing, HAN Shuting, MA Jingxian, TAO Meifeng, KANG Qianjin, BAI Linquan, DENG Zixin
- 305 Isolation, identification and detoxification of intestinal endophytes of *Helicoverpa armigera* under different feeding  
HOU Min, ZHANG Chenxi, ZHAN Faqiang, YANG Rong, LONG Xuanqi, CUI Weidong
- 321 Mixed bacteria modulate oviposition preference of *Drosophila*  
WANG Ziguang, MEN Jie, ZHANG Jin, HUANG Yongcun, LIU Wei
- 333 Whole genome sequencing and functional gene screening of *S-equol*-producing *Clostridium* sp. C1  
HU Yunfei, YANG Ting, WANG Chunlin, FENG Ran, CHEN Huahai, LI Xianglong, YIN Yeshi
- 346 Identification and characteristics of 4-vinylphenol from *Virgibacillus dokdonensis* MCCC 1A00493 against *Meloidogyne incognita*  
HUANG Dian, YU Hao, CHEN Wen, CHENG Wanli, SHAO Zongze, ZHANG Jibin
- 357 Microsporidian *Encephalitozoon hellem* secretes EhPTP4 to regulate host endoplasmic reticulum-associated degradation  
HAN Yinze, GAO Hailong, XU Jinzhi, LUO Jian, CHEN Jiajing, HAN Bing, LI Tian, ZHOU Zeyang
- 374 Distribution pattern and antibacterial activity of 548 fungi from offshore and pelagic seawater  
REN Na, ZHU Sidong, CHEN Xiunuan, CHEN Ting, WANG Jing, XU Ying, YANG Jifang, CHEN Jigang

(本期责编：李磊)

微生物学报  
Acta Microbiologica Sinica



每月4日出版

CODEN WSHPA8  
海外发行代号：M67  
国内邮发代号：2-504  
邮箱：[actamicro@im.ac.cn](mailto:actamicro@im.ac.cn)  
定价：160元/期

网址：<http://journals.im.ac.cn/actamicrocn>

ISSN 0001-6209



9 770001 620224