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THE LICHENS OF THE MAUSOLEUM OF MUNATIUS PLANCUS (GAETA)

Die Flechten am Mausoleum des Munatius PLANCUS (Gaeta)

by

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Key words: Monument deterioration, Epilithic lichens, Central Italy.

Schlagwörter: Denkmalschäden, Epilithische Flechten, Mittelitalien.

Summary: This study was carried out in line with the project promoted by the Central Institute for Restoration (ICR) entitled "Carta del Rischio del Patrimonio culturale", and the aim was to verify the state of the Mausoleum of Munatius PLANCUS with regard to lichen colonization. The Mausoleum, on top of Mount Orlando (south Italy), is a tower-like building covered by heavy blocks of limestone. Sixty-three relevés were carried out on the monument. The highest lichen cover is concentrated in northern expositions, while the southerns has a very poor lichen cover. Most of the species (37) area mainly xerophytic, photophytic and rather nitrophytic.

Zusammenfassung: Diese Studie wurde als Teil des Projektes: "Carta del Rischio del Patrimonio culturale", gefördert vom Central Instiute for Restoration (ICR), mit dem Zweck durchgeführt, den Zustand des Mausoleums des Munatius PLANCUS mit Bezug auf die Flechtenbesiedelung festzustellen. Das Mausoleum auf dem Gipfel des Mount Orlando (S-Italien) ist ein turmähnliches Gebäude, welches mit schweren Kalkblöcken verkleidet ist. Es wurden dreiundsechzig Aufnahmen am Monument vorgenommen. Der dichteste Flechtenbewuchs findet sich auf der Nordseite, während südexponierte Teile nur wenig von Flechten besiedelt sind. Die meisten der Arten (37) sind überwiegend xerophytisch, lichtbedürftig und nitrophil.

Introduction

A national project, named "Carta del Rischio del Patrimonio Culturale" was launched by the Central Institute for Restoration (ICR) with the aim to assess and monitor the evolution of the preservation status of selected monuments throughout Italy. The Mausoleum of Munatius PLANCUS was selected as one of the target monuments in Latium region (central Italy).

As a component of the more general study being carried out on this monument, in 1995 we evaluated its lichen colonization.

The lichens of the archeological areas in the same region have been previously studied by NIMIS et al. (1987).

Study site

Munatius PLANCUS built his memorial monument (Fig. 1) about the first century B.C. on top of Mount Orlando (167 m), overlooking the gulf of Gaeta.

The submediterranean climate is characterized by a very brief summer season of relative drought.

The Mausoleum is a tower-like building, the diameter being 29.5 meters. Externally, it shows a partially buried first level, then a second cylindrical level about 11.30 m high, and finally a line of merla. The walls are externally covered by heavy blocks of limestone, some of them still covered by samples of the original plaster made of "malta a calce" and calcareous "powder". The basal first level and the top of the building are covered by modern plaster made of concrete which was applied in 1956 during the last restoration work.

Data and methods

Sixtythree phytosociological relevés were carried out at the various orientations, on the cylindrical second level (27 relevés) at various heights as allowed by the restoration works, on the basal level (18), on the concrete cover and the merla (16) further two more relevés on the memorial marble target.

Classification of the relevés was realized by package Syn-tax 5.0 (PODANI 1993). The algorithm is Complete-link, the resemblance the Euclidean d.

Results and discussion

Floristic list includes 37 species, quite common in archeological sites of the Latium (NIMIS et al. 1987) almost all being photophytic, xerophytic, fairly nitrophytic and obviously calcicolous.

The most widespread species were:

o) *Dirina massiliensis*, present with hight cover values but only on the first

and second cylindrical levels mainly on vertical surfaces and only on limestone and plaster;

- o) *Verrucaria nigrescens*, never on south exposed surfaces but present at any level, on various substrata, on horizontal to vertical inclined surfaces;
- o) *Thelochroa montinii*, a new finding for Latium region (Nimis, 1993), growing all over the Mausoleum, on all substrata.

The key factor determining lichen distribution is mostly from the exposures even though the substratum, the elevation from soil, the surfaces slope affect it greatly (Tab. 1).

The lichen colonization of the building is very disomogeneous (Fig. 2): most species and the highest percentages cover were found on the northern sides of the monument, whilst on the southern ones hardly any lichen can be found. We could not sample on the SE side. A single relevé on the SW side found only three species and a total 10% cover, and the single relevé on the southern side found five species and a total 15% cover.

Seven groups can be identified in the classification dendrogram (Fig. 3): the relevés carried out on the merla (1) and the cover (2), almost all horizontal surfaces; the relevés of the southern (3), eastern (4) and western (5) sides, and the others carried out on the northern sides, on the basement (6) and the cylinder (7).

With regard to the aim of this search, the conclusions are that:

- i) the cover percentage is rather limited,
- ii) few species are present and a few of them are "aggressive",
- iii) the lichen community does not appear to affect the white color of the monument's stones.

Therefore, we suggest that the lichens are not among the most important threat to the preservation of the Mausoleum of Munatius Plancus.

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Species growing all over
Aspicilia calcarea (L.) MUDD
Caloplaca flavescens (HUD.) LAUNDON
Candelariella aurella (HOFFM.) ZAHLBR.
Diplotomma alboatrum (HOFFM.) FLOT.
Lecanora albescens(HOFFM) BR&ROSTR
Species colonizing only the plinth and the second cylindrical level
Catillaria lenticularis (ACH.) TH.FR.
Dirina massiliensis DURIEU & MONT. (only N and NE exp. releves)
Porina linearis (LEIGHTON) ZAHLBR.
Verrucaria viridula (SCHRADER) ACH.
Thelochroa montinii MASSALONGO
Species lacking on the roof
Caloplaca lithophyla MAGNUSSON
Lecania turicensis (HEPP) MÜLL.ARG.
Lecanora crenulata HOOKER
Toninia aromatica (SM.) MASSALONGO
Species lacking on S and SW exposures
Caloplaca citrina (HOFFM.) TH.FR.
Caloplaca velana (MASSAL.) DURIETZ
Lecanora campestris (SCHAERER) HUE
Lecanora pruinosa CHAUB.
Clauzadea immersa (WEB.) HAF.&BELL.
Verrucaria nigrescens PERSOON

Species growing exclusively on vertical surfaces

only on the cylinder

Caloplaca inconnexa (NYL.) ZAHLB.
Lecania spadicea (FLOTOW) ZAHLB.
Lecidea lurida ACH.
Porina linearis (LEIGHTON) ZAHLB.

all over the monument

Lecanora dispersa (PERS.) SOMMERF
Physcia adscendens (FR.) OLIV.
Solenopsora candicans (DICK.) STEINER
Verrucaria marmorea (SCOP.) ARNOLD

Species growing exclusively on roof and merla

horizontal surfaces only

Caloplaca erythrocarpa (PERS.) ZWACKH
Caloplaca ochracea (SCHAER.) FLAGEY
Caloplaca teicholyta (ACH.) STEINER
Diplotomma epipolium (ACH.) ARNOLD
Xanthoria parietina (L.) TH.FR.

horizontal and vertical surfaces

Caloplaca crenulatella (NYL.) OLIV.
Caloplaca ferrarii (BAGL.) JATTA
Caloplaca variabilis (PERS.) MÜLL.ARG.
Lecidella carpathica KÖRBER
Sarcogyne regularis KÖRBER

Species on the memorial tablet (marble)

Caloplaca flavescens (HUDSON) LAUNDON
Caloplaca lithophyla MAGNUSSON
Dirina massiliensis DURIEU & MONT.
Lecanora albescens (HOFFM.) BRANTH. & ROSTR
Lecanora pruinosa CHAUB

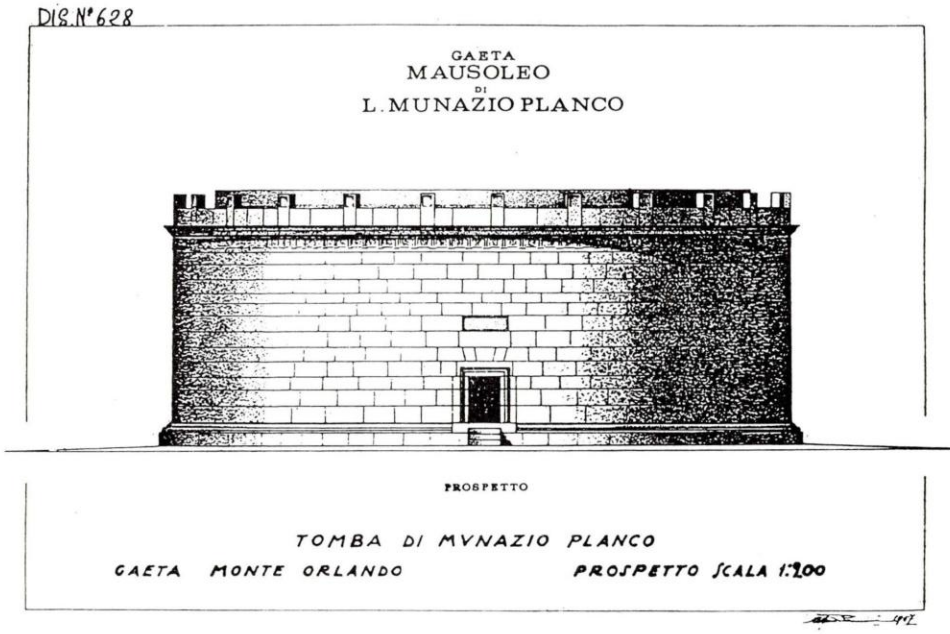
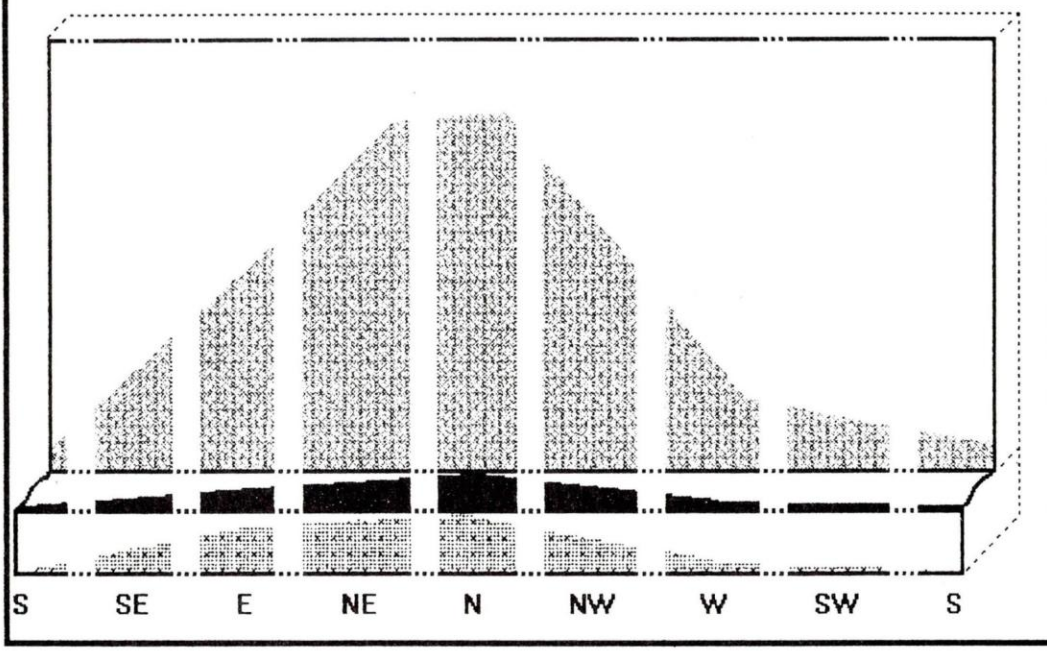


Fig. 1 - The Mausoleum of Munatius Plancus.

Fig. 2 - Lichen cover on the Mausoleum according to the exposures.



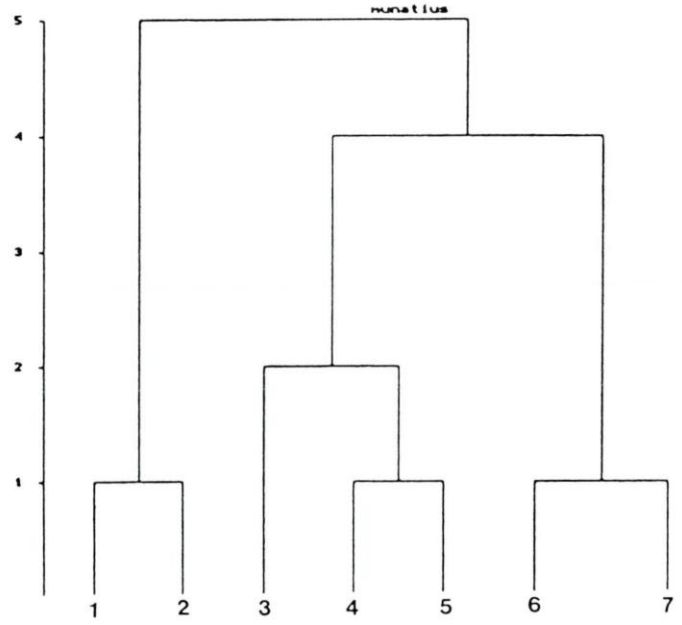


Fig. 3 - The groups obtained by numerical classification of the relevés: 1) merla; 2) cover; 3) southern, 4) eastern and 5) western sides; 6) basement and 7) cylinder northern sides.