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The Palmae are one of the most important plant families, with great contributions to mankind. Their unique appearance, regular growth habit and adaptatibility to cultivation are remarkable, but their growth rates in cultivation are variable. This report examines the rate growth of palms in the Mediterranean basin in the town of Nauplio, Greece.

Palms have great potential for use in landscaping to give a tropical effect. The use of palms indeed can change the mood of a place, according to the specific mixture of plants deployed. They are suitable for symmetrical planting, in lines or rows, and as focal points at entrances, but their form and texture can also be combined with most other plants, so they can be used in mixed groupings (Sayan 2001). Most palms are low-maintainance, which is why, in most cases, they are successful in a variety of horticultural uses. Palms can easily adapt to new conditions as long as the climate is warm and the soil is moist but well drained (Brickell 1996). According to Bouchair (2004), palm trees can modify their microclimate and can shade the ground surface, thereby causing a reduction

1. Aerial view of Park of O.S.E.

in the ambent temperature, with the added advantage of cooling by evapotranspiration through the leaves.

Only two palms are native to Greece. *Phoenix theophrasti* is known from the Greek islands of Crete (Vai, Preveli), Nisiros, Karpathos, Kos and Santorini. *Chamaerops humilis var. humilis* has been reported from Pachia Ammos, Crete (Greuter 1968). According to Thymakis (2003a), in ancient times, on the plain of Argos, in Mycines and in Nauplio, there were many plants of the native *P. theophrastii*; however, today, most of the palm species that are found in Nauplio are exotics that have been introduced due to the mild climate.

Palms are ideal subjects for demographic studies, as they are easy to identify at all stages of their growth, their fruits are readily visible and easily quantified and leaf scars provide an index of age (Tomlinson 1979). The present paper analyses the rate of growth of palm trees in Nauplio, a town in southern Greece, which occupies a sheltered area with highly specific microclimate conditions. Although the first palm trees in the modern city of Nauplio were established in 1930, little is known about the growth and the successional behaviour of palm species in Nauplio, or in Greece generally. The aim of this study was to examine palm growth rates, which may apply to palms cultivated elsewhere in the Mediterranean Basin.

Methods

Nauplio is an area with gentle, mild temperatures. The mean annual temperature is 18.7ºC, with July being the warmest month and January being the coolest one. The mean annual rainfall is 510.1 mm, with low points during the summer time. Nauplio lacks strong winds, winter frosts and summer draughts, which occur in many other places throughout Greece. Thus, Nauplio has specific microclimatic conditions that make it appropriate for the cultivation of palms. The palms selected for this study (Tab. 1) are those growing in the four borders along the Old Interchange, which is called the Park of O.S.E (Fig. 1). The study site area is 10 ha.

All of the palms that were found were recorded. We measured the height of single-stemmed palms from the ground (or the top of the root mass) to the bottom of the sheathing leaf base (where the lowest live leaf was attached to the stem). In other words, only the trunk measured, and neither the crownshaft nor the crown was included in the height measurement. We used a measuring rod that was graduated in centimeters (Hastings Tools & Equipment, Hastings, Michigan), which telescoped to 750 cm, supplemented with a measuring tape where necessary. Age was determined from the year in which the plants were transplanted into the park. We also recorded the diameter at breast height (DBH). In the clustering palm trees, we measured only the central stem. The stem height (current height – height at planting) was divided by the age of the palm to give the growth rate, which was expressed in centimeters per year.

Fig. 2 (left). *Syagrus rommanzoffiana*. Fig. 3 (right). *Caryota urens*. Fig. 5 (below). *Bismarckia nobilis*.

Phoenix dactylifera, which occurs in the park, was omitted from our study, as we have no records of when or at what age it was planted in the park.

Results and Discussion

In the first column of Tab. 1, we give the botanical names of the different species that have been planted in Nauplio since 1930. In the second, the age of each plant is given. In the third, there are the heights of the trunks at the time of transplanting. In the fourth column is the present height of each trunk. In the fifth column we give the diameter at breast height (DBH) of the palm trees. In column six are the numbers of stems plants, and in column seven are the calculated growth rates for each trunk or plant.

As noted by Zona and Maidman (2001), reference books may give palm growth rates in relative terms, such as "slow" or "moderately fast," but actual growth rates are seldom reported. In interpreting the growth rates given in Table 1, the caveats of Zona and Maidman (2001) must apply. First, these growth rates are lifetime average. They do not take into account

the pre-germination period, establishment phase, during which a seedling palm may form no above-ground stem, and the variation in growth rate over the life of a palm, which may grow quickly as a juvenile but slowly as a reproductive adult. Secondly, these rates are taken from individual palms growing in Nauplio and might therefore not be typical, although they might be applicable to plants growing under similar ecological conditions in the Mediterranean Basin.

Table 1. The growth rate of palm trees in Nauplio

Species	Age (yrs.)	Initial (cm)	Height 2005 (cm)	DBH 2004 (cm)	n	Growth rate (cm/yr)
Archontophoenix cunninghamiana (*)	15	40	100	10	1	4.0
Arenga engleri	9	60	200	17	1	15.5
Bismarckia nobilis	5	10	12	8	3	0.2
Brahea armata	15	40	100	20	3	4.0
Brahea edulis	15	40	100	20	1	4.0
Butia capitata	15	10	50	25	2	2.7
Caryota urens	7	50	300	7	2	35.7
Caryota "himalayana"	5	10	50	3	3	8.0
Chamaedorea seifritzii	12	80	150	4	1	5.8
Chamaerops humilis	15	50	200	13	15	10.0
Howea belmoreana	7	100	120	8	1	2.9
Livistona australis	15	20	80	10	3	4.0
Livistona chinensis	15	20	250	12	1	15.3
Livistona decora	5	10	30	12	3	4.0
Phoenix canariensis	75	100	700	67	30	8.0
Phoenix dactylifera	-			80		
Phoenix reclinata	10	20	100	80	5	8.0
Phoenix roebelenii	15	20	200	11	11	12.0
Phoenix theophrasti	10	10	30	9	3	3.0
Pritchardia lowreyana	5	10	15	4	1	1.0
Ravenea rivularis	7	10	30	10	1	2.7
Rhapis excelsa	15	50	180	3	5	8.7
Rhopalostylis baueri	15	10	30	4	1	1.3
Sabal causiarum	15	10	70	14	3	4.0
Sabal palmetto	15	10	70	20	2	4.0
Syagrus romanzoffiana	13	50	500	14	7	50.0
Trachycarpus fortunei	13	30	300	16	15	20.8
Washingtonia filifera	75	50	1500	60	36	19.3
Washingtonia robusta	75	50	2500	45	5	32.7

(*) Pot planted

Our results indicate, not surprisingly, that considerable variation exists in the average growth rates of different species of palms. The three fastest palms are *Syagrus romanzoffiana* (Fig. 2), *Caryota urens* (Fig. 3) and *Washingtonia robusta*; the three slowest palms are *Bismarckia nobilis*, *Rhopalostylis baueri* and *Butia capitata*.

We draw several conclusions from our data. *Caryota urens* has made rapid growth and appears suitable for use in urban landscapes in Greece. *Bismarckia nobilis* (Fig. 4) is slow-growing, even when young, but this palm has become very popular in recent years (Thymakis 2003b). *Phoenix theophrasti* (Fig. 5)has shown slow growth in Nauplio, as in Crete, where it is an endangered species. *Livistona chinensis* (Fig. 6) grows more rapidly than other *Livistona* species and could replace the often-used *Washingtonia* species (Fig. 7) in urban landscapes. The success and the rapid growth of *Phoenix roebelenii* (Fig. 8)and *Rhapis excelsa*

5 (top). *Phoenix theophrasti.*

6 (middle). *Livistona chinensis.*

7 (bottom). *Washingtonia* species lines a street.

(Fig. 9) are remarkable and suggests that they could be used more often in Greece (Thymakis 2003b). Also, several unusual palm species for the Mediterranean region, such us *Archontophoenix cunninghamiana, Pritchardia lowreyana, Ravenea rivularis, Sabal causiarum,* have done suprisingly well under these specific conditions.

Growth rates are governed by the interplay of genetic factors and external factors, such as availability of light, water, nutrients, etc. (Zona & Maidman 2001). Nevertheless, we hope these data will give growers of palms some idea of the growth rates that can be expected for these species and that the data will encourage the cultivation of a greater number of palm species. Our results describe which tropical plants are the most tolerant, the most easily adaptable and fastest growing under warm Mediterranean conditions.

Literature Cited

BOUCHAIR, A. 2004. Decline of urban ecosystem of Mzab valley. Building and Environment 39: 719–732.

BRICKELL, C. 1996. Encyclopedia of Garden Plants. Dorling Kindersley, London and New York.

GREUTER, W. 1968. Le dattier de Theophraste, specialite cretoise. Musée Genève. Genève.

TOMLINSON, P.B. 1979. Systematics and ecology of the Palmae. Ann. Rev. Ecol. Syst. 10: 85–108.

SAYAN, S.M. 2001. Landscaping with palms in the Mediterranean. Akdeniz University. Antalya, Turkey.

THYMAKIS, N. 2003a. The Cretan Date Palm (*Phoenix theophrasti*). The Mediterranean Garden 32: 32–34.

THYMAKIS, N. 2003b. The use of palms in Greece. The Mediterranean Garden 33: 54, 55.

ZONA, S. AND K. MAIDMAN. 2001. Growth rates of palms in Fairchild Tropical Garden. PALMS 45: 151–154.

Fig. 8 (left). *Phoenix roebelenii.* Fig 9 (right). *Rhapis excelsa.*