MEETINGS OF THE BOTANICAL SOCIETY OF THE NETHERLANDS

MEETING OF THE SECTION FOR VEGETATION RESEARCH ON APRIL 11th, 1969

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A quantitative analysis of vegetation boundaries and gradients in a north Drenthe heath.

In a North Drenthe heath vegetation boundaries and gradients were studied. Relations between vegetation boundaries and the abiotic environment were detected. Three methods of quantifying the "amount of boundary" along a transect were compared. 1. A method of VAN DER MAAREL (1968) and BELLAMY, *c.s.* (1969). The affinity (Jaccard's coefficient) between each pair of adjacent quadrats is calculated (G_{RQ}). 2. Each species in a quadrat gets a score g=1 when it is not present in both adjacent quadrats, else g=0. The sum of g's within each quadrat is expressed as a percentage of the total number of species in the quadrat (G_G). 3. Of each transect as a whole the correlation coefficients between all species pairs are calculated and assembled in a matrix. In each quadrat the mean correlation between species expresses the amount of boundary (G_{RS}). The third coefficient G_{RS} turned out to be least oscillating and so presenting the most usable curves. An investigation of the relation between species and their presence within a boundary zone yielded information about the species of the Nardo-Galion.

Factor analyses of the variables in each transect showed that sometimes relations between vegetation and environment cannot be analysed indirectly. A simple simulation was carried out. A number of variables between which all interrelations were known were representing the participants of a biocoenosis within an area. A comparison of factor analysis of random chosen stands and transect gradient analysis showed that the indirect method yields information about the conduct along a gradient of the vegetation as a whole, but that the study of relations between species populations and environment needs direct analysis.

D. A. VESTERGAARD

Investigating relations between moth populations (Lepidoptera) and vegetation structures in the isle of Voorne.

During the last ten years, the "Entomologische Werkgroep Voorne" (R. Vis, J. G. van der Made & D. A. Vestergaard), under the auspices of R.I.V.O.N., has been engaged in studying macrolepidoptera in the dune area of the isle of Voorne, south west of Rotterdam. The area is very rich in plant communities (VAN DER MAAREL & WESTHOFF 1964). We observed 534 species of macrolepidoptera (butterflies and moths), about 60% of the Dutch fauna. As detailed vegetation maps were available, special attention was paid to the study of relations between vegetation and distribution patterns of moths. Different sampling techniques were used.

1. Two modified Robinson moth traps with M. V. (high pressure) lamps (125W) were applied. During 1963 and 1964, these lamps were burning continually. The catch amounted to 300,000 macrolepidoptera. Species and numbers per species were registered. The "Heveringen area" (the old inner dunes), investigated with these traps, proved to be able to produce up to 215 species in one warm summer night. This is in accordance with the high degree of differentiation and stability of the vegetation in this area. The number of plant species is also extremely high.

2. In 1964, ten plastic gauze cages ($0.3 \times 1 \times 1$ m) were used in order to get hold of the butterfly and moth fauna of ten sq. metres of Festuco-Galietum dunes (old Heveringen area). About 350 lepidoptera were noticed within eight months of permanent observation. Roughly used as a standard, this density would suggest a one milliard lepidoptera population in the western part of Voorne (about 30 sq. kms.). It is quite clear, that the herbivorous offspring must greatly influence the vegetation.
3. Series of 4–8 MV lamps (250W) were applied to investigate different vegetation types simultaneously.
A. Open herb vegetations.
B. Open low shrubs.
C. Dense high shrubs.
D. Dune woodlands.
Examples of dry and wet types were selected. During 35 nights, 178 observation lists were made up, concerning about 40,000 macrolepidoptera. Among 354 optima, 184 were situated in A, B and C; 170 in D. There were differences between the Geometrid and Noctuid share. In herb and shrub vegetations, 48 Geometrid optima and 94 Noctuid optima were located (1:2). In woodlands, the numbers were 75 and 70 (1:1). In wet vegetations, 25 Geometrid optima were located and 61 Noctuid optima (1:2); in dry vegetations, the numbers were 23 and 33. In the Elymo-Ammophiletum dunes, the number of Geometrid species was low: 25, vs. 64 Noctuid species. In this habitat we registered 837 moths (113 species). Only two individuals bridged a gap of 70 metres at any rate, as their food plants did not occur within this distance from the lamps.

There is some evidence, that the distribution of aerial populations of moths (except migrating species), is greatly influenced by vegetation structures. Probably, differences in vegetation (patterns and structures) play an important role, as far as they are ecological barriers. This phenomenon may also clarify different catches when we move the moth traps only a few metres.

REFERENCES

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