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**TOURIST TRAFFIC AS A FACTOR AFFECTING GROUND COVER IN AN
OAK-HORNBEAM ASSOCIATION OF THE LAS BIELAŃSKI**
(Zmienność runa leśnego w grądzie wysokim rezerwatu Las Bielański
pod wpływem ruchu turystycznego)

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Abstract; Las Bielański covers 150 hectares in area is a unique remnant of the ancient Mazowiecka Forest. At present 130 hectares out of 150 hectares are a nature reserve, where the influence of humans is limited only to tourist paths.

The aim of this research was to estimate a possible impact of use the path by humans on the development of nearby plants. Namely, whether the presence of the path induces any changes, and if so, what sort and scope of the changes is seen.

A 125 m long section of a tourist path, located in an oak-hornbeam association was chosen. Three sampling lines parallel to the path were traced: line A – 15-30 cm distant from the path's edge, line B – 5 m away, and line C – about 10 m away from the path's edge (Fig. 1). Plants were collected using sample squares of 0.1 m² in area, distributed evenly along each line (25 samples per line, i.e., 75 samples altogether).

The data collected in the field were analysed statistically. Most of the species exhibit clumped distribution of the amount of sprouts (Tab. 1). This phenomenon is seen in each line. In order to demonstrate the differences in abundance of sprouts, as well as differences in plant cover between the samples taken along the three lines, nonparametric statistics were applied – the Mann-Whitney test and Kruskal-Wallis ANOVA. The results of those analyses show for restricted plant cover in the line closest to the path: the percentage of the coverage and the number of sprouts per sample in line A are lower than those estimated for lines B and C (Fig. 3). The species occurring most frequently are those typical of the oak-hornbeam association. The estimate of frequency is the lowest for all the species directly in the closest vicinity of the path (Fig. 2). Seasonal variability is evident, too.

No presence of animals was noticed within the distance of 5 m from the path's edge. The majority of animal traces occurred around line C, about 10 m distance from the path.

Particular attention was paid to distribution of hornbeams (*Carpinus betulus*) – the species in the oak-hornbeam association. No significant differences were found between the three lines as far the amount of hornbeam sprouts and frequency is concerned (Fig. 4 and 5). The number of sprouts of this species is the highest in spring, and it decreases gradually, due to heavy mortality of seedlings and juvenile specimens, with progressive light shortage. It means, the tourist traffic is not the only factor affecting plant abundance.