BRYONORA, Praha, 9: 26-32

THE DISTRIBUTION OF EPIPHYTIC LICHENS IN BOHEMIA: PRELIMINARY RESULTS

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Project of mapping the present distribution of epiphytic lichens started in Czechoslovakia in the seventies: in Slovakia by I.Pišút in 1975, in Bohemia and Moravia by J.Liška in 1978. In both cases records from 1970 onwards were regarded. Method of grid mapping was used and coordinate grid squares of 10' to 6' (MTB grid) were chosen following with the mapping in F.R.G. and Austria (Wirth 1984, 1987; Türk & Wittmann 1984). Czechoslovak national project on lichen mapping progressed rapidly namely in Slovakia where field work was finished in 1981 (Pišút 1985). In the Czech Republic field investigations have not proceeded as fast and therefore I decided to concentrate my efforts on Bohemia. The mapping of this territory has finished and preliminary results are presented.

Distribution maps are the basic result of the grid mapping. Further, the time factor can be taken into account and a comparison with old records can demonstrate remarkable decline (e.g. *Lobaria pulmonaria* - see Liška & Pišút 1990). Among various causes of lichen decline, air pollution impact is the most important factor responsible for deterioration of the epiphytic flora in Central Europe. A comparison of the average year concentrations of sulphur dioxide with distribution maps of selected lichens is demonstrated. Only few species are distributed all over investigated area (e.g. *Lecanora conizaeoides, Hypocenomyce scalaris, Hypogymnia physodes, Buellia punctata*). Distribution maps of many lichens show good correspondence with various levels of sulphur dioxide concentrations (see Fig. 1). White spots in distributions of relatively less sensitive species, e.g. *Parmelia sulcata, Xanthoria parietina* and *Pseudevernia furfuracea* (Fig. 2) show heavy polluted areas as well as sources of medium pollution levels. Presence of damaged thalli on the margins of lichen deserts of these species (open circles with cross) is also typical. Other more sensitive but still frequent species, e.g. *Usnea* spp. (Fig. 2), *Parmelia acetabulum* and *Ramalina fastigiata* (Fig. 3) are present only in areas with low concentration levels of sulphur dioxide. On the other hand, sensitive species as *Parmelia caperata* and *Anaptychia ciliaris* (Fig. 3) demonstrate only relics of relatively rich epiphytic lichen flora and are scattered in areas with the lowest air pollution levels. These species often occur in isolated locality or are often represented by one thallus only. Relic character of habitat (e.g. old tree in park) also plays a role.

Other possible ways for the data analysis might be (i) to use the species quantity, i.e. the number of lichen species per grid square, (ii), a synthesis of co-occurence of selected species sets.

The method of grid mapping yields "improved" maps of lichen distribution; the real situation may be much worse. Of course, the bioindication value of such distribution maps and distortion of real distribution of lichen species depend on the scale used. It is interesting to plot the same distribution data in a different grid scale, e.g. in the UTM grid used in the European Lichen Mapping Project - see in Wirth & Oberhollenzer (1990). A loss of important information (e.g. lichen deserts) in the UTM grid is sizeable (Fig. 3 and 4); thus MTB grid is much more acceptable for bioindication use. Of course, a finer scale would be more appropriate. However, epiphytic lichen vegetation is changing rapidly at present and time interval is very

important for comparability of the results. Generally, method used in any project is chosen as a compromise between the effort needed to get maximum information, aim and time available.

References

Liška J. & Pišút I. (1990): Verbreitung der Flechte Lobaria pulmonaria (L.) Hoffm. in der Tschechoslovakei. - Biológia, Bratislava, 45: 23-30.

Moldan B. et al. (1990): Životní prostředí České republiky. - 281 p., Praha: Academia.

Pišút I. (1985): Die aktuelle Verbreitung einiger epiphytischen Flechten in der Slovakei I. - Zborn. Slov. Nár. Múz. - Prír. Vedy 31: 3-26.

Türk R. & Wittmann H. (1984): Atlas der aktuellen Verbreitung von Flechten in Oberösterreich. - Stapfia 11: 1-98.

Wirth V. (1984): Rasterkartierungen von Flechten in Mitteleuropa. Eine Übersicht. - Herzogia 6: 477-490.

Wirth V. (1987): Die Flechten Baden-Württembergs. Verbreitungsatlas. - 528 p., Stuttgart: Ulmer.

Wirth V. & Oberhollenzer H., eds. (1990): Lichen Mapping in Europe. Proceedings of the First meeting on lichen mapping in Europe held at Stuttgart from September 22nd to 24th, 1989. - Stuttgart. Beitr. Naturk., ser. A, 456: 1-199.

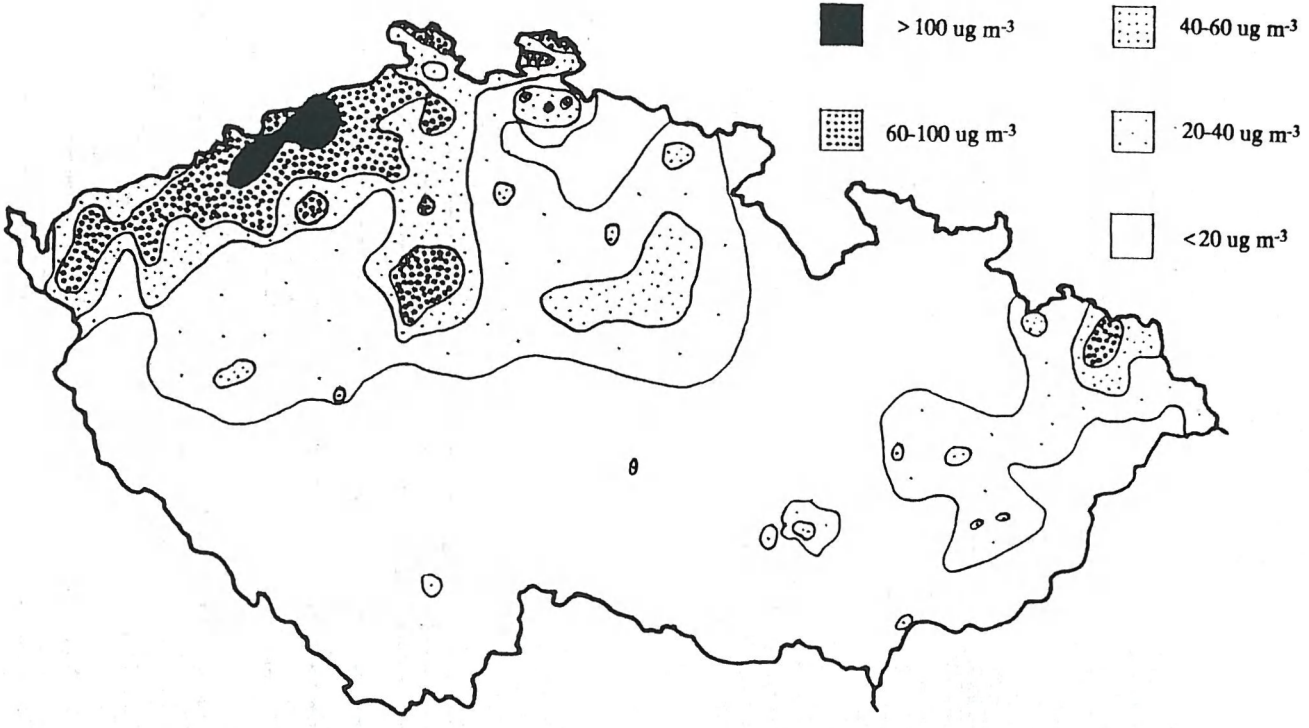
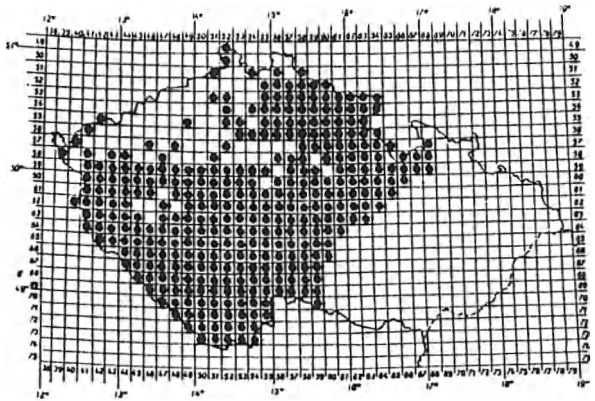
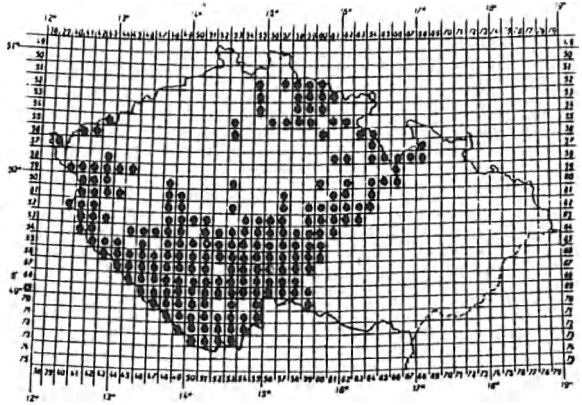


Fig. 1 Average year SO_2 concentrations in the Czech Republic in the 1981-85 period (Moldan 1990).

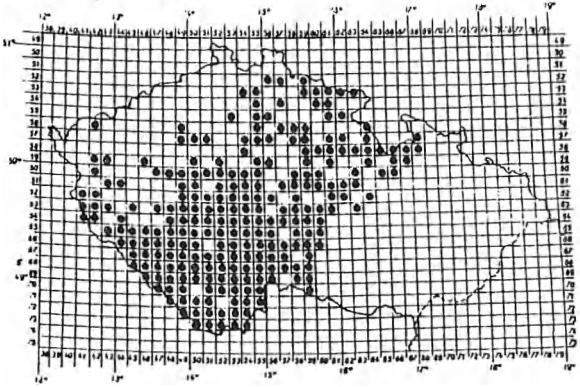
Parmelia sulcata



Pseudevernia furfuracea



Xanthoria parietina



Usnea sp.

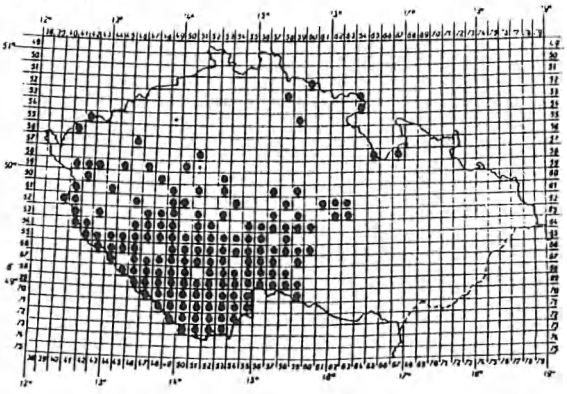
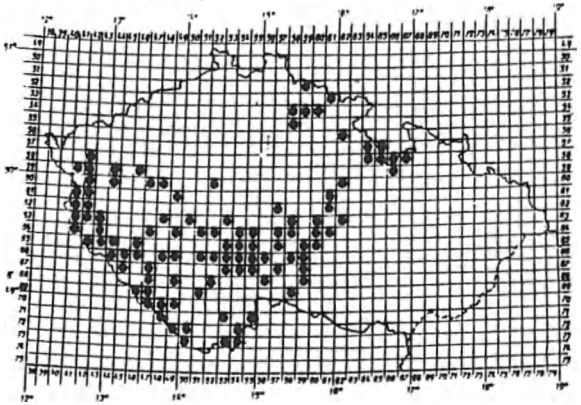
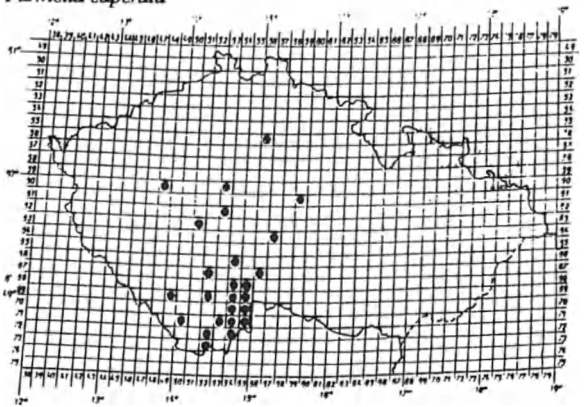


Fig. 2 Distribution of selected lichen species in Bohemia (the territory of Moravia is not covered).

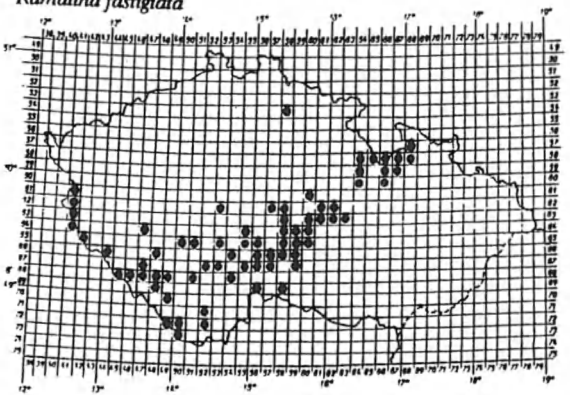
Parmelia acetabulum



Parmelia caperata



Ramalina fastigiata



Anaptychia ciliaris

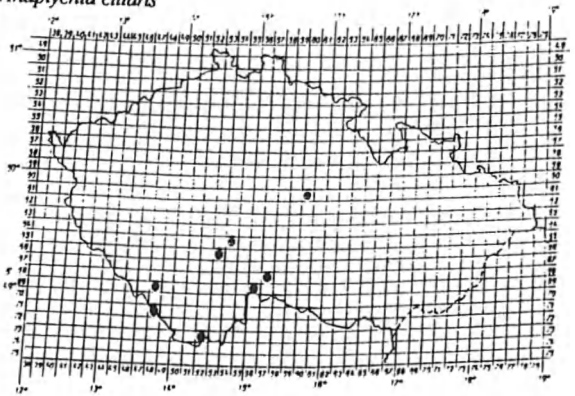
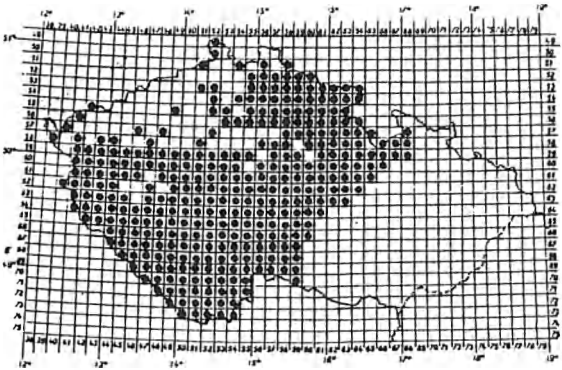


Fig. 3 Distribution of selected lichen species in Bohemia (the territory of Moravia is not covered).

Parmelia sulcata



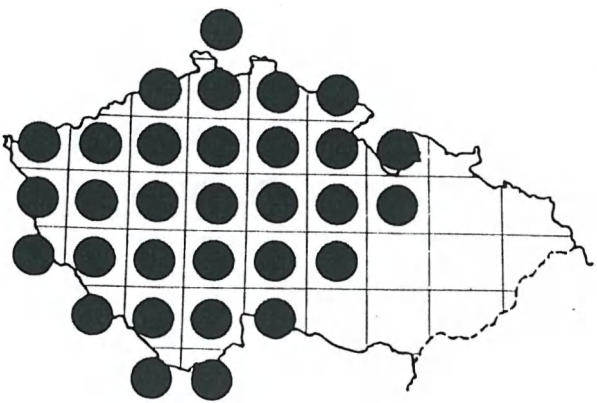
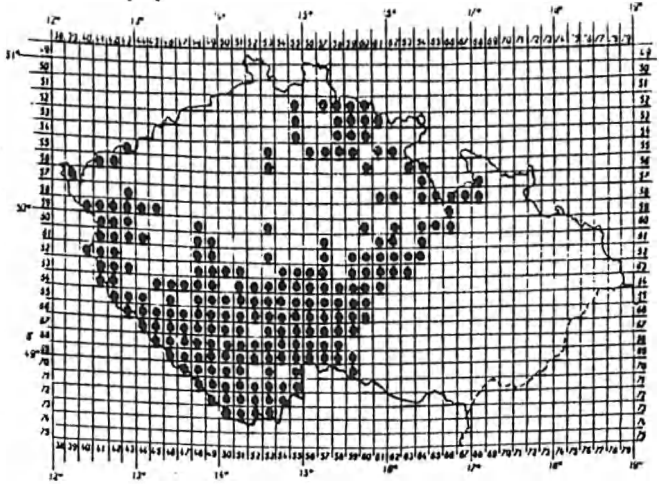
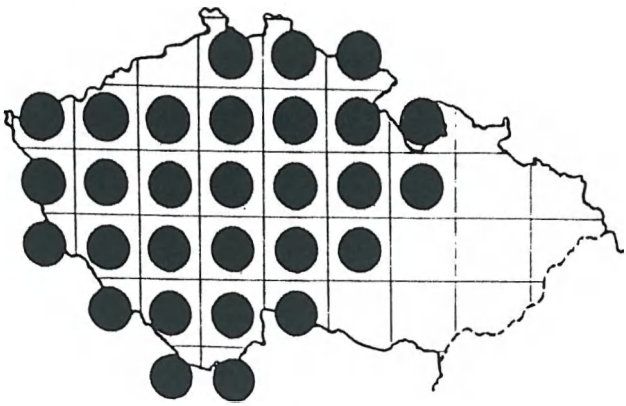


Fig. 4 Comparison of distribution data plotted in different grid scales; to

Pseudevernia furfuracea

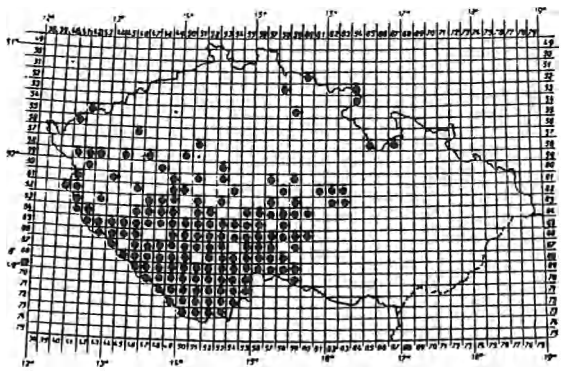


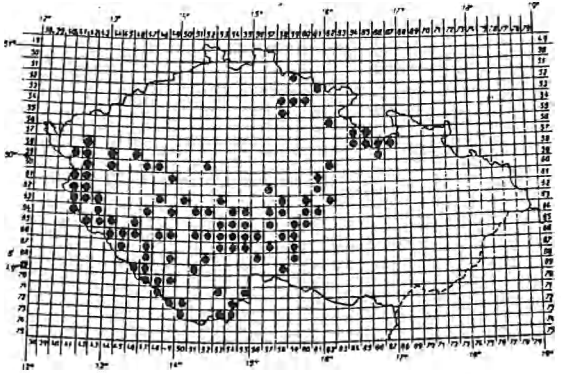


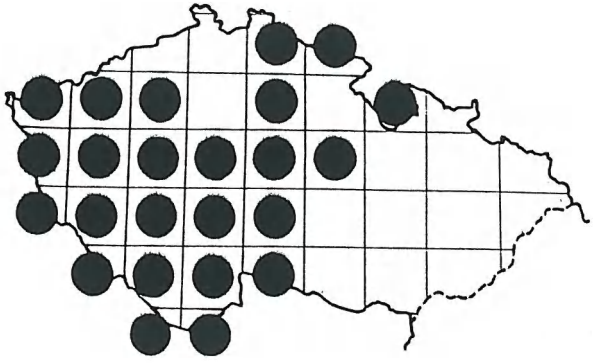
ıp - MTB grid, bottom - UTM grid.

Usnea sp.

Parmelia acetabulum







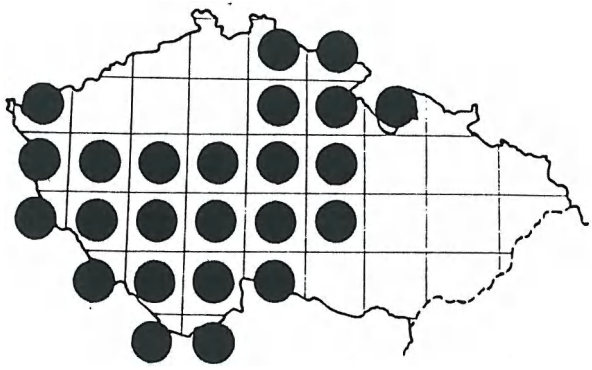


Fig. 5 Comparison of distribution data plotted in different grid scales; top - MTB grid, bottom - UTM grid.