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LICHENS AS PHYTOCLIMATICAL INDICATORS IN THE TRIESTE KARST*

*I LICHENI COME INDICATORI FITOCLIMATICI NEL CARSO TRIESTINO**

Abstract — Three biotopes of the Trieste Karst have been compared on the basis of chorological spectra relative to their lichen florulas, subdivided according to main substrate types: bark, soil, sandstone, limestone. Lichen species with similar distribution patterns tend to have similar ecological requirements. They seem to respond well to differences in air humidity and temperature. Therefore, lichen species can be used as phytoclimatical indicators.

Key words: Lichens, Phytogeography, Trieste.

Riassunto breve — *Gli spettri corologici relativi alle florule licheniche di tre biotopi del Carso Triestino, suddivisi per tipo di substrato (scorza, suolo, calcare, arenaria) sono stati analizzati tramite metodi di analisi multivariata. Specie licheniche con areali simili tendono ad avere simili esigenze ecologiche. In particolare, i licheni sembrano essere molto sensibili a differenze in temperatura ed umidità atmosferica, il che permette la loro utilizzazione quali indicatori ecologici.*

Parole chiave: *Licheni, Fitogeografia, Trieste.*

Introduction

Aim of this paper is to test the use of lichens for the phytogeographical and phytoclimatical characterization of different biotopes. In particular, the study aims to quantify the degree of correlation between lichen species with similar ranges and biotopes characterized by different ecological conditions.

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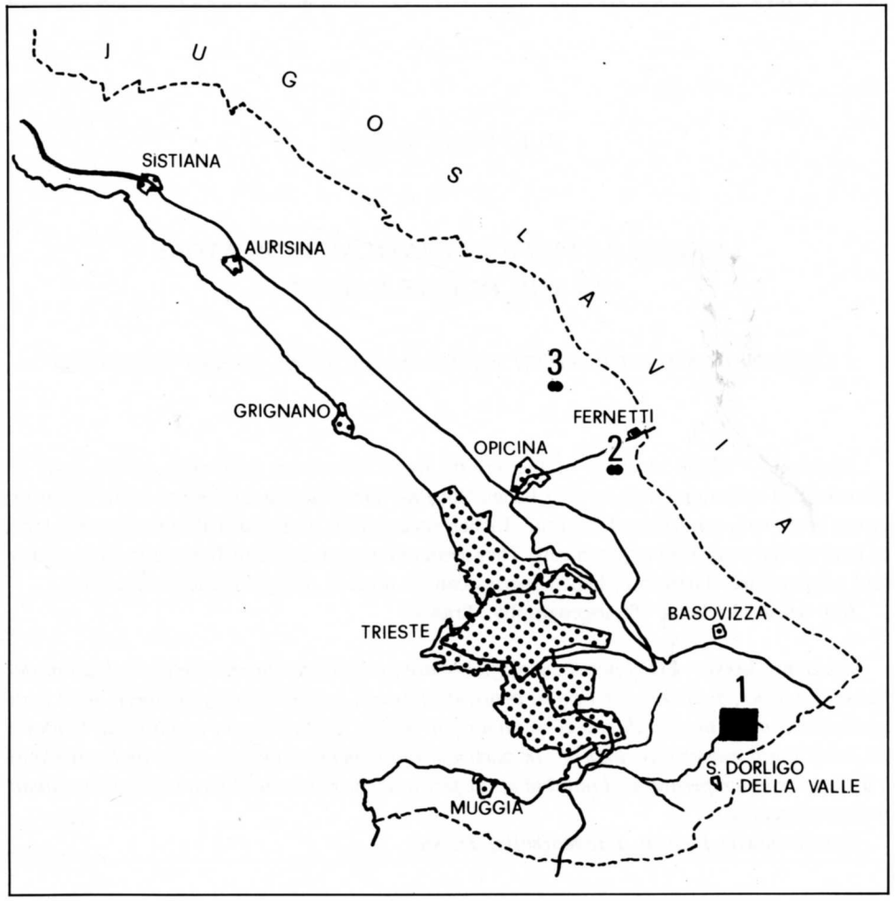

Fig. 1 - Location of study areas.
- *Localizzazione delle aree studiate.*

The analysis is performed on the basis of species lists relative to three biotopes located in the Karst region surrounding the town of Trieste (fig. 1): the Rosandra-Valley (NIMIS & LOI, 1981), the Doline of Percedol (NIMIS & LOI, 1983; NIMIS, 1983) and the Doline of Fernetti (LOSI, 1983). Each area is described in terms of a chorological spectrum relative to the whole of its lichen flora and by other spectra referring to sub-lists of species growing on four main substrate types: bark, soil,

limestone, sandstone (the latter present only in the Val Rosandra).

The basic assumption underlying the present study is that species with similar distribution patterns tend to have similar ecological requirements, above all in respect with climate. Consequently, differences in chorological spectra between different biotopes could be utilized for their phytoclimatical characterization. This is an extension to lichen species of a kind of analysis already attempted by FEOLI CHIAPELLA & FEOLI (1983) for the phanerogamic flora of M. Paularo (Carnian Alps) and by NIMIS (1983b) for the phanerogamic flora of Sicily.

Description of study areas

A first general remark concerning the ecological characterization of the three biotopes is that they are far from presenting homogeneous ecological conditions all over their respective surface. They are representative of two main geomorphological units in the landscape system of the Karst region: dolines and a karst valley. Microclimatical conditions in different parts of a doline (POLLI, 1961) or at the two side slopes of the valley (POLLI, 1981) are generally very different. The climatic diagrams of the three biotopes are in fig. 2(1). The temperature curves refer to the bottom and outer margin of the two dolines (the former is colder than the latter) and to two stations located at the two side slopes of Val Rosandra, one South-exposed, the other North-exposed. From the three climatic diagrams it is evident how the Doline of Percedol is the coldest among the three biotopes, Val Rosandra the warmest, whereas the Doline of Fernetti is characterized by temperatures that are intermediate between those of the two former biotopes.

Further data on the three biotopes are given below:

Doline of Percedol: Elevation: 270 m (bottom) - 304 m (margins).
Diameter: 400-270 m.
Surface: ca. 0.02 Km^2.
Nr. of Lichens: 106 (NIMIS & LOI, 1983).

Doline of Fernetti: Elevation: 269.3 m (bottom) - 315/320 m (margins).
Diameter: 0.5 Km (E-W) - 0.38 Km (N-S).
Surface: 0.04 Km^2.

(1) Data sources: POLLI, 1983 (Percedol); COLAUTTI, 1984 (Fernetti); COLAUTTI, 1975 (Val Rosandra).