昆虫学报
ACTA ENTOMOLOGICA SINICA
ISSN 0454-6296
CN 11-1832/Q
主办：中国科学院动物研究所
中 国 昆 虫 学 会

昆虫学报 » 2013, Vol. 56 » Issue (11): 1314-1323 DOI:

研究论文

云南橡胶林和天然次生林枯落物层蚂蚁物种多样性、 群落结构差异及指示种

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Species diversity, community structure difference and indicator species of leaf-litter ants in rubber plantations and secondary natural forests in Yunnan, southwestern China

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全文: PDF (3054 KB) HTML (1 KB) 输出: BibTeX | EndNote (RIS) 背景资料

摘要 橡胶树*Hevea brasiliensis*是云南省重要的经济林木， 但对其生态服务功能尚存在争议。本研究以天然次生林为对照， 使用Winkler法对橡胶林枯落物层蚂蚁进行初步研究， 探讨橡胶林枯落物层蚂蚁的生态状况。于2012年10月和2013年4月采用Winkler袋法调查了云南省绿春县大黑山乡橡胶林和牛孔乡天然次生林枯落物层蚂蚁群落的物种多样性、 群落结构差异及指示种。结果表明： 橡胶林枯落物层蚂蚁多度（转换后）、 物种丰富度*S*和ACE值显著低于无干扰的天然次生林（$P<0.05$）； 蚂蚁多度（转换后）显著低于有干扰的天然次生林（$P<0.05$）， 而物种丰富度*S*和ACE值差异不显著。橡胶林枯落物层蚂蚁群落结构与两种天然次生林都不相似（$F=3.93$， $df=12$， $P<0.01$）。橡胶林中流浪种大头蚁属Pheidole的蚂蚁种类与天然次生林相比， 物种丰富度增加了100%。天然次生林枯落物层中蚂蚁指示种有3种， 分别为刘氏隆头蚁*Strumigenys lewisi*、 黄足厚结猛蚁*Pachycondyla luteipes*和女娲角腹蚁*Recurvidris nuwa*， 而橡胶林枯落物层中指示种仅为菱结大头蚁*Pheidole nodus*。枯落物层蚂蚁物种多样性与枯落物厚度呈显著正相关， 而枯落物盖度仅与蚂蚁多度（转换后）有相关性。结果说明， 橡胶林经过长期的经营管理， 生态环境趋于稳定， 对枯落物层蚂蚁群落具有一定的保护作用， 但与天然次生林相比， 蚂蚁多度（转换后）及群落结构仍显示出明显的不同。

关键词： 蚂蚁 橡胶林 天然次生林 枯落物层 物种多样性 指示种 群落结构 Winkler袋法

Abstract: Rubber trees (*Hevea brasiliensis*) are important economic forest trees in Yunnan province, China. But there are still different viewpoints on ecosystem services of rubber plantations. In order to reveal the differences of leaf-litter ant assemblages between rubber plantations and secondary natural forests, the species diversity, community structure differences and indicator species of ant communities in leaf litter were investigated by Winkler litter extraction in October 2012 and April 2013 in forests of the two types. The results showed that the abundance (transformed), species richness and ACE index of leaf-litter ants in rubber plantations were significantly lower than those in secondary natural forests without disturbance ($P<0.05$); ant abundance (transformed) in rubber plantations was significantly lower than that in disturbed secondary natural forests ($P<0.05$), however, the species richness and ACE index had no significant difference between them. There was no significant similarity of ant community composition between rubber plantations and secondary natural forests ($F=3.93$, $df=3$, $P<0.01$). The number of *Pheidole* species in rubber plantations increased by 100% compared with that in secondary natural forests. There were 3 indicator species (*Strumigenys lewisi*, *Pachycondyla luteipes* and *Recurvidris nuwa*) in leaf litter of secondary natural forests, but only one (*Pheidole nodus*) in leaf litter of rubber plantations. The ant species diversity in leaf litter had a significant positive correlation with the thickness of leaf litter, but only ant abundance (transformed) had a significant positive correlation with the coverage of leaf litter. The results suggest that after long time management, the rubber plantation ecosystem has the trend to be stabilized, and can protect ant community to some extent, while the ant community composition is very different from that in secondary natural forests.

Key words: Ants rubber plantation secondary natural forest leaf litter species diversity indicator species community structure Winkler extraction method

引用本文:

. 云南橡胶林和天然次生林枯落物层蚂蚁物种多样性、 群落结构差异及指示种[J]. 昆虫学报, 2013, 56(11): 1314-1323.

. Species diversity, community structure difference and indicator species of leaf-litter ants in rubber plantations and secondary natural forests in Yunnan, southwestern China[J]. ACTA ENTOMOLOGICA SINICA, 2013, 56(11): 1314-1323.

链接本文:

http://www.insect.org.cn/CN/ 或 http://www.insect.org.cn/CN/Y2013/V56/I11/1314

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