



生态学报

ACTA ECOLOGICA SINICA

第38卷 第18期 Vol. 38 No. 18 2018

ISSN 1000-0933 CN 11-2031/Q

第十七届中国生态学大会专辑



中国生态学学会
中国科学院生态环境研究中心
万方数据

主办



科学出版社
Science Press

出版

ACTA ECOLOGICA SINICA Vol.38, No.18 September, 2018 (Semimonthly)

CONTENTS

Review and Monograph

- Patterns and influencing factors of traits in forest ecosystems: Synthesis and perspectives on the synthetic investigation from the north-east transect of eastern China (NETEC) HE Nianpeng, ZHANG Jiahui, LIU Congcong, et al (6360)
- Effects of shale gas development on vegetation and soil: a review CHEN Hongkun, DU Xianyu, ZHANG Xinyu, et al (6383)

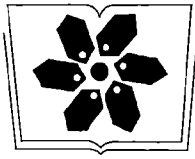
Ecosystem Services and Management Special Column

- Coupling correlation analysis of ecosystem services and livelihoods in the perspective of targeted poverty alleviation ZHOU Lilei, GUAN Dongjie, YUAN Xingzhong (6391)
- The coupling relationship between ecosystem services and residents' income and its impact factors: a case study of the Lashihai basin in Lijiang, Yunnan HU Lei, WU Jian, LI Haiping (6402)
- Effects of landscape spatial heterogeneity on the generation and provision of ecosystem services LIU Luyi, BIAN Ziqi, DING Shengyan (6412)
- Ecosystem services demand assessment regarding disaster vulnerability and supply-demand spatial matching DONG Xiaonan, XIE Miaomiao, ZHANG Qinya, et al (6422)
- Evaluation of the maintenance service values of the ecosystem diversity of marine protected areas and the diversity of important marine species in Sanya coastal waters based on the contingent valuation method HAO Linhua, CHEN Shang, WANG Ertao, et al (6432)
- Study on the evolution of urban ecosystem patterns in Macao MENG Nan, HAN Baolong, WANG Haiyang, et al (6442)
- Carbon emission accounting for the transition of public buses from gasoline to electricity in Hangzhou City, China YING Zimin, WU Xu, YANG Wu (6452)
- Analysis of emergy ecological footprint change of coastal rapid urbanization areas MA He, ZHANG Tianhai, LUO Hongsen, et al (6465)
- Evaluation of the species protected value of nature reserves in northeast China FAN Jian, PENG Yangjing, XING Shaohua, et al (6473)
- Divergent behavioral responses of sympatric species to grazing disturbance WANG Xiao, HOU Jin, ZHANG Jindong, et al (6484)

Soil Ecology Special Column

- Peatland development and carbon dynamics histories of Zoige peatlands for 15000 years LIU Lijuan, LIU Xinwei, JU Peijun, et al (6493)
- Effects of nitrogen additions on the temperature sensitivities of soil organic carbon mineralization rates and enzyme kinetic parameters in Chinese fir plantations DONG Qingxin, ZHANG Xinyu, WANG Huimin, et al (6502)
- Simulation of a soil water retention curve of typical soil and water conservation engineering measures in the Loess hilly watershed YU Yang, WEI Wei, CHEN Liding, et al (6511)
- Effects of litter addition on soil humification during freeze-thaw cycles in a subalpine forest WEI Xinyu, YANG Wanqin, ZHANG Li, et al (6521)
- Characterization of the soil and leaf C, N, and P stoichiometry of poplar plantations of three different stand ages in Dongting Lake wetland, China JING Lei, ZHOU Yan, LÜ Cai, et al (6530)
- Soil physiochemical properties and diversity of herbaceous plants dynamic on the different ages mixed forests of *Populus × Euramerica* 'Neva' and *Robinia pseudoacacia* in coastal saline-alkali area WANG Shumei, PANG Yuanxiang, SONG Aiyun, et al (6539)
- Effects of different soil thickness, water and planting patterns on the litter mass loss and stoichiometry characteristics of two herbs in the karst regions ZHAO Yajie, ZHANG Jing, SONG Haiyan, et al (6549)
- Effects of recycling straw of different winter covering crops on rhizospheric microbial community functional diversity in a double-cropped paddy field TANG Haiming, XIAO Xiaoping, LI Chao, et al (6559)
- Characteristics of soil phosphorus fractions and microbial communities in *Pinus taiwanensis* Hayata forests at different altitudes in a subtropical region of China ZENG Xiaomin, FAN Yuexin, LIN Kaimiao, et al (6570)

- Stoichiometric characteristics of soil nutrient elements and its influencing factors in typical karst rocky desertification ecosystems, Southwest China WANG Linjiao, WANG Pan, SHENG Maoyin (6580)
- Responses of soil microbial biomass to different habitat factors in the chenier of the Yellow River Delta FU Zhanyong, SUN Jingkuan, LI Chuanrong, et al (6594)
- Effects of multiple winter cropping on soil organic carbon and double-cropping rice yield in the south of China WANG Shubin, WANG Lixian, YANG Wenting, et al (6603)
- Applying dual stable isotopes and a MixSIAR model to determine root water uptake of winter wheat DU Junshan, MA Ying, HU Xiaonong, et al (6611)
- Isolation and identification of the *Epichloë* endophyte from *Bothriochloa ischaemum* and its heavy metal tolerance JIA Tong, WANG Ruihong, CAO Miaowen (6623)
- Effects of habitat heterogeneity and ortet density on the invasiveness of *Spartina alterniflora* ZHAO Zhiyuan, YUAN Lin, LI Wei, et al (6632)
- Spatial pattern of herbaceous plant species diversity and its changes due to simulated warming in the forest community of the Luliang Mountains YANG Xiaoyan, ZHANG Shixiong, WEN Jing, et al (6642)
- Vegetation type classification and fractional vegetation coverage estimation for an open elm (*Ulmus pumila*) woodland ecosystem during a growing season based on an unmanned aerial vehicle platform coupled with decision tree algorithms HAN Dong, WANG Haozhou, ZHENG Bangyou, et al (6655)
- Biomass allocation relationships in the grass layer in alpine shrubland ecosystems on the Tibetan Plateau NIE Xiuqing, XIONG Feng, LI Changbin, et al (6664)
- Effects of warming on the biomass allocation and allometric growth of the invasive shrub *Lantana camara* ZHANG Qiaoying, PENG Shaolin (6670)
- Hyperspectral response characteristics and chlorophyll content estimation of *Phyllostachys violascens* leaves under drought stress ZHANG Wei, WANG Xinmei, PAN Qingmei, et al (6677)
- Spatial and temporal patterns of species diversity of subalpine meadows in the Lvliang Mountains, Shanxi Province ZHANG Shixiong, YANG Xiaoyan, WEN Jing, et al (6685)
- Dynamics of litterfall in different forest types in the Yimeng mountainous area GUAN Mengdi, LI Jun, ZHANG Guangna, et al (6694)
- Energy balance characteristics of a natural oak forest (*Quercus aliena*) at a transitional area from a subtropical to warm temperate climate, China NIU Xiaodong, LIU Xiaojing, LIU Shirong, et al (6701)
- Variation of leaf stomatal traits in *Quercus* species along the altitudinal gradient in Taibai Mountain, China WEN Jingwen, CHEN Haoxuan, TENG Yiping, et al (6712)
- Carbon storage and its allocation pattern in *Armeniaca vulgaris* plantations at different ages on the eastern slope of Taihang Mountain SHEN Huitao, ZHANG Tao, MA Wencai, et al (6722)
- Effects of drought on root architecture and non-structural carbohydrate of *Cunninghamia lanceolata* YANG Zhenya, ZHOU Benzhi, CHEN Qingbiao, et al (6729)
- Patterns of eco-enzymatic stoichiometry in mid-subtropical forest regeneration YUAN Ping, ZHOU Jiacong, ZHANG Qiufang, et al (6741)
- Effect of temperature and food supply on the asexual reproduction of the scyphozoan *Nemopilema nomurai* in autumn SUN Ming, XING Qinwang, WANG Jiahan, et al (6749)
- Study on the niche and differentiation of major nekton species in the Zhoushan Changbai sea area QIU Jinjin, WANG Yongxue, LI Tiejun, et al (6759)
- Assimilation and release of the ingested carbon of phytoplankton *Chlorella* sp. by the marine zooplanktonic rotifer *Brachionus plicatilis* LIU Qingxia, ZHOU Linbin, WU Yun, et al (6768)
- Correlation between shell-body mass ratio and hydrostatic settling characteristics of mollusc species LUO Du, WANG Xuejie, XU Meng, GU Dangen, et al (6778)



中国科学院科学出版基金资助出版

生态学报

(SHENGTAI XUEBAO)

第 38 卷 第 18 期

2018 年 9 月 (半月刊)

目 次

专论与综述

森林生态系统性状的空间格局与影响因素研究进展——基于中国东部样带的整合分析..... 何念鹏, 张佳慧, 刘聪聪, 等 (6359)

页岩气开发对植被和土壤的影响研究进展..... 陈宏坤, 杜显元, 张心昱, 等 (6383)

生态系统服务与生态管理

精准扶贫视角下生态系统服务与贫困人口生计耦合关联分析 周李磊, 官冬杰, 袁兴中 (6391)

生态系统服务与居民收入的耦合关系及影响因素——以丽江拉市海流域为例..... 胡 蕾, 吴 健, 李海萍 (6402)

景观空间异质对生态系统服务形成与供给的影响 刘绿怡, 卞子元, 丁圣彦 (6412)

承灾脆弱性视角下的生态系统服务需求评估及供需空间匹配..... 董潇楠, 谢苗苗, 张覃雅, 等 (6422)

基于条件价值法评估三亚海域生态系统多样性及物种多样性的维持服务价值..... 郝林华, 陈 尚, 王二涛, 等 (6432)

澳门城市生态系统格局变化研究..... 孟 楠, 韩宝龙, 王海洋, 等 (6442)

杭州市公交车油改电项目碳排放效益核算 应紫敏, 吴 旭, 杨 武 (6452)

沿海快速城市化地区能值生态足迹变化分析..... 马 赫, 张天海, 罗宏森, 等 (6465)

我国东北三省自然保护区物种保护价值评估..... 樊 简, 彭杨靖, 邢韶华, 等 (6473)

同域分布的珍稀野生动物对放牧的行为响应策略..... 王 晓, 侯 金, 张晋东, 等 (6484)

土壤生态

15000 年以来若尔盖高原泥炭地发育及其碳动态 刘利娟, 刘欣慰, 鞠佩君, 等 (6493)

氮添加对杉木林土壤有机碳矿化速率及酶动力学参数温度敏感性的影响..... 董清馨, 张心昱, 王辉民, 等 (6502)

黄土丘陵区小流域典型造林整地工程土壤水分特征曲线模拟..... 于 洋, 卫 伟, 陈利顶, 等 (6511)

冻融环境下凋落叶添加对亚高山森林土壤腐殖化程度的影响..... 卫芯宇, 杨万勤, 张 丽, 等 (6521)

洞庭湖湿地 3 个林龄杨树人工林叶与土壤碳氮磷生态化学计量特征..... 靖 磊, 周 延, 吕 偲, 等 (6530)

基于林龄的滨海盐碱地杨树刺槐混交林土壤理化性质及草本植物多样性动态..... 王树梅, 庞元湘, 宋爱云, 等 (6539)

不同土壤厚度、水分和种植方式对喀斯特两种草本凋落物分解质量损失和化学计量特征的影响 赵雅洁, 张 静, 宋海燕, 等 (6549)

冬季覆盖作物秸秆还田对双季稻田根际土壤微生物群落功能多样性的影响..... 唐海明, 肖小平, 李 超, 等 (6559)

亚热带不同海拔黄山松林土壤磷组分及微生物特征..... 曾晓敏, 范跃新, 林开森, 等 (6570)

..... 唐海明, 肖小平, 李 超, 等 (6559)

..... 曾晓敏, 范跃新, 林开森, 等 (6570)

..... 曾晓敏, 范跃新, 林开森, 等 (6570)

西南喀斯特典型石漠化生态系统土壤养分生态化学计量特征及其影响因素..... 王霖娇,汪 攀,盛茂银 (6580)

黄河三角洲贝壳堤土壤微生物生物量对不同生境因子的响应..... 付战勇,孙景宽,李传荣,等 (6594)

南方不同“冬种+双季稻”种植模式对土壤有机碳和作物产量的影响 王淑彬,王礼猷,杨文亭,等 (6603)

基于双稳定同位素和 MixSIAR 模型的冬小麦根系吸水来源研究 杜俊杉,马 英,胡晓农,等 (6611)

白羊草 *Epichloë* 属内生真菌的分离鉴定及其重金属耐受性 贾 彤,王瑞宏,曹苗文 (6623)

生境异质性及源株密度对互花米草入侵力的影响..... 赵志远,袁 琳,李 伟,等 (6632)

吕梁山森林群落草本层植物物种多样性的空间格局及其对模拟增温的响应..... 杨晓艳,张世雄,温 静,等 (6642)

基于无人机和决策树算法的榆树疏林草原植被类型划分和覆盖度生长季动态估计..... 韩 东,王浩舟,郑邦友,等 (6655)

青藏高原高寒灌丛生态系统草本层生物量分配格局..... 聂秀青,熊 丰,李长斌,等 (6664)

增温对入侵植物马缨丹生物量分配和异速生长的影响..... 张桥英,彭少麟 (6670)

干旱胁迫下雷竹叶片叶绿素的高光谱响应特征及含量估算..... 张 玮,王鑫梅,潘庆梅,等 (6677)

山西吕梁山亚高山草甸物种多样性的时空变化格局..... 张世雄,杨晓艳,温 静,等 (6685)

沂蒙山区不同森林类型凋落物量及其动态特征..... 管梦娣,李 君,张广娜,等 (6694)

亚热带-暖温带过渡区天然栎林的能量平衡特征 牛晓栋,刘晓静,刘世荣,等 (6701)

太白山栎属树种气孔特征沿海拔梯度的变化规律..... 温婧雯,陈昊轩,滕一平,等 (6712)

太行山东坡不同林龄杏树林碳储量及其分配特征..... 沈会涛,张 韬,马文才,等 (6722)

干旱对杉木幼苗根系构型及非结构性碳水化合物的影响..... 杨振亚,周本智,陈庆标,等 (6729)

中亚热带不同森林更新方式生态酶化学计量特征..... 袁 萍,周嘉聪,张秋芳,等 (6741)

秋季降温期水温 and 饵料量对沙蚕无性繁殖的影响..... 孙 明,邢勤旺,王佳晗,等 (6749)

舟山长白海域主要游泳动物生态位及其分化研究..... 求锦津,王咏雪,李铁军,等 (6759)

褶皱臂尾轮虫 *Brachionus plicatilis* 摄食小球藻 *Chlorella* sp. 的碳同化与碳排放 刘庆霞,周林滨,毋 赞,等 (6768)

贝类壳-体质量比和静水沉降特性的相关性 罗 渡,汪学杰,徐 猛,等 (6778)

期刊基本参数:CN 11-2031/Q * 1981 * m * 16 * 428 * zh * P * ¥90.00 * 1510 * 43 * 2018-09



封面彩图提供: 刘国华 中国科学院生态环境研究中心 E-mail: ghliu@rcees.ac.cn

《生态学报》2018 年征订启事

《生态学报》是由中国科学技术协会主管,中国生态学学会、中国科学院生态环境研究中心共同主办的生态学高级专业学术期刊,创刊于 1981 年,报道生态学领域前沿理论和原始创新性研究成果。坚持“百花齐放,百家争鸣”的方针,依靠和团结广大生态学科工作者,探索生态学奥秘,为生态学基础理论研究搭建交流平台,促进生态学研究深入发展,为我国培养和造就生态学科人才和知识创新服务、为国民经济建设和发展服务。

《生态学报》主要报道生态学重要基础理论和应用研究的原始创新性科研成果。主要刊载文章类型有:研究综述;研究论文;学术信息与动态,同时也刊登生态学新理论、新方法、新技术介绍;新书评介及开放实验室介绍等。

《生态学报》为半月刊,大 16 开本,280 页,国内定价 90 元/册,全年定价 2160 元。

国内邮发代号:82-7,国外邮发代号:M670

标准刊号:ISSN 1000-0933 CN 11-2031/Q

全国各地邮局均可订阅,也可直接与编辑部联系购买。欢迎广大科技工作者、科研单位、高等院校、图书馆等订阅。

通讯地址:100085 北京海淀区双清路 18 号 电 话:(010)62941099; 62843362

E-mail: shengtaixuebao@rcees.ac.cn 网 址: www.ecologica.cn

执行副主编 孔红梅 责任编辑 刘 昕 全 元 编辑 朱晶莹 宗 静 彭小琼

生 态 学 报
(SHENGTAI XUEBAO)
(半月刊 1981 年 3 月创刊)
第 38 卷 第 18 期 (2018 年 9 月)

ACTA ECOLOGICA SINICA
(Semimonthly, Started in 1981)
Vol. 38 No. 18 (September, 2018)

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	傅伯杰	Editor-in-chief	FU Bojie
主 管	中国科学技术协会	Supervised by	China Association for Science and Technology
主 办	中国生态学学会 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	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	北京宝昌彩色印刷有限公司	Printed by	Beijing Baochang Color Printing Co.,Ltd, Beijing 100094,China
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@cspg.net	Distributed by	Science Press Add:16 Donghuangchenggen North Street,Beijing 100717,China Tel:(010)64034563 E-mail:journal@cspg.net
订 购	全国各地邮局	Domestic	All Local Post Offices in China
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	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		

