

ISSN 1000-0933
CN 11-2031/Q

生态学报

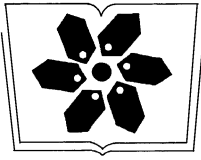
Acta Ecologica Sinica



第 31 卷 第 23 期 Vol.31 No.23 **2011**

中国生态学学会
中国科学院生态环境研究中心
科学出版社

主办
出版



中国科学院科学出版基金资助出版

生态学报

(SHENGTAI XUEBAO)

第 31 卷 第 23 期 2011 年 12 月 (半月刊)

目 次

不同海拔高度高寒草甸光能利用效率的遥感模拟	付 刚,周宇庭,沈振西,等	(6989)
天山雪岭云杉大气花粉含量对气温变化的响应	潘燕芳,阎 顺,穆桂金,等	(6999)
春季季风转换期间孟加拉湾的初级生产力	刘华雪,柯志新,宋星宇,等	(7007)
降水量对川西北高寒草甸牦牛粪分解速率的影响	吴新卫,李国勇,孙书存	(7013)
基于 SOFM 网络对黄土高原森林生态系统的养分循环分类研究	陈 凯,刘增文,李 俊,等	(7022)
不同油松种源光合和荧光参数对水分胁迫的响应特征	王 琰,陈建文,狄晓艳	(7031)
盐生境下硅对坪用高羊茅生物学特性的影响	刘慧霞,郭兴华,郭正刚	(7039)
高温胁迫对不同种源希蒙得木叶片生理特性的影响	黄激激,张念念,胡庭兴,等	(7047)
黄土高原水土保持林对土壤水分的影响	张建军,李慧敏,徐佳佳	(7056)
青杨雌雄群体沿海拔梯度的分布特征	王志峰,胥 晓,李霄峰,等	(7067)
大亚湾西北部春季大型底栖动物群落特征	杜飞雁,林 钦,贾晓平,等	(7075)
湛江港湾浮游桡足类群落结构的季节变化和影响因素	张才学,龚玉艳,王学锋,等	(7086)
台湾海峡鲈鱼种群遗传结构	张丽艳,苏永全,王航俊,等	(7097)
洱海入湖河流苴河下游氮磷季节性变化特征及主要影响因素	于 超,储金宇,白晓华,等	(7104)
转基因鱼试验湖泊铜锈环棱螺种群动态及次级生产力	熊 晶,谢志才,蒋小明,等	(7112)
河口湿地植物活体-枯落物-土壤的碳氮磷生态化学计量特征	王维奇,徐玲琳,曾从盛,等	(7119)
EDTA 对铅锌尾矿改良土壤上玉米生长及铅锌累积特征的影响	王红新,胡 锋,许信旺,等	(7125)
不同包膜控释尿素对农田土壤氮挥发的影响	卢艳艳,宋付朋	(7133)
垄作栽培对高产田夏玉米光合特性及产量的影响	马 丽,李潮海,付 景,等	(7141)
DCD 不同施用时间对小麦生长期 N ₂ O 排放的影响	纪 洋,余 佳,马 静,等	(7151)
氮肥、钙肥和盐处理在冬小麦融冻胁迫适应中的生理调控作用	刘建芳,周瑞莲,赵 梅,等	(7161)
东北有机及常规大豆对环境影响的生命周期评价	罗 燕,乔玉辉,吴文良	(7170)
土壤施硒对烤烟生理指标的影响	许自成,邵惠芳,孙曙光,等	(7179)
不同种植方式对花生田间小气候效应和产量的影响	宋 伟,赵长星,王月福,等	(7188)
西花蓟马的快速冷驯化及其生态学代价	李鸿波,史 亮,王建军,等	(7196)
温度对麦长管蚜体色变化的影响	邓明明,高欢欢,李 丹,等	(7203)
不同番茄材料对 B 型烟粉虱个体发育和繁殖能力的影响	高建昌,郭广君,国艳梅,等	(7211)
基于生态系统受扰动程度评价的白洋淀生态需水研究	陈 贺,杨 盈,于世伟,等	(7218)
两种典型养鸡模式的能值分析	胡秋红,张力小,王长波	(7227)
四种十八碳脂肪酸抑藻时-效关系分析的数学模型设计	何宗祥,张庭廷	(7235)
流沙湾海草床重金属富集特征	许战州,朱艾嘉,蔡伟叙,等	(7244)
基于 QuickBird 的城市建筑景观格局梯度分析	张培峰,胡远满,熊在平,等	(7251)
景观空间异质性及城市化关联——以江苏省沿江地区为例	车前进,曹有挥,于 露,等	(7261)
基于 CVM 的太湖湿地生态功能恢复居民支付能力与支付意愿相关研究	于文金,谢 剑,邹欣庆	(7271)
专论与综述		
北冰洋海域微食物环研究进展	何剑锋,崔世开,张 芳,等	(7279)
城市绿地的生态环境效应研究进展	苏泳娴,黄光庆,陈修治,等	(7287)
城市地表灰尘中重金属的来源、暴露特征及其环境效应	方凤满,林跃胜,王海东,等	(7301)
研究简报		
三峡库区杉木马尾松混交林土壤 C、N 空间特征	林英华,汪来发,田晓堃,等	(7311)
广州小斑螟发生与环境因子的关系	刘文爱,范航清	(7320)



封面图说: 黄河的宁夏段属于中国的半荒漠地区,这里气候干燥、降水极少(250mm 以下)、植被缺乏、物理风化强烈、风力作用强劲、其蒸发量超过降水量数十倍。人们从黄河中提水引水灌溉土地,就近形成了荒漠中的绿洲。有水就有生命,有水就有绿色。这种独特的条件形成了人与沙较量的生态关系——不是人逼沙退就是沙逼人退。

彩图提供: 陈建伟教授 国家林业局 E-mail: cites.chenjw@163.com

刘文爱, 范航清. 广州小斑螟发生与环境因子的关系. 生态学报, 2011, 31(23): 7320-7324.

Liu W A, Fan H Q. The relationship between *Oligochroa cantonella* Caradja and environmental factors. Acta Ecologica Sinica, 2011, 31(23): 7320-7324.

广州小斑螟发生与环境因子的关系

刘文爱, 范航清*

(广西科学院广西红树林研究中心, 广西红树林保护重点实验室, 北海 536000)

摘要: 广州小斑螟是红树林的一种灾害性的食叶害虫。通过室内饲养和野外观察, 对广州小斑螟的发生和环境因素的关系进行了详细的研究。结果表明, 随着龄级的增加, 取食量增大; 在不同样地不同滩位的虫口密度差异性规律不同; 在单株白骨壤的不同方位虫口密度差异显著, 正南方向虫口密度最高, 正西、正北虫口密度最低; 在单株白骨壤的中上部明显高于下部; 广州小斑螟大龄幼虫较耐水淹, 水淹 6 h 的死亡率为 0; 不同地区温度的差异可导致广州小斑螟的发育进度的不同。

关键词: 广州小斑螟; 环境因素; 白骨壤

The relationship between *Oligochroa cantonella* Caradja and environmental factors

LIU Wenai, FAN Hangqing*

Guangxi Mangrove Research Center, Guangxi Academy of Sciences, Guangxi Key Laboratory of Mangrove Protection, Beihai, Guangxi 536000, China

Abstract: The morphological and biological characteristics of *Oligochroa cantonella* Caradja, a leaf-eating pest of mangroves, were studied by laboratory rearing and field observations. In the laboratory, food consumption increased with age class. Mature larvae consumed the greatest amount of food, especially the 4th and 5th instars, which consumed most of the food supplied for the entire period of larval development. It was concluded that the 4th- and 5th-instar larvae were most harmful, and emphasis should be given to the prevention and treatment of larvae before the 4th-instar stage. populations had a regular distribution, which is very different. In Shatian county, the population density on the inner bar was significantly greater than on the beach. In addition, differences in density were found between populations with different orientations and at different sites of *Avicennia marina*. The density of *O. cantonella* was greatest in south-facing populations, and in the middle and upper sites. This may be a tidal effect with the lower site of *A. marina* being flooded for longer than the upper site, which was only submerged at high tide. By contrast, in Dongwei county, the population density in the crown of *A. marina* was higher than that at the tide line. The population density in the middle site of *A. marina* was greater than that in the upper site, and the population density in the upper leaves of *A. marina* was more than that in the lower leaves. These results may be explained as follows. First, the larvae in the upper site of *A. marina* were easier prey for wasps and hornets. Second, the larvae of *O. cantonella* feed in the crown in the evening and morning, moving to the inner and middle-lower site of the crown during the day. In addition, the older larvae were more resistant to flooding, with no mortality observed even after 6 hours' submergence. After 8 hours' submergence larval mortality increased significantly, with 100% mortality being recorded in those larvae submerged for 12 hours. The results indicated that the larvae of *O. cantonella* were resistant to submergence and adapted to the intertidal environment. Finally, the developmental progress of *O. cantonella* was found to be influenced by temperature in different regions. Pupae accounted for about 50% of all the worm stages in Shatian

基金项目: 广西红树林虫害专项防治研究项目[桂国土资函(2007)20号]; 973计划前期研究专项(2009CB426306); 科技支撑计划专题(2009BADB2B02-02); 广西科学院资助项目(11YJ24HS01)

收稿日期: 2010-10-05; 修订日期: 2011-08-22

* 通讯作者 Corresponding author. E-mail: fanhq666@126.com

county Beihai city, while the pupa of *O. cantonella* accounted for about 47.1% of all worm states in Yuzhouping county Fangchenggang city. The overall developmental time of *O. cantonella* in Fangchenggang city lagged 5—7 days behind that in Beihai city.

Key Words: *Oligochroa cantonella*; Environment; *Avicennia marina*

广州小斑螟(*Oligochroa cantonella* Caradja), 属鳞翅目(Lepidoptera) 螟蛾科(Pyralidae), 是为害白骨壤(*Avicennia marina*)的1种重要食叶性害虫。该虫具有暴食性,大发生时,能在短时间将白骨壤林的叶片吃光,严重地阻碍白骨壤的正常生长。2004年5月下旬,在广西山口保护区靠近合浦县山口镇永安、新村两地就暴发了40年来最严重的一次虫灾,导致白骨壤林中95%的叶子被吃掉,树木严重枯萎^[1]。

目前,国内外对其发生与环境因素的关系未见有详细报道^[2-5]。为对其进行有效的控制和促进红树林健康发展,本文对其发生与环境因素的关系进行详细报道。

1 材料和方法

1.1 实验地点和供试昆虫

试验地点设在广西的沙田、新村、垌尾、竹山、渔舟坪等地区的红树林区,室内供试昆虫采自广西合浦县山口镇附近的红树林区。

1.2 试验方法

1.2.1 室内饲养和试验

在白骨壤林区捕捉1000头以上幼虫,置于养虫室内,用新鲜的白骨壤叶片饲养。利用叶蝶法计算幼虫取食量,测定幼虫耐海水淹能力。

水淹试验:取生长基本一致的大龄幼虫,分为20组,同时放入海水中,每隔1h取出一组进行解剖,统计死亡率。

1.2.2 林间观察方法

在白骨壤林区选择样地,进行室外饲养,用纱网套住整个枝条,将幼虫放在网内饲养,定期换有新鲜叶片的枝条,观察并记录室外幼虫不同滩位和不同高度植株上的虫口情况。虫口密度调查采用平行线取样法取样20株。在不同滩位分别设置10 m × 10 m的典型样方,在样方内采用5点取样法抽取20株白骨壤,每株白骨壤随机抽取20个小枝调查并记录虫口数量。

同一植株不同水平位置广州小斑螟密度的调查:在林中选取相对孤立的较高大白骨壤植株20株,调查8个方向上虫口密度,每个方向调查1个小枝来统计虫口数量,调查高度均选定为1.5m。同一植株不同垂直位置虫口密度的调查:分别在合浦的沙田、北海的垌尾和防城港的竹山的白骨壤林做调查,每处选取较为典型样株20株,每株区分上中下3部分,每部分重复选取5个小枝来统计虫口密度。

调查数据均采用dps5.0统计软件来进行相关的统计分析。

2 结果与分析

2.1 不同滩位的虫口密度

由图1可知,在不同调查点不同滩位的虫口密度差异性规律不同,其中在沙田,内滩的虫口密度显著高于中滩和外滩;在新村,中滩的虫口密度高于内滩,在垌尾内滩和中滩的虫口差异不明显;在渔舟坪,则是中滩的

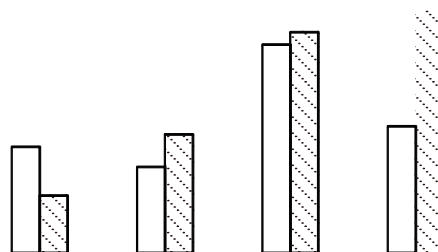


图1 不同滩位广州小斑螟虫口数

Fig. 1 The endanger situation of *O. cantonella* in different location of beach

虫口密度显著高于内滩和外滩。

2.2 同一植株不同水平位置虫口情况调查分析

以上分析可知,广州小斑螟在单株上的不同方位虫口密度差异显著,正南方向虫口密度最高,正西、正北虫口密度最低。

表 1 不同方位虫口密度多重比较

Table 1 The multiple comparisons of population density in different azimuth

处理 Treat	调查枝数 The number of surveying branches	虫口密度(虫/小枝) Population density	方差 Variance	5% 显著水平* 5% significance level
正南	24	0.875	1.2446	a
西北	24	0.75	0.8913	ab
正东	16	0.625	0.65	abc
东北	22	0.5	0.3571	abc
西南	21	0.4762	0.3619	abc
东南	15	0.4	0.4	abc
正西	25	0.28	0.3567	bc
正北	20	0.2	0.1684	c

* 不同字母间表示差异显著

2.3 同一植株不同垂直位置害虫情况调查分析

广州小斑螟虫口密度在单株白骨壤的中上部明显高于下部,这可能是受当地潮汐的影响,白骨壤下部受潮汐的淹没时间和机会要远大于中上部,而在中上部,尤其是上部只有在潮水较高时才会被淹到。但在整株白骨壤的树冠层均要高于高潮线时,这种分布规律就不明显,如垌尾。从虫口密度上看,中部高于上部,从白骨壤叶片的受害情况看,上部要高于下部,这可能有两个原因:一是树冠上层的广州小斑螟幼虫更容易被胡蜂和马蜂等捕食性天敌所捕食;二是广州小斑螟一般是在傍晚、清晨和晚上到树冠上层取食,而白天则退回到树冠的里层、中下层。

2.4 淹水试验

由图 3 可知,广州小斑螟水淹 6h 的死亡率为 0,水淹 8h 后死亡率才明显上升,水淹 12h 的死亡率达 100%,数据表明广州小斑螟幼虫较耐水淹,适合潮间带的潮涨潮落的环境。

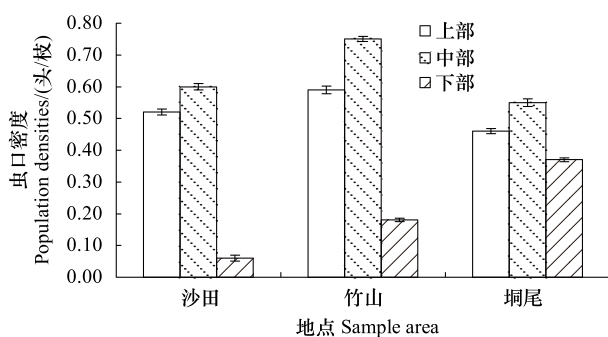


图 2 不同部位广州小斑螟幼虫虫口密度

Fig. 2 The endanger situation of *O. cantonella* in different position

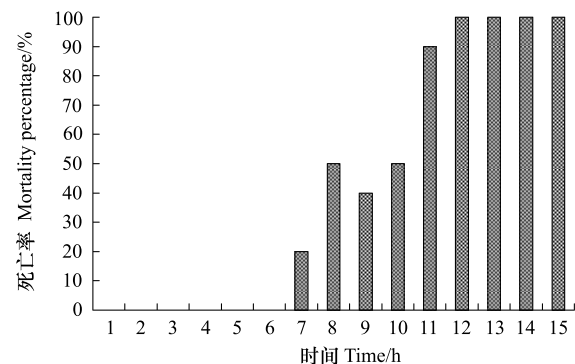


图 3 广州小斑螟耐海水浸泡试验

Fig. 3 The resistance to the seawater tests of *O. cantonella*

2.5 取食量试验

通过叶碟法测定的广州小斑螟 3、4、5 龄幼虫的取食量如图 4 所示,老熟幼虫的取食量最大,4 龄和 5 龄的取食量占据了整个幼虫期的大部分,是广州小斑螟为害最大的虫态,应注重对 4 龄幼虫前的防治。

2.6 海水水温与虫害的关系

图 5 是北海和防城港的多年的月平均水温,从图中可以看出北海市区的月均温要高于防城港的,特别是前 1—7 月。月均温不同,不同地点同一时间广州小斑螟的生长所累积的有效积温就有所不同,世代发育进程

也会有所差异。如表 2 所示 2007 年 5 月 14 号,在北海沙田调查到广州小斑螟蛹约占全部虫态的 50%,而同年 5 月 18 号在防城港渔舟坪,所调查的数据为 47.1%。总体上来说,防城港的广州小斑螟的总体世代发育要滞后北海 5—7d。

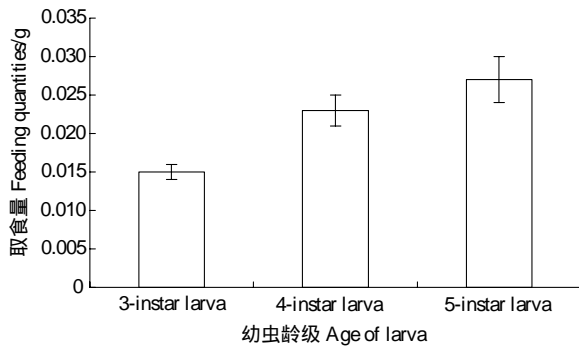


图 4 广州小斑螟不同虫龄取食量试验

Fig. 4 The feeding amount tests of *O. cantonella* among in different age

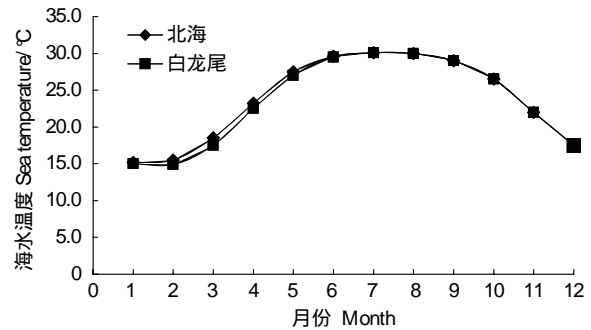


图 5 海水温度变化曲线图

Fig. 5 The variation curve of seawater temperature

表 2 不同地区广州小斑螟世代发育

Table 2 The generation development of *O. cantonella* in different place

地点 Sites	时间 Time	蛹 Pupa	幼虫 Larva	蛹所占比率% The percentage of pupae
合浦沙田	2007 年 5 月 8 日	0	12	0
	2007 年 5 月 10 日	13	30	30.2
	2007 年 5 月 11 日	32	31	50.8
	2007 年 5 月 12 日	20	25	44.4
	2007 年 5 月 13 日	30	28	51.7
	2007 年 5 月 14 日	25	25	50.0
防城港渔舟坪	2007 年 5 月 18 日	19	18	47.1%
	2007 年 5 月 20 日	21	19	48.6%

3 讨论

通过本次研究发现,在不同调查点不同滩位的虫口密度差异性规律不同,影响广州小斑螟种群变动的因素中,不同地点相同滩位差异较大,说明种群变动受到其他因素的影响较大。

在同一株数不同方位调查发现,正南方向虫口密度最高,正西、正北虫口密度最低,说明风向和海水的涨落导致虫口密度具有一定的规律性。水淹试验 8h 死亡率明显升高,说明该时长已经接近昆虫的致死时效。

References:

- [1] Liu W A, Fan H Q. Major Pests and Their Natural Enemies of Mangroves in Guangxi, China. Nanning: Guangxi Science and Technology Press, 2009: 11-11.
- [2] Xu J X, Lin G X, Qiu H X, Lin M S, Huang M Y, Lu X, Chen R P, Lai J C, Liu H J, Chen H S, Zhao D Y, Huang L S. Study on biology and population of *Oligochroa cantonella* in community of *Avicennia marina* in Guangdong. Guangdong Forestry Science and Technology, 2008, 24(3): 8-16.
- [3] Ding M. Studies on Insect Community and Tactics of Integrated Major Pest Management in Mangrove Forests in Fujian Province. Fuzhou: Fujian University of Agriculture and Forestry, 2007.
- [4] Fan H Q. Mangrove: the Guard of the Environmental Protection of the Coast. Nanning: Guangxi Science and Technology Press, 2000.
- [5] Fan H Q, Qiu G L. Insect pests of *Avicennia marina* mangroves along the coast of Beibu Gulf in China and the research strategies. Guhaia, 2004, 24(6): 558-562.

参考文献:

- [1] 刘文爱, 范航清. 广西红树林主要害虫及其天敌. 南宁: 广西科学技术出版社, 2009: 11-11.
- [2] 徐家雄, 林广旋, 邱焕秀, 林明生, 黄木养, 陆旭, 陈瑞屏, 赖锦超, 刘宏杰, 陈惠胜, 赵丹阳, 黄理顺. 广东白骨壤群落上的广州小斑螟生物学特性及种群数量消长规律研究. 广东林业科技, 2008, 24(3): 8-16.
- [3] 丁瑜. 福建红树林昆虫群落及主要害虫综合治理技术研究. 福州: 福建农林大学, 2007.
- [4] 范航清. 红树林: 海岸环保卫士. 南宁: 广西科学技术出版社, 2000.
- [5] 范航清, 邱广龙. 中国北部湾白骨壤红树林的虫害与研究对策. 广西植物, 2004, 24(6): 558-562.

ACTA ECOLOGICA SINICA Vol. 31, No. 23 December, 2011 (Semimonthly)

CONTENTS

Satellite-based modelling light use efficiency of alpine meadow along an altitudinal gradient FU Gang, ZHOU Yuting, SHEN Zhenxi, et al (6989)

Changes in the concentrations of airborne *Picea schrenkiana* pollen in response to temperature changes in the Tianshan Mountain area PAN Yanfang, YAN Shun, MU Guijin, et al (6999)

Primary production in the Bay of Bengal during spring intermonsoon period LIU Huaxue, KE Zhixin, SONG Xingyu, et al (7007)

Effect of rainfall regimes on the decomposition rate of yak dung in an alpine meadow of northwest Sichuan Province, China WU Xinwei, LI Guoyong, SUN Shucun (7013)

SOFM-based nutrient cycling classification of forest ecosystems in the Loess Plateau CHEN Kai, LIU Zengwen, LI Jun, et al (7022)

Characterization of the responses of photosynthetic and chlorophyll fluorescence parameters to water stress in seedlings of six provenances of Chinese Pine (*Pinus tabulaeformis* Carr.) WANG Yan, CHEN Jianwen, et al (7031)

Effect of silicon supply on Tall Fescue (*Festuca arundinacea*) growth under the salinization conditions LIU Huixia, GUO Xinghua, GUO Zhenggang (7039)

Effects of high-temperature stress on physiological characteristics of leaves of *Simmondsia Chinensis* seedlings from different provenances HUANG Weiwei, ZHANG Niannian, HU Tingxing, et al (7047)

Soil moisture dynamics of water and soil conservation forest on the Loess Plateau ZHANG Jianjun, LI Huimin, XU Jiajia (7056)

The distribution of male and female *Populus cathayana* populations along an altitudinal gradient WANG Zhifeng, XU Xiao, LI Xiaofeng, et al (7067)

Analysis on the characteristics of macrobenthic community in the North-west Daya Bay of South China Bay in spring DU Feiyan, LIN Qin, JIA Xiaoping, et al (7075)

The effects of season and environmental factors on community structure of planktonic copepods in Zhanjiang Bay, China ZHANG Caixue, GONG Yuyan, WANG Xuefeng, et al (7086)

Population genetic structure of *Pneumatophorus japonicus* in the Taiwan Strait ZHANG Liyan, SU Yongquan, WANG Hangjun, et al (7097)

Seasonal variation of nitrogen and phosphorus in Miju River and Lake Erhai and influencing factors YU Chao, CHU Jinyu, BAI Xiaohua, et al (7104)

Population dynamics and production of *Bellamyia aeruginosa* (Reeve) (Mollusca: Viviparidae) in artificial lake for transgenic fish, Wuhan XIONG Jing, XIE Zhicai, JIANG Xiaoming, et al (7112)

Carbon, nitrogen and phosphorus ecological stoichiometric ratios among live plant-litter-soil systems in estuarine wetland WANG Weiqi, XU Linglin, ZENG Congsheng, et al (7119)

Effects of EDTA on growth and lead-zinc accumulation in maize seedlings grown in amendment substrates containing lead-zinc tailings and soil WANG Hongxin, HU Feng, XU Xinwang, et al (7125)

Effects of different coated controlled-release urea on soil ammonia volatilization in farmland LU Yanyan, SONG Fupeng (7133)

Effects of ridge planting on the photosynthetic characteristics and yield of summer maize in high-yield field MA Li, LI Chaohai, FU Jing, et al (7141)

Effect of timing of DCD application on nitrous oxide emission during wheat growing period JI Yang, YU Jia, MA Jing, et al (7151)

The role of the fertilizing with nitrogen, calcium and sodium chloride in winter wheat leaves adaptation to freezing-thaw stress LIU Jianfang, ZHOU Ruilian, ZHAO Mei, et al (7161)

Environment impact assessment of organic and conventional soybean production with LCA method in China Northeast Plain LUO Yan, QIAO Yuhui, WU Wenliang (7170)

Effects of selenium added to soil on physiological indexes in flue-cured tobacco XU Zicheng, SHAO Huifang, SUN Shuguang, et al (7179)

Influence of different planting patterns on field microclimate effect and yield of peanut (*Arachis hypogea* L.) SONG Wei, ZHAO Changxing, WANG Yuefu, et al (7188)

Rapid cold hardening of Western flower thrips, *Frankliniella occidentalis*, and its ecological cost LI Hongbo, SHI Liang, WANG Jianjun, et al (7196)

- Effects of temperature on body color in *Sitobion avenae* (F.) DENG Mingming, GAO Huanhuan, LI Dan, et al (7203)
- Development and reproduction of *Bemisia tabaci* biotype B on wild and cultivated tomato accessions
 GAO Jianchang, GUO Guangjun, GUO Yanmei, et al (7211)
- Study on ecological water demand based on assessment of ecosystem disturbance degree in the Baiyangdian Wetland
 CHEN He, YANG Ying, YU Shiwei, et al (7218)
- Emergy-based analysis of two chicken farming systems; a perspective of organic production model in China
 HU Qihong, ZHANG Lixiao, WANG Changbo (7227)
- Mathematical model design of time-effect relationship analysis about the inhibition of four eighteen-carbon fatty acids on toxic
Microcystis aeruginosa HE Zongxiang, ZHANG Tingting (7235)
- Enrichment of heavy metals in the seagrass bed of Liusha Bay XU Zhanzhou, ZHU Aijia, CAI Weixu, et al (7244)
- A gradient analysis of urban architecture landscape pattern based on QuickBird imagery
 ZHANG Peifeng, HU Yuanman, XIONG Zaiping, et al (7251)
- Landscape spatial heterogeneity is associated with urbanization; an example from Yangtze River in Jiangsu Province
 CHE Qianjin, CAO Youhui, YU Lu, et al (7261)
- CVM for Taihu Lake based on ecological functions of wetlands restoration, and ability to pay and willingness to pay studies
 YU Wenjin, XIE Jian, ZOU Xinqing (7271)
- Review and Monograph**
- Progress in research on the marine microbial loop in the Arctic Ocean HE Jianfeng, CUI Shikai, ZHANG Fang, et al (7279)
- Research progress in the eco-environmental effects of urban green spaces
 SU Yongxian, HUANG Guangqing, CHEN Xiuzhi, et al (7287)
- Source, exposure characteristics and its environmental effect of heavy metals in urban surface dust
 FANG Fengman, LIN Yuesheng, WANG Haidong, et al (7301)
- Scientific Note**
- Spatial structures of soilcarbon and nitrogen of China fir and Masson pine mixed forest in the Three Gorges Reservoir Areas
 LIN Yinghua, WANG Laifa, TIAN Xiaokun, et al (7311)
- The relationship between *Oligochroa cantonella* Caradja and environmental factors LIU Wenai, FAN Hangqing (7320)

2009 年度生物学科总被引频次和影响因子前 10 名期刊*

(源于 2010 年版 CSTPCD 数据库)

排序 Order	期刊 Journal	总被引频次 Total citation	排序 Order	期刊 Journal	影响因子 Impact factor
1	生态学报	11764	1	生态学报	1.812
2	应用生态学报	9430	2	植物生态学报	1.771
3	植物生态学报	4384	3	应用生态学报	1.733
4	西北植物学报	4177	4	生物多样性	1.553
5	生态学杂志	4048	5	生态学杂志	1.396
6	植物生理学通讯	3362	6	西北植物学报	0.986
7	JOURNAL OF INTEGRATIVE PLANT BIOLOGY	3327	7	兽类学报	0.894
8	MOLECULAR PLANT	1788	8	CELL RESEARCH	0.873
9	水生生物学报	1773	9	植物学报	0.841
10	遗传学报	1667	10	植物研究	0.809

★《生态学报》2009 年在核心版的 1964 种科技期刊排序中总被引频次 11764 次,全国排名第 1;影响因子 1.812,全国排名第 14;第 1—9 届连续 9 年入围中国百种杰出学术期刊;中国精品科技期刊

编辑部主任 孔红梅

执行编辑 刘天星 段 靖

生态学报

(SHENGTAI XUEBAO)

(半月刊 1981 年 3 月创刊)

第 31 卷 第 23 期 (2011 年 12 月)

ACTA ECOLOGICA SINICA

(Semimonthly, Started in 1981)

Vol. 31 No. 23 2011

编 辑 《生态学报》编辑部
地址:北京海淀区双清路 18 号
邮政编码:100085
电话:(010)62941099
www.ecologica.cn
shengtaixuebao@rcees.ac.cn

Edited by Editorial board of
ACTA ECOLOGICA SINICA
Add:18, Shuangqing Street, Haidian, Beijing 100085, China
Tel:(010)62941099
www.ecologica.cn
Shengtaixuebao@rcees.ac.cn

主 编 冯宗炜
主 管 中国科学技术协会
主 办 中国生态学会
中国科学院生态环境研究中心
地址:北京海淀区双清路 18 号
邮政编码:100085

Editor-in-chief FENG Zong-Wei
Supervised by China Association for Science and Technology
Sponsored by Ecological Society of China
Research Center for Eco-environmental Sciences, CAS
Add:18, Shuangqing Street, Haidian, Beijing 100085, China

出 版 科 学 出 版 社
地址:北京东黄城根北街 16 号
邮政编码:100717

Published by Science Press
Add:16 Donghuangchenggen North Street,
Beijing 100717, China

印 刷 北京北林印刷厂
发 行 科 学 出 版 社
地址:东黄城根北街 16 号
邮政编码:100717
电话:(010)64034563
E-mail:journal@espg.net

Printed by Beijing Bei Lin Printing House,
Beijing 100083, China
Distributed by Science Press
Add:16 Donghuangchenggen North
Street, Beijing 100717, China
Tel:(010)64034563
E-mail:journal@espg.net

订 购 全国各地邮局
国外发行 中国国际图书贸易总公司
地址:北京 399 信箱
邮政编码:100044

Domestic All Local Post Offices in China
Foreign China International Book Trading
Corporation
Add:P. O. Box 399 Beijing 100044, China

广告经营
许 可 证 京海工商广字第 8013 号



ISSN 1000-0933
CN 11-2031/Q

国内外公开发行

国内邮发代号 82-7

国外发行代号 M670

定价 70.00 元