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FIRST PHYTOSOCIOLOGICAL  
INTERPRETATION OF *QUERCUS TROJANA*  
WEBB VEGETATION IN THE MURGE REGION  
(BARI — TARANTO — SOUTH ITALY)

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Here we propose a preliminary interpretation of phytosociological dynamism of the coenoses linked to the presence of *Quercus trojana* Webb in the Murge region between Bari and Taranto (Apulia — South Italy).

It appears that *Quercus trojana* Webb has placed itself between the lower level of *Quercetalia pubescentis-petraeae* stage, and the upper of *Quercetalia ilicis*, even if microclimatic situations create many interpretation problems.

Introduction

On the Murge hills, the elevations which cross the Provinces of Bari and Taranto to join those of Matera (Fig. 1), the typical and original woodland consists of »fragno«, *Quercus trojana* Webb (= *Q. macedonica* DC.) (Crivellari 1950), even if today a good part of it has been substituted by cultivated land and herbaceous coenoses.

This oak with a Balkan gravitation area, seems to form an area or band which in other parts of Italy is occupied by other deciduous oaks, but its flora makes the interpretation of this fact all the more difficult.

It is evident that *Quercus trojana* Webb exists here, but what this means phytosociologically is more difficult to explain; in fact, there are two, or rather three situations in which this arboreal species is found. Starting from the third, the least important from a phytosociological point of view, it is made up of single individuals or of rows along the edges of fields, meadows or pastures, indicating the reason for existence, if not anthropic, at least anthropised.

The other two more important situations are more interesting:

1) »Wood« — this term is used to indicate pasture areas covered by »fragni« of large dimensions. There may be an analogy with the »three-lined pastures« of certain zones in the Alps or Appenines, areas destined to the pasture of livestock during the periods of greater insolation; these situations are fundamentally made up of a herbaceous layer which is more or less common to the herbaceous formations grazed upon in the area, a shrub and arboreal layer in which the oak, accompanied by other shrubs, dominates, but without forming the structure of a real wood in the sense of a forestal formation.

2) Grazeable copse — an alternative to the wood is the copse, often used at brief intervals and without much attention and grazed upon. In this situation the arboreal and shrub layers are richer in species also phytosociologically interesting, and the herbaceous layer, again deeply influenced by grazing, is made up of many species characteristic of the young, clear heliophile stages of mediterranean and sub-mediterranean forestal coenoses (Fig. 2).

It is a question of anthropised situations which have been reoccurring for centuries, maybe for thousands of years, and which, rather than a preclimax, can be considered a species of lasting associations (even if these are few), in which the acts of man maintain the floristic order at an intermediate evolutive level, impeding them from reaching that final stage which we probably do not know.

During the last twenty years we have carried out many surveys in the two situations: maybe from a methodological point of view these surveys should not have been effectuated, but they have been useful to us in beginning the task of interpreting the phytosociological meaning of these arboreous coenoses. In all the surveys, if only a few woody species of varying significance, were ever-present, but these, leaving the components of the herbaceous coenosis out of consideration, give us a few indications.

However, on the basis of the species it is difficult to arrive at associations, subassociations, etc., something which is a little more feasible on the basis of the dynamism of the vegetation, the atmospheric conditions etc.

And so we have considered that after some general hypotheses presented some years ago (Chiesura-Lorenzoni, Curti, Lorenzoni 1971) it would be opportune to attempt a new interpretation theory. It is merely a working theory for future surveys and it may stimulate discussions on the topic. The syntaxa shown are *nomen nudum* and therefore not valid according to the code: they are indications following which we hope to insert some specific combinations in the near future.

### The area studied

Between Bari and Taranto, for many kilometres in a perpendicular sense to this direction, stretch the Murge hills, elevations of different altitudes which join the elevations of the Basilicata region in the west (Fig. 1).

These elevations are calcareous structures sometimes deeply carved by valleys, or rather by clefts, similar to canyons, the »gravine« containing many endemic and rare residuous species (Francini, Corti

## QUERCUS TROJANA VEGETATION IN THE MURGE REGION

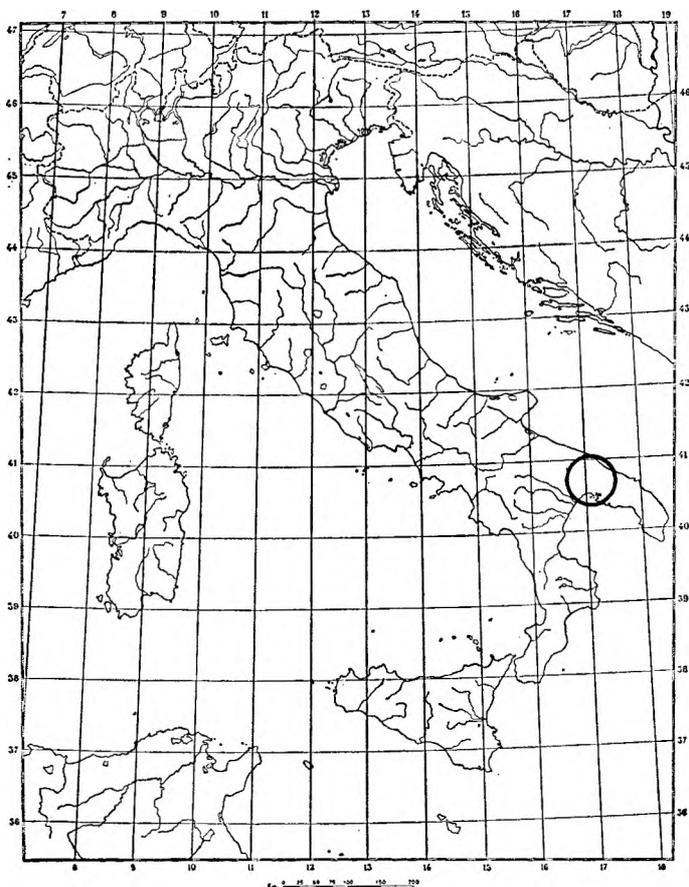
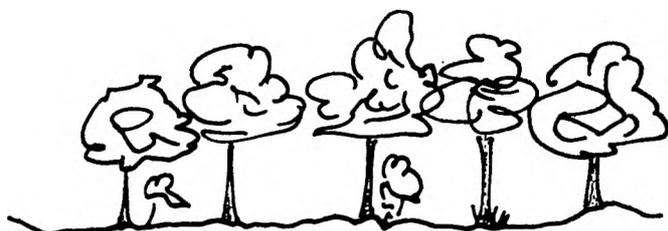


Fig. 1. The area of investigation (O)

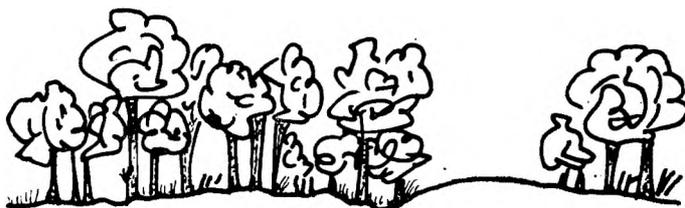
1966). The ground, where it is not made up on calcareous rock, is of Mediterranean red and brown earth, for the most part lacking in *humus* (Carano 1934).

The climate is that of the central-mediterranean areas, mitigated however by the altitudinal effect which, even if limited, determines a regime of both rain and temperatures milder than those of centralsouthern Puglia.

On the Murge hills, the woods of *Quercus trojana* Webb, locally called »fragno«, were once homogeneously distributed. Successively, agriculture and grazing have greatly reduced the woods except in the less accessible areas or where later their economic importance had been seen, as in the case of the woods to be found nearly always around every farm.



"Forest" = pasture with trees sporadically



Clump of trees with grazing potential

Fig. 2. Schematic representation of the two different types of situations in which we can find *Quercus trojana* Webb in Apulia.

### Vegetation

From the physiognomical point of view, the vegetation in the area of Murgia is notably different from other situations in Puglia and on the Appenines in general. Regarding certain aspects in Gargano and others such as in the cliffs of southern Salento, there are more similarities with the coast and the interior of the Balkan Peninsula, southern Yugoslavia (Montenegro, Macedonia, etc.), Albania and north-western Greece.

As in those areas, *Quercus trojana* Webb (Photo 1—4) is the largest component of the deciduous area or band which can be found between the band of *Quercus ilex* L. lower down and the band of *Quercus cerris* L. higher up (Fig. 3).

Without going deep into the matter, for the moment we can imagine, on both sides of the Adriatic, a band of holm-oaks lower down, then a band of »fragno«, a band of *Quercus cerris* L. and finally a band of beeches. However, while this succession finds enough altitudinal space to grow liberally on the eastern side, on the Murge hills, the lack of altitude impedes the band of *Quercus cerris* from developing fully, even if this might be possible as indicated by their sporadic presence, and the band of beeches too is impeded completely from growing.

There is then a further complication due to the presence of *Quercus coccifera* s.l. in certain areas which are particularly xero-thermophilous.

In spite of the above-mentioned methodological difficulties, we have focused our attention on all the surveyable areas and still, after many years, we feel a little disorientated. We would like to take advantage of this occasion to propose some theories.

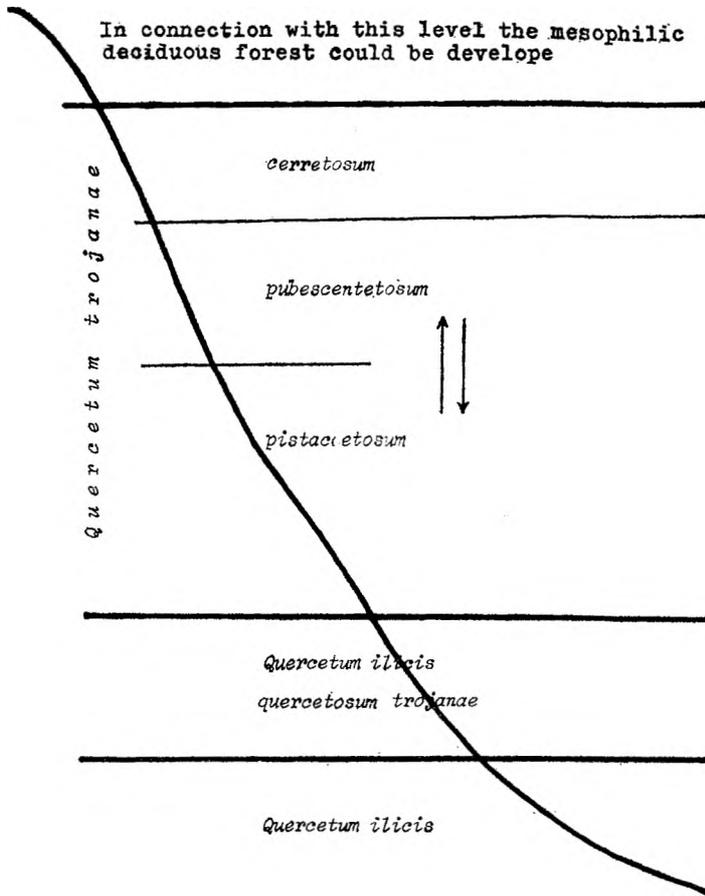


Fig. 3. Schematic representation of series of altitudes and of the relations between the coenoses with *Quercus trojana* Webb and the original Mediterranean vegetation.

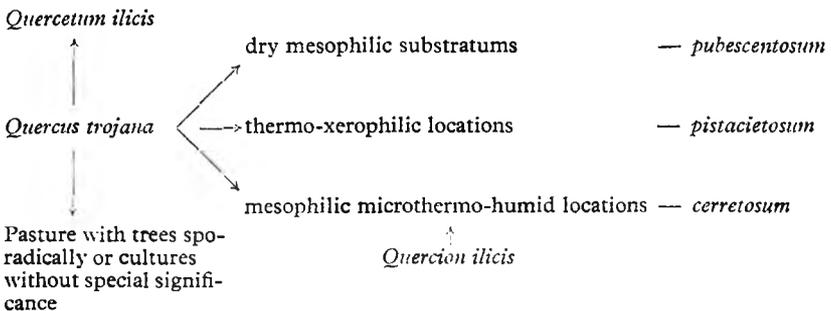


Fig. 4. Dynamism of the vegetation linked to *Quercus trojana* Webb.

## Hypothesis on phytosociological classification

We have already mentioned the phytosociological problem and the basic methodological one. On the one hand we have environments which it is not opportune to survey, a scarcity of characteristic wood or scrub species, an abundance of herbaceous species for anthropic grazing, and on the other hand we have the indicative species, the tree which does not always characterize.

On the other hand, be it correct or not, in the operative phase we would propose a derogation, giving a fundamental phytosociological significance to *Quercus trojana* Webb, that of a characteristic species of a possible, association, and to other oaks that of a differential species of sub-association.

From the examination of surveys carried out in various parts of the Murge hills, an initial division on a physiognomic-phytosociological basis can be made:

1) Woods and undergrowth with elements of the dominant Mediterranean scrub (*Quercion ilicis*).

2) Woods and undergrowth with elements of Mediterranean scrub and deciduous woods (*Quercion ilicis* — *Quercion pubescentis-petraeae*).

On the basis of a deeper examination, we noticed that in any case the species of *Quercion ilicis* (Braun-Blanquet 1951) are always proportionally more numerous and more effective than the species of *Quercion pubescentis-petraeae*, and that *Q. trojana* Webb is not only found in dominant situations but can also be found, if less frequently, in the holm-oak woods on the lower limits of its altitudinal distribution.

We would like, therefore, to propose the following outline which we intend to duly back up in the near future:

### *Quercetea ilicis*

#### *Quercetalia ilicis*

#### *Quercion ilicis*

#### *Quercetum ilicis*

##### 1. *Quercetum ilicis quercetosum trojanae*

#### *Quercetum trojanae*

##### 2. *Quercetum trojanae pistacetosum lentisci*

##### 3. *Quercetum trojanae quercetosum pubescentis*

##### 4. *Quercetum trojanae quercetosum cerris*

##### 5. *Quercetum trojanae quercetosum cocciferae*

In brief, we hereby give a series of initial indications (Fig. 4 and 5):

1. This can be considered a sub-association of transition at the limit, between the highest band i. e. the holm-oak wood and the lowest band, the »fragno« wood. It is, however, a holm-oak wood.

2. This is the most diffused aspect of the fragno wood, often of a thermoxerophile character. It is especially diffused in areas exposed to the sun and having deep earth.

3. *Quercus pubescens* Willd. has no important phytosociological significance, but here it is the most evident element of a small group of species which is more often tied to the higher plains.

4. In certain areas of the Murge, *Quercus cerris* is present even if not in abundance, and it is probable that during certain periods of the Quaternary it was more diffused than it is, in the Basilicata region at present.

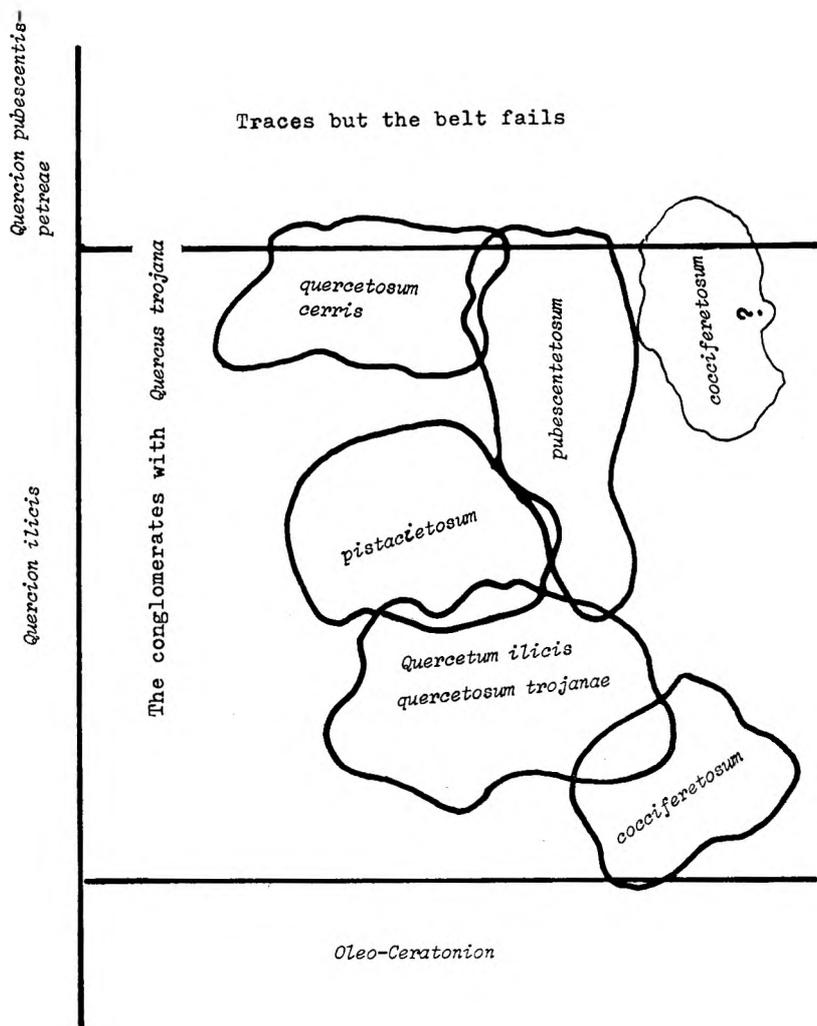


Fig. 5. Graphic presentation of the relations between the hypothetical sub-associations and the three vegetational levels, namely the *Oleo-Ceratonion*, *Quercion ilicis*, and *Quercion pubescentis-petraea*.

In certain areas of the Murge, not only does *Quercus cerris* exist, but it hybridizes with the fragno, a situation related to that of the Balkan Peninsula.

We consider that the sub-association just mentioned regarding Puglia could be diffused on the other side of the Adriatic.

5. *Quercus coccifera* s. l. is sometimes present as a component of the higher shrub layer which is still arboreal, and at times of the lower shrub layer, forming an almost continuous underwood. These situations, even if originating from natural causes, suffer from continuous directive action of the landowner.

Naturally, apart from these typical situations, numerous other transitional and inter-mixed situations can be found, always conditioned by the action of man and the deterioration conditions of the substrata.

### Conclusions

We do not consider it opportune to come to real and proper conclusions. As already mentioned, we wanted to propose some working theories which we hope to be able to back up with such data as to make them more phytosociologically valid. We hope to do this by continuing to collect data and analyses of vegetational dynamism.

We do however confirm, as hypothesised as long ago as 1971, that the »fragno« is placed as a constructor species of forestal coenoses, from the higher area of *Quercion ilicis* to the band of *Quercus cerris*, occupying its own space, in substitution of the Mediterranean thermophile wood.

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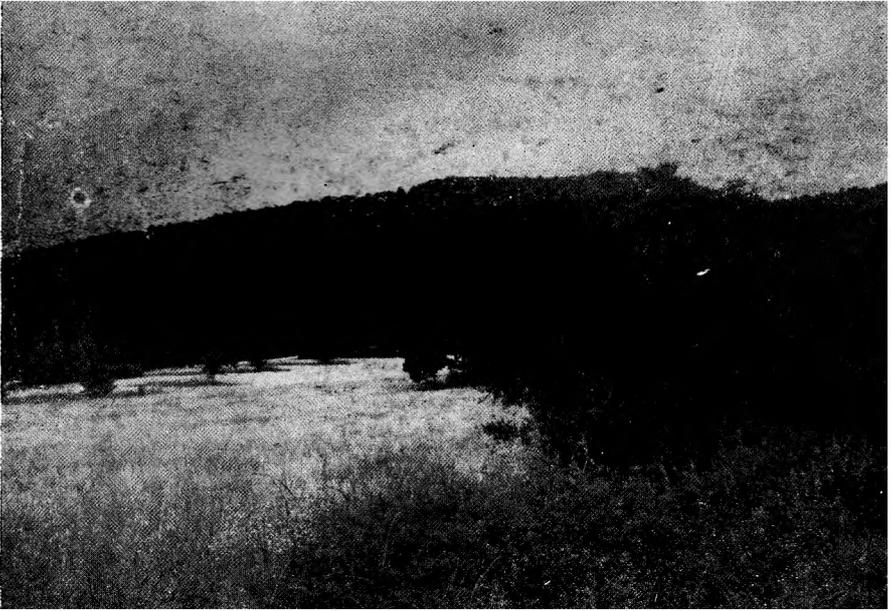


Photo 1. Remainers of wooded vegetation with *Quercus trojana* Webb in the country of Noci.



Photo 2. Woods with »Fragno« can still be found in the higher parts of Murge, while the cultivations have taken place in the level parts. But we can notice that big plants remain along the borders of the fields.



Photo 3. Bush ced as coppice and used for pasture.



Photo 4. The pastures reduce the arboreal vegetation and increase the herbaceous one, which increasingly acquires the characteristics of a meadow or of a pasture.

SAŽETAK

PRETHODNA FITOCENOLOŠKA INTERPRETACIJA VEGETACIJE S VRSTOM  
 QUERCUS TROJANA WEBB NA BREŽULJKASTIM TERENIMA IZMEĐU BARIJA  
 I TARANTA

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Na brežuljkastim terenima u području Barija i Taranta postoje još ostaci šuma s vrstom *Quercus trojana* Webb koje su nekad bile mnogo raširenije. Danas su zajednice s tim hrastom vrlo utjecajne te su razvijene kao šume panjače ili pak kao otvorene šumske sastojine koje se iskorištavaju kao pašnjak; radi se svakako o sastojinama koje je fitocenološki teško odrediti a da se ne prave hipoteze o onome što bi moglo biti umjesto onoga što jest.

Za početak se, uz naznaku pojedinih fitocenoloških jedinica predlaže klasifikacija sastojina s vrstom *Quercus trojana* Webb i mogući dinamizam na granici između sveza *Quercion ilicis* i *Quercion pubescentis-petraeae*.

Razred: *Quercetea ilicis*

Red: *Quercetalia ilicis*

Asoc: *Quercetum ilicis*

Subas. *quercetosum trojanae*

Asoc: *Quercetum trojanae*

Subas. *pistacietosum lentisci*

Subas. *quercetosum pubescentis*

Subas. *quercetosum cerris*

Subas. *quercetosum cocciferae*

Te sastojine mogu se i isprepletati stvarajući tako brojne prijelazne stadije. Naravno to su pretpostavke koje će naknadno biti istražene i provjerene.

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