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研究论文

不同配置模式林分中光肩星天牛空间格局的地统计研究

王涛[1,2]，温俊宝[1,*]，骆有庆[1]，许志春[1]，Kari Heli vaara[3]

1.北京林业大学省部共建森林培育与保护教育部重点实验室，北京100083
2.北京市门头沟区林业工作站，北京102308
3.Department of Applied Biology, University Helsinki, Finland

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摘要 运用地统计学方法对光肩星天牛在新疆杨和复叶槭混交林（新复混交林）、合作杨纯林以及新疆杨与合作杨混交林（新合混交林）3种林分中的空间格局进行了研究。结果表明：刻槽、排粪孔和羽化孔在新复混交林和合作杨纯林中呈现较明显的空间聚集状态，而在新合混交林中则呈现完全的随机分布。新复混交林中，刻槽和排粪孔在林内的扩散趋势完全相反，即刻槽由林地周围向中心扩散，而排粪孔则由林地中心向四周扩散，这在一定程度上反映了光肩星天牛喜好产卵于刻槽较少，危害较轻的树上，而羽化孔在新复混交林中的分布数量较少，仅有几处聚集分布，由这些零星分布的聚集斑块向周围扩散；合作杨纯林中，由于林缘通风透光，合作杨生长状况较好，受害严重，从而导致枯死，最终失去对光肩星天牛的诱集作用，光肩星天牛刻槽、排粪孔和羽化孔由林地周围向中心扩散；而新合混交林中，刻槽、排粪孔和羽化孔在林内有多个聚集区域，并以此为中心向四周扩散，保持聚集和扩散平衡状态，从而表现为随机分布，这主要是由林内树种的配置情况所决定的。就不同配置树种的空间依赖性范围而言，刻槽和羽化孔在新复混交林内的空间依赖性范围要远远大于合作杨纯林，而排粪孔则远小于合作杨；就样方内的空间连续性强度而言，新复混交林中刻槽大于合作杨纯林，而排粪孔和羽化孔均小于合作杨纯林，这些均说明光肩星天牛危害在新复混交林内较集中，而在合作杨纯林内较分散。

关键词 光肩星天牛；不同配置模式林分；空间格局；地统计学

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Geostatitical study on the spatial pattern of *Anoplophora glabripennis* in three types of stands

WANG Tao[1,2], WEN Jun-Bao[1,*], LUO You-Qing[1], XU Zhi\|Chun[1], Kari Heli vaara[3]

1.The Key Laboratory for Silviculture and Conservation of Ministry of Education, Beijing Forestry University, Beijing 100083, China;
2.Mentougou Forestry Station, Beijing 102300, China;
3.Department of Applied Biology, University of Helsinki, Finland

Abstract The spatial pattern of *Anoplophora glabripennis*(Motschulsky) (Asian Longhorned Beetle, ALB) population was studied by geostatistical methods in three types of stands in China. The study stands represented: （1) a mixed stand of Populus alba var. pyramidalis and Acer negundo, (2) a pure stand of P.simonii×*P.nigra* var. italica, and (3) a mixed stand of P.alba var. pyramidalis and *P.simonii*×*P.nigra* var. italica. The incisions, frass holes and emergence holes all showed intense spatial aggregation in the mixed stand of P.alba var. pyramidalis and Acer negundo as well as in the pure stand of P.simonii×P.nigra var. italica, but in the mixed stand of P.alba var.pyramidalis and *P.simonii*×*P.nigra* var. italica they showed a random distribution. The spatial patterns of the incisions and frass holes were totally different in the mixed stand of Populus alba var. pyramidalis and Acer negundo: the incisions were spreading from the entire stand to the center of it, while the frass holes were spreading from the center of the stand to the entire stand. This result indicated that the beetles were capable of laying eggs on the trees with few incisions and with less damage. However, the number of the emergence holes was very low and showed only a few aggregation spots. The beetles spread from these spots to the entire stand. The trees in the edge of the pure stand of *P.simonii*×*P.nigra* var. italica were in good growth status but heavily damaged thus permeating light through their foliage. Gradually these trees withered, causing the incisions, frass hole

s and emergence holes to spread from the center of the stand to the entire stand. However, the in cisions, frass holes and emergence holes had several scattered spots of distribution in the mixed st and of P.alba var. pyramidalis and *P.simonii*×*P.nigra* var. italica. On the basis of aggregation an d scatter balance, they showed a random distribution, spreading from the center of the spot to th e entire stand. The stand types affected the spatial patterns of the incisions, frass holes and emerg ence holes. Regarding the range of spatial dependence of the different types of stands, the numbe r of incisions and emergence holes was higher in the mixed stand of *P.alba* var. pyramidalis an d Acer negundo. than in the pure stand of P.simonii×*P.nigra* var. italica, but the number of frass h oles was smaller. As far as the intensity of local spatial continuity in sampling is concerned, the nu mber of incisions was higher but the number of frass holes and emergence holes smaller in the mix ed stand of P. alba var. pyramidalis and Acer negundo than in the pure stand of *P.simonii*×*P.nig ra* var. italica. This indicated that the damage caused by Anoplophora glabripennis was aggregate d in the mixed stand of *P.alba* var. pyramidalis and Acer negundo and scattered in the pure stan d of *P.simonii*×*P.nigra* var. *italica*.

Key words Anoplophora glabripennis; cerambycidae populus acer spatial distribution geostatistics

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通讯作者 温俊宝 wenjb@bjfu.edu.cn