

**Tinya, F., Mihók, B., Márialigeti, S., Mag, Zs. & Ódor, P. (2009): A comparison of three indirect methods for estimating understory light at different spatial scales in temperate mixed forests. Community Ecology 10(1): 81-90. Akadémiai Kiadó, Budapest.**

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Short reference: Tinya et al. (2009)

First author: Tinya, Flóra

Year: 2009

Abstract

Tinya, F., Mihók, B., Márialigeti, S., Mag, Zs., Ódor, P. (2009): A comparison of three indirect methods for estimating understory light at different spatial scales in temperate mixed forests

Three indirect light measurement methods were compared in mixed deciduous and coniferous forests with heterogeneous stand structure: tRAYci - a spatially explicit light model calculating percentage of above canopy light (PACL); LAI-2000 Plant Canopy Analyzer measuring diffuse non-interceptance (DIFN); and spherical densiometer estimating canopy openness (CO). Correlations between the different light variables were analyzed at several spatial scales (at 5x5, 10x10, 15x15, 20x20 and 30x30 m<sup>2</sup>). Relationships between light variables and the cover of a light flexible plant, blackberry (*Rubus fruticosus* agg.), as a potentially sensitive response variable for light conditions were also investigated. LAI-2000 (DIFN) and tRAYci (PACL) seemed the most appropriate for the description of the light environment in the investigated stands. DIFN and PACL had stronger correlations with each other and with blackberry cover than CO. Spatial heterogeneity of light (expressed with coefficient of variation) showed much stronger correlations than mean values both between the methods and between light intensity and *Rubus* cover. The correlation values between the methods increased towards coarser scales (from 5x5 to 30x30 m<sup>2</sup>), while the correlation

between light intensity and blackberry cover had a maximal response at the scale of 20x20 m<sup>2</sup> if a lower resolution of light estimation was used, and had also a maximum at smaller scales if the light was calculated for more points per plot by tRAYci. LAI-2000 can be recommended for the comparison of different stands, however, for fine scale description of light conditions of a stand tRAYci seems to be more appropriate.

[forest ecology](#)

[methodology: analysis, statistics](#)

[phytosociology](#)

Notes

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Tartalom

Introduction

Methods

Study area

Data collection

Data analysis

Results

Descriptive statistics

Correlations between methods

Relationship between variables of light and blackberry cover

Discussion

Comparison of techniques

Effect of mean and heterogeneity of light

Scales

Conclusions

Acknowledgements

References

light model, light-understory interaction, plant canopy analyzer, spatial steps, spherical densiometer

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