Chorology of *Platanus orientalis* (*Platanaceae*) in Calabria (S Italy)

Giuseppe Caruso[1], Carmen Gangale[2], Dimitar Uzunov[2] & Lia Pignotti[3]

[1] Istituto Tecnico Agrario Statale "Vittorio Emanuele II", via V. Cortese 1, 88100, Catanzaro, Italy, e-mail: caruso_g@libero.it

[2] Museo di Storia Naturale della Calabria ed Orto Botanico, Università della Calabria. 87036 Arcavacata di Rende (CS), Italy

[3] Dipartimento di Biologia Vegetale, Università di Firenze, via G. La Pira 4, 50121 Firenze, Italy

Received: July 31, 2007 ▷ Accepted: September 27, 2007

Abstract: *Platanus orientalis* is a SE European and W Asiatic floristic element, with limited distribution in Italy (Sicily, Calabria, Apulia and Campania). The study summarizes the chorology of *P. orientalis* in Calabria based on literature, herbarium and field data. In the investigated territory, the species is distributed in central Calabria (Catanzaro Province), in six localities and twenty-eight stations, twenty-four of which unknown earlier. Some comments and considerations about the ecology, phytogeography and microchorology are presented.

Key words: Calabria (S Italy), chorology, *Platanus orientalis*

Introduction

Platanus orientalis L. (*Platanaceae*) – oriental plane, is a SE European and SW Asiatic floristic element. In Italy, where the species has the westernmost limit of its distribution, it occurs in Sicily, Calabria, Apulia, Campania (Conti & al. 2005), and has been recently excluded from Tuscany (Peruzzi & Uzunov in press). *Platanus orientalis* has conservation significance as a characteristic species for the habitat 92C0 – *Platanus orientalis* and *Liquidambar orientalis* woods (*Platanion orientalis*) (All. I dir. 92/43 CEE) = G1.38 [*Platanus orientalis*] woods (EUNIS), and is also included in the Italian Red Data List as a vulnerable species (Conti & al. 1997). It is an element of lowland riparian forests (Zangheri 1976; Pignatti 1982; Tutin & al. 1993), from 0 to 600 m a.s.l. (Pignatti 1982).

The species was reported for Calabria by Tenore (1831–1842), on the basis of specimens still stored in the Herbarium of the Università degli Studi di Napoli Federico II (NAP). Later on (1949), other specimens also deposited in NAP were collected by Pasquale. The only recent specimen, collected by Bernardo, Musacchio & Tripepi in 2002, was found in the Herbarium of Museo di Storia Naturale della Calabria ed Orto Botanico (CLU). Lack of recent data about the local distribution of this rare tree species at the limit of its distributional range has motivated the present work.

Material and methods

Calabria (Fig. 1) represents the southernmost part of the Apennine Peninsula. The mountain range is articulated in six major mountain massifs (Pollino, Orsomarso, Catena Costiera, Sila, Serre and Aspromonte), with different geological characteristics (the first two are calcareous and the others are siliceous). Accord-

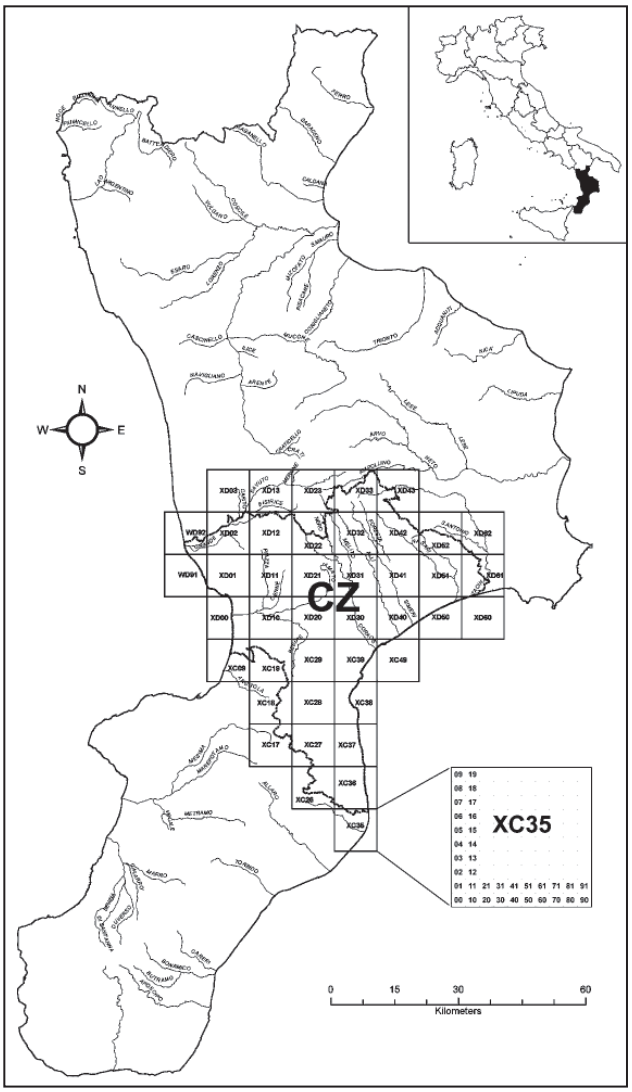

Fig. 1. Map of Calabria and Catanzaro Province (CZ), with 10 km and 1 km UTM (WGS84) grid.

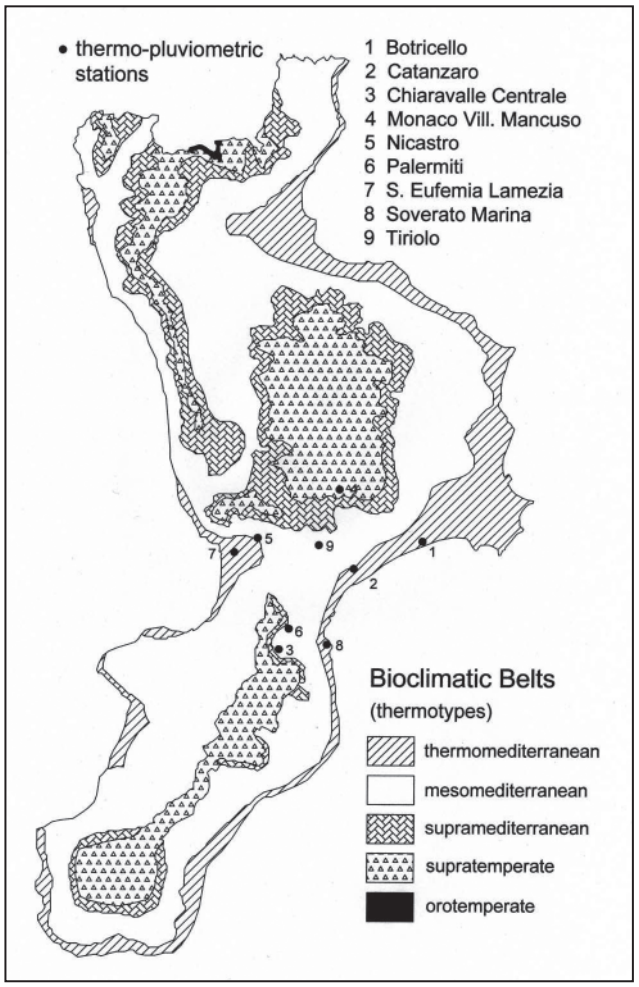

Fig. 2. Bioclimatic belts of Calabria (Spampinato 2003) and of the thermo-pluviometric stations in relation to *P. orientalis* populations.

ing to the geological and geomorphological structure, the region has a well-developed hydrographic net (36 main, 75 secondary and 591 elementary basins). The climate is typically Mediterranean, with local variation towards temperate in the mountains (Fig. 2). Climatic diagrams were built (Fig. 3) for thermo-pluviometric stations in the studied area.

The present study is based on literature, herbarium (W, WU, CAT, NAP, RO, FI, PAD e CLU) and field data. The field study (2000–2005) was organized in order to verify the existing data and to look for new stations on the basis of preliminary GIS analysis (applying ESRI ArcMap 9.0), considering the ecological characteristics of the species in relation to the environmental context (altitude, slope and hydrology). For final chorological representation, a UTM (WGS 84) grid of 1 km (Figs 1, 4) was applied. In order to define the geographic localization of the populations latitude, longitude and altitude are given. When available, the river and closest village designation are specified too.

Results and discussion

The herbaria research has shown that Tenore's record (1831–1842) for Calabria (Nicastro) was based on specimens still stored in NAP [*P. orientalis*, *Tenore*, 23.07.1827 Fiume Vatrano sotto S. Vito; *P. orientalis*, *Tenore*, 23.07.1827 Fiume Vatrano sotto S. Vito in Calabria; *P. orientalis*, *Tenore*, s.d., S. Vito in Calabria Fiume Vatrano, rev. *P. orientalis*, (Pasquale?), Nicastro]. According to Rohlfs (1990), the "Fiume Vatrano" of Tenore's label corresponds to Torrente Beltrame (Beltrame Stream), although later mistakenly interpreted as "Fiume Vescano" (Beguinot 1925). Af-

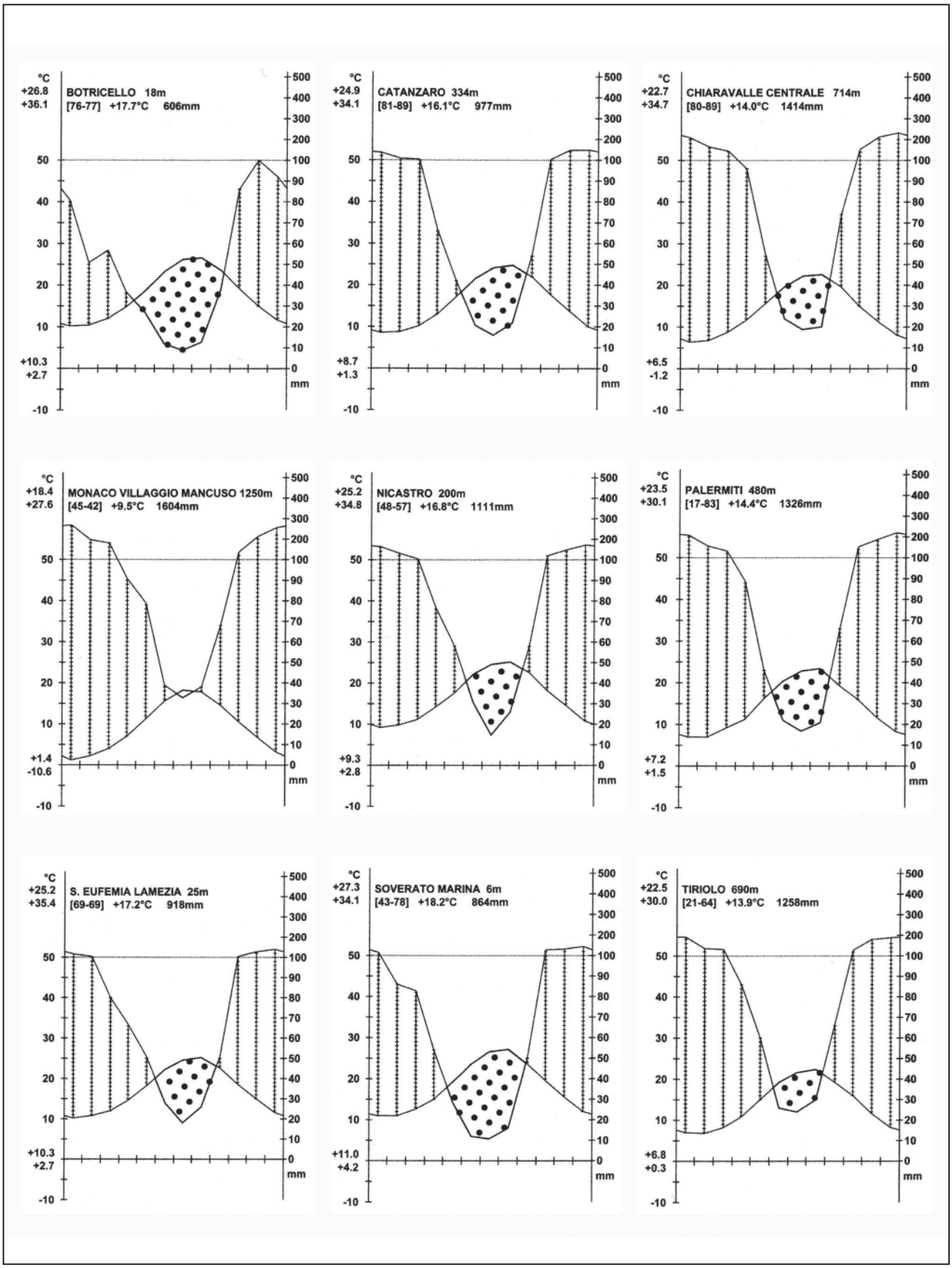

Fig. 3. Thermo-pluviometric diagrams, according to Walter & Leith (1960).

ter the publication of Tenore's work (1831–1842), other specimens from Calabria, also stored in NAP, were collected by Pasquale [*P. orientalis*, 27.06.1949 Ad rivulas et fluviorum oras. Sotto Filadelfia lungo la strada consolare, sul ponte della Madonna ove successe il conflitto tra ??? e i Calabri, rev. *P. orientalis*, ad rivulas et fluviorum oras, sotto Filadelfia, rev. *P. orientalis*, ad fluviorum oras. Curinga, Cortale]. A recent specimen is stored in CLU [*P. orientalis*, *Bernardo L.*, *Musacchio A.* & *Tripepi S.*, 01.06.2002 UTM 33XD 46.17 Loc. Melissaro (Sersale, Provincia di Catanzaro, Calabria)].

The present study shows that in Calabria, *P. orientalis* is distributed in the central part of the region, in six localities (basins) and twenty-eight stations (Table 1; Fig. 4). All stations are entirely inside the administrative borders of Catanzaro Province. Four of the six earlier known localities are confirmed (S. Vito sullo Ionio, Curinga, Cortale and Melissaro). Two have not been confirmed (Nicastro and Filadelfia) and twenty-four stations are recorded for the first time.

Table 1. Stations of *Platanus orientalis* in Calabria.

Nr.	Station	Basin	Alt.	Latitude/Longitude	status	pr. name	a.s.	ras
1	Campanaro	Uria	380	16°41'16"N, 39°00'45"E	new		s	+
2	Fosso Rupa	Uria	300	16°41'25"N, 39°00'04"E	new		s	+
3	Ervarulo 1	Uria	200	16°41'45"N, 38°59'27"E	conf.	Melissaro	s	+
4	Ervarulo 2	Uria	150	16°41'55"N, 38°58'52"E	new		s	+
5	Ervarulo 3	Uria	100	16° 42'19"N 38°58'37'E	new		s	+
6	Uria 1	Uria	80	16°42'35"N 38°57'58"E	new		s	+
7	Uria 2	Uria	60	16°42'33"N, 38°57'13"E	new		s	+
8	Curinga	Turrina	490	16°19'54"N, 38°49'26"E	conf.	Curinga	s	+
9	Cortale	Pesipe	620	16°23'17"N, 38°49'03"E	conf.	Cortale	s	+
10	Serralta	Pesipe	750	16°22'20"N, 38°54'26"E	new		s	+
11	Alessi	Alessi	80	16°31'56"N, 38°46'56"E	new		s	+
12	Piccarella	Beltrame	620	16°23'46"N, 38°44'28"E	new		s	+
13	Cenadi 1	Beltrame	680	16°24'02"N, 38°44'11"E	new		ns	–
14	Vallario	Beltrame	500	16°26'46"N, 38°43'51"E	new		s	+
15	Cenadi 2	Beltrame	500	16°24'01"N, 38°43'37"E	new		ns	+
16	Olivadi	Beltrame	450	16°25'15"N, 38°43'35"E	new		ns	+
17	Cenadi 3	Beltrame	450	16°25'17"N, 38°43'18"E	new		ns	+
18	S. Vito 1	Beltrame	400	16°24'41"N, 38°42'33"E	new		s	+
19	S. Vito 2	Beltrame	390	16°24'23"N, 38°42'31"E	new		s	+
20	Beltrame	Beltrame	350	16°26'56"N, 38°41'48"E	conf.	Vatrano	s	+
21	Servano 3	Beltrame	420	16°23'59"N, 38°41'3"	new		s	+
22	Servano 1	Beltrame	400	16°24'49"N, 38°41'35"E	new		s	+
23	Servano 2	Beltrame	380	16°24'12"N, 38°41'34"E	new		ns	+
24	Chiaravalle 2	Beltrame	470	16°24'03"N, 38°41'20"E	new		ns	–
25	Chiaravalle 1	Beltrame	450	16°24'09"N, 38°41'15"E	new		s	–
26	Ancinale	Ancinale	280	16°26'57"N, 38°39'57"E	new		ns	–
27	Torre Ruggiero	Ancinale	560	16°21'52"N, 38°39'21"E	new		ns	–
28	Gumi	Ancinale	500	16°20'48"N, 38°38'25"E	new		s	+
29	Filadelfia	Filadelfia	–	–	not conf.	Filadelfia		
30	Nicastro	Nicastro	–	–	not conf.	Nicastro		

Nr. = progressive number of the station; **station** = name of the station; **basin** = hydrographic basin; **alt.** = altitude; **new** = previously unknown; **conf.** = confirmed; **not conf.** = not confirmed; **pr. name** = previous name; **a.s.** = apparent spontaneity; **s** = spontaneous; **ns** = not spontaneous; **ras** = reproductive activity by seeds; **+** = positive; **–** = negative.

The species occurs mainly in riparian forests of *Populetalia albae* Br.-Bl. ex Tchou 1948, in the altitudinal range from 60 m to 750 m a.s.l. (Table 1). In some stations (13, 15, 16, 17, 23, 24, 26 and 27) the Oriental Plane was present in a rural context, close to villages and roads where it is doubtfully spontaneous. In the other recorded stations, the species is present in a natural environment and shows a good reproductive activity. In some places the species represented a frequently felled coppice, in order to produce poles and fire wood. The extinction of the species in some old stations (Nicastro and Filadelfia) is probably related to anthropogenic activity. Cutting wounds (Fig. 5) promote penetration of the Ascomycetes *Ceratocystis fimbriata* Hell. et Halsted inside the vascular system of the plant, which rapidly dies (Bergamo 2002). In spite of the human pressure and degradation of river ecosystems, Calabrian Oriental Plane population has also shown aged and monumental individuals (Fig. 6).

Platanus orientalis occurs in Calabria in twenty-eight stations (eight of which doubtfully spontaneous). This is a remarkable number, considering the rarity of the species. The stations are concentrated in the central part of Calabria. The plants occurring in the Beltrame, Uria, Alessi and Ancinale rivers basins live in apparently natural conditions, with active seed reproduction. The species wasn't found in two previously known localities, probably due to some anthropogenic activities instilling lethal fungal infections. Unfortunately, none of the found stations was actually included in the protected areas and this poses potential risk for long-term conservation of the species in Calabria.

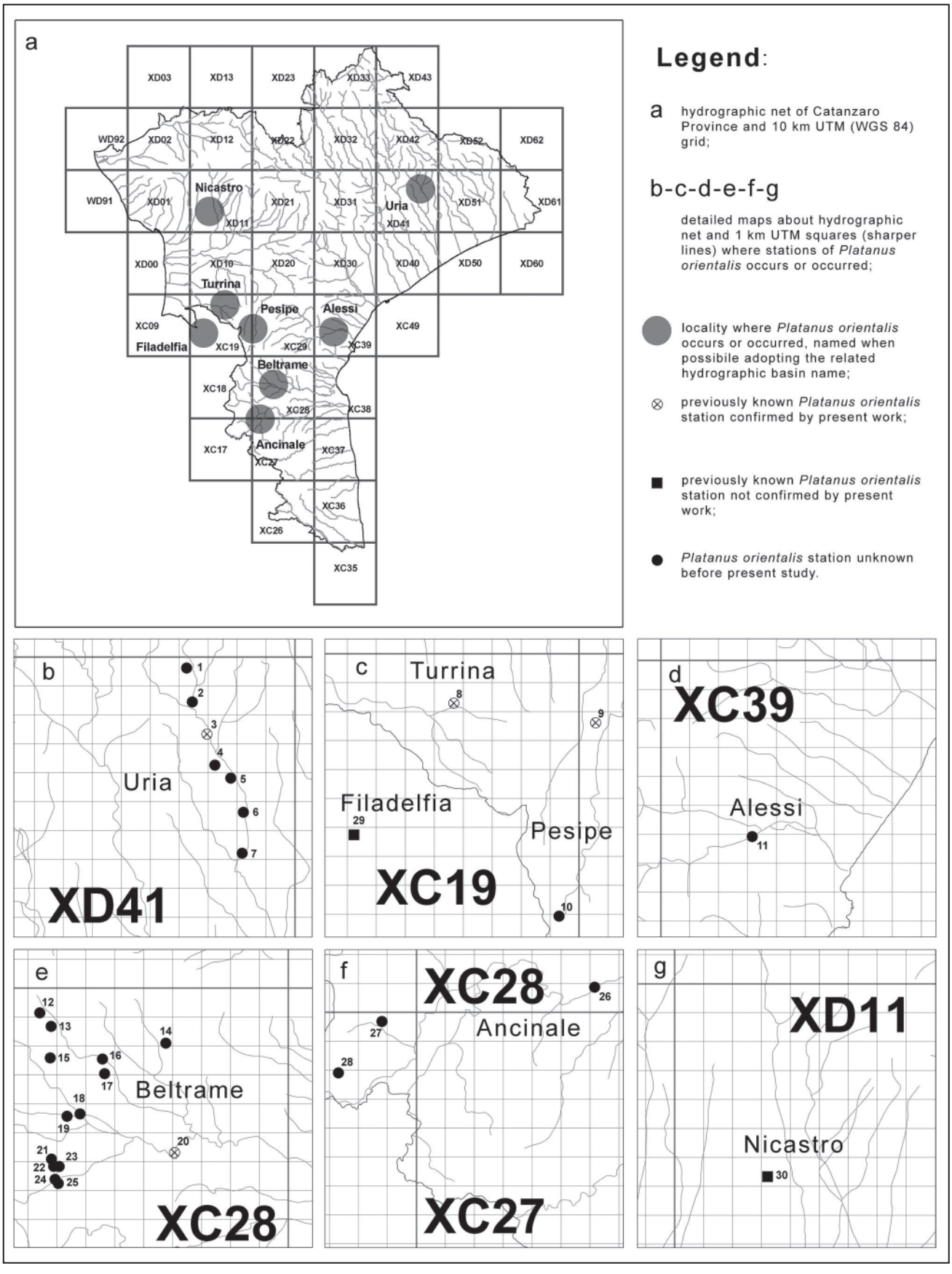

Fig. 4. Distribution of *P. orientalis* in Calabria.

Fig. 5. Shoots of *P. orientalis* in a felled coppice nearby Olivadi village.

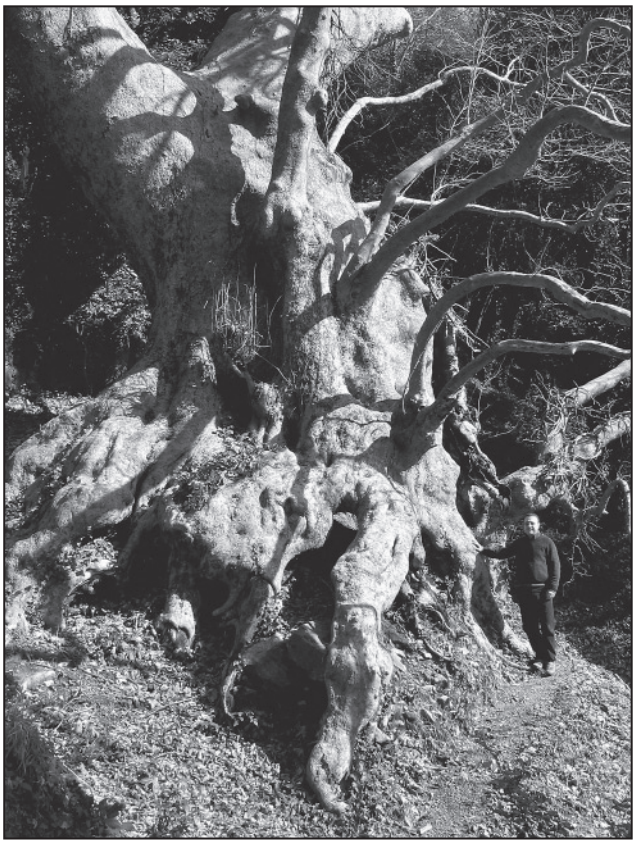

Fig. 6. The biggest oriental plane tree in Calabria (circumference 12.08 m at 1.3 m above the soil), in S. Elia Vecchio (Curinga municipality).

Acknowledgements. The authors are grateful to Dr Carmine Lupia for the help in field work in the Uria Basin area. Thanks are also extended to the curators of the visited herbaria, and especially to Dr. Annalisa Santangelo (NAP) for her help in consultation of the Tenore and Pasquale herbaria, as well as to the anonymous reviewer for the critical notes.

References

Beguinot, A. 1925. Osservazioni sull'indigenato del *Platanus orientalis* L. nell'Italia del sud e nella Sicilia orientale. – Boll. Reale. Ist. Bot. Modena, **1**: 1-18.

Bergamo, P. 2002. *Ceratocystis fimbriata* (cancro colorato del platano). Regione Lombardia – Servizio Fitosanitario Regionale. http://et2.unipv.it/ omp/ ceratocystis/ (accessed 24.05.2005).

Conti, F., Abbate, G., Alessandrini, A. & Blasi, C. (eds). 2005. An Annotated Checklist of the Italian Vascular Flora. Palombi e Partner, Roma.

Conti, F., Manzi, A. & Pedrotti, F. (eds). 1997. Liste rosse regionali delle piante d'Italia. CIAS. Camerino.

Peruzzi, L. & Uzunov D. In press. Notulae alla Checklist della Flora Vascolare Italiana: 1380. – Inf. Bot. Ital., **39**(2).

Pignatti, S. 1982. Flora d'Italia. vol. **1**. Edagricole, Bologna.

Rohlfs, G. 1990. Dizionario toponomastico e onomastico della Calabria. Longo Editore, Ravenna.

Spampinato, G. 2003. Diversità biologica delle foreste calabresi. – In: **Bevilacqua, F.** (ed.), Foreste di Calabria. Assessorato Foreste, Forestazione, Protezione Civile, Pari Opportunità. Regione Calabria.

Tenore, M. 1831–1842. Sylloge plantarum vascularium florae neapolitanae hucusque detectarum. Ex Typographia Fibreni, Neapoli.

Tutin, T. G., Burges, N. A., Chater, A. O., Edmondson, J. R., Heywood, V. H., Moore, D. M., Valentine, D. H., Walters, S. M. & Webb D. A. (eds). 1993. Flora Europea. Ed. **2,** vol. **1.** Cambridge Univ. Press. Cambridge.

Walter, H. & Leith, H. 1960. Klimadiagramm Weltatlas. G. Fisher, Jena.

Zangheri, P. 1976. Flora Italica. Vol. **1**. Cedam, Padova.