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ECOLOGICAL DISTRIBUTION OF SOIL ANIMALS IN BROAD-LEAVED PINE FORESTS IN SOUTHERN SLOPE OF XIAO HINGGAN MOUNTAINS

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ABSTRACT: This paper studied the soil animals of four type forests of broad-leaved pine forests in the southern slope of the Xiao Hinggan Mountains. The samples were extracted from four forest types in every first week of June, August, October, and every forest type was chosen out three plots. Since there are different soil animals in different depths, every plot was divided into four partitions with the same vertical distance: litter, 0 – 10 cm, 10 – 20 cm, 20 – 30 cm. Using hand sorting out large soil animals, Tullgren method (to middle and small soil animals) and Baermann method (to moist soil animals) to collect soil animals. Among the four type forests, insecta has the largest amount of groups of 54. *Oribatida* has the most number of individual, which is 1547, occupying 21.73 percent of total collectings. There are 81 groups of soil animals, totalling 7118 belonging to 8 Class 24 Order 57 Family, in which there are 54 groups of big-sized soil animals totalling 2370, 41 groups of middle and small-sized soil animals totalling 4808. Among all the soil animals, their dominant group is 3 ones, usual growp is 14 ones, and rare group is 64 ones. The results show that among the four type forests, the groups of soil animal in *Tilia* pine forest are much more than the others, with the highest variety index, and the individual number of the soil animals is also very large. The numbers of group and individual in *Picea-Abies* Pine forest are both small. Among the four forest types, the soil animals in *Tilia* pine forest are most similar to *Betula costata* pine forest. There is so little similarity between the soil animals in *Picea-Abies* pine forest and in the other three forest types.

KEY WORDS: Xiao Hinggan Mountains; soil animal; , ecological distribution

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Broad-leaved pine forests are the typical zonal vegetation and its central distribution zone is in the Changbai Mountains in northeast China. However, because of man's disturbance and destruction, primitive broad-leaved pine forests exist now only in a few areas such as the Changbai Mountains of Jilin Province and Wuying, Liangshui Natural Reserves of Heilongjiang Province, and the forests in other places are substituted by natural secondary forests (WANG, 1994). Broad-leaved pine forests in the Changbai Mountains have been well researched and reported. But the study on forests of this kind in Liangshui Natural Reserve is limited only to vegetation, birds and beasts, while the study on soil animals still stays

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S_C— the number of the common groups at community A and B.

S_A— total number of the community A's appearing groups.

S_B— total number of the community B's appearing groups.

The calculating results are as Table 3.

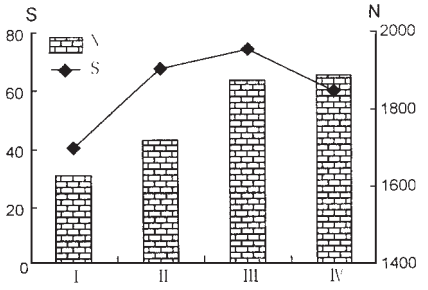

Fig. 2 The numbers of groups and individuals in four type forests
S: number of groups, N: number of individuals

Table 2 The species diversity index of forest types

Forest type	I	II	III	IV
H	0. 7792	1. 0524	1. 1467	1. 1006

Table 3 Community common index

Forest type	I	II	III
IV	0. 6667	0. 8059	0. 8271
III	0. 6491	0. 8652	
II	0. 6729		

The order of the common index is:

$C_{23} > C_{34} > C_{24} > C_{12} > C_{14} > C_{13}$

C_{23} is the largest one with the number to 0. 8652, which proves that the type Ⅱ is similar to the type Ⅲ. As C_{13} is the smallest one, the similarity between type Ⅰ and type Ⅲ is too little. That C_{23}, C_{34}, C_{24} are a little hither than $C_{13}(> 0.8)$ proves the similarity between type Ⅱ, Ⅲ and Ⅳ is more obvious. But type Ⅰ is little similar to the other three types(< 0.7), which mainly because there are accompanying species such as *Picea* sp. and *Abies* sp. belonging toconiferoustrees in type Ⅰ besides pine, which make environment cool and wet, and the litter don't consume so well, so the soil animal groups is obviously different from the broad-leaved pine forests(Ⅱ. Ⅲ. Ⅳ).

Among the three kinds of broad-leaved pine forests the similarity between type Ⅱ and Ⅲ is obvious, while the similarity between type Ⅳ, Ⅱ and Ⅲ is a little weak. Because type Ⅳ is *Quercus mongolica* pine forest with dry environment, which is much difference between type Ⅱ and Ⅲ.

4 CONCLUSION

There are 81 groups of soil animals, totalling 7118, belonging to 8 Class, 24 Order and 57 Family, in which there are 54 groups of big-sized soil animals totalling 2370, 41 groups of meddle and small-sized soil animals, totalling 4808. Among all the soil animals the dominant groups are 3 ones, usual groups is 14 ones, and rare group is 64 one.

Among the four types of the broad-leaved pine forests, the soil animal groups in *Tilia* pine forest are largest in the highest variety index, and the number of the soil animals is also very large. But the numbers of soil animals and the groups of *Picea-Abies* pine forest are both small.

There is so little similarity between the soil animal groups in *Picea-Abies* pine forest and in the other three broad-leaved pine forest, while there is much more similarity among the three broad-leaved pine forests. The soil animal groups in *Tilia* pine forest are the most similar to *Betula amurensis* pine forest.

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