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## A New Locality for Phoenix in Turkey: Gölköy-Bödrum

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### ABSTRACT

Until recently, the two native stands of palms in Turkey were known to be of *P. theophrasti* Greuter in the Datça Peninsula, and Kumluca-Karaöz in Finike Bay. A new locality for *Phoenix* in Turkey is now reported at Gölköy, north of Bodrum. In certain of its characteristics this new population differs from *P. theophrasti*. In this article the identity of Gölköy palm and its conservation status are discussed.

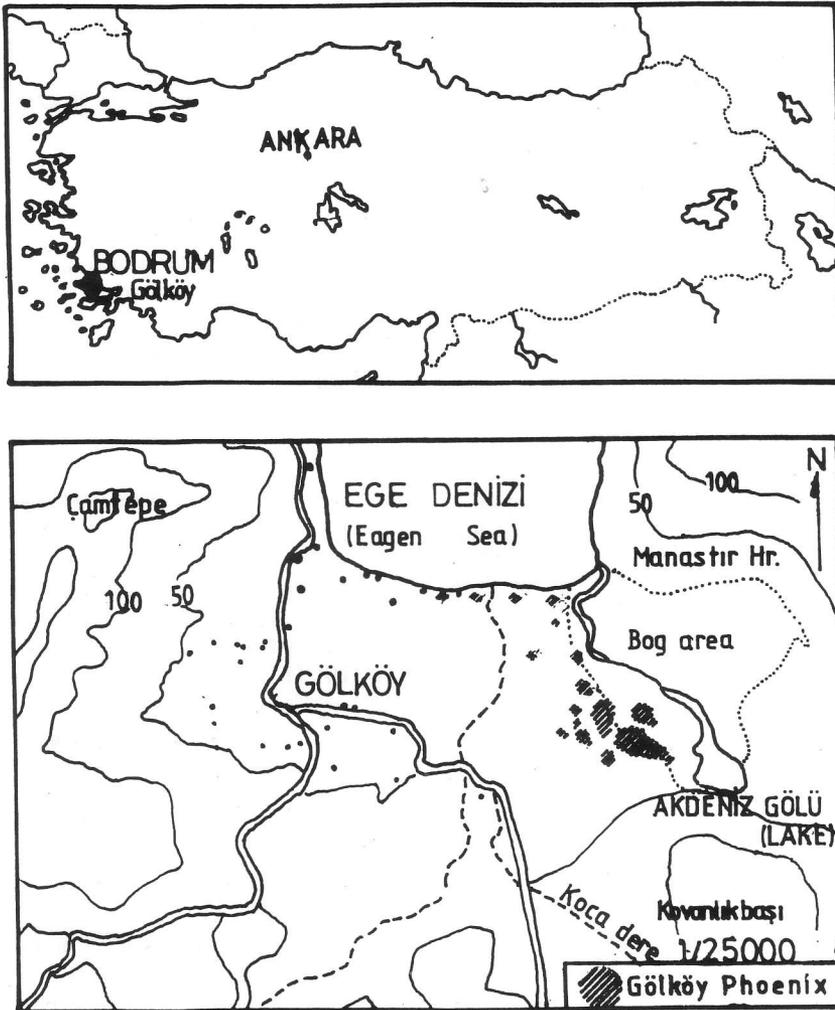
Natural stands of *Phoenix theophrasti* Greuter were first discovered in Turkey in 1982 (Boydak 1983, Boydak and Yaka 1983, Boydak 1985), in the south-west of the country in the Datça Peninsula. Boydak predicted that further populations of *Phoenix* would be found in Turkey, and sure enough three years later a second locality was recorded, a long way from Datça, at Kumluca-Karaöz in Finike Bay (Boydak 1986, 1987). A third Turkish population of *Phoenix* has recently been found at the village of Gölköy, north of Bodrum.

The *Phoenix* population has been known to the inhabitants of Gölköy for hundreds of years. In 1989 A. Bayraktar and I. Aslanboga (Professors of Landscape Architecture) visited the Gölköy palm population and considered it to be representative of *P. theophrasti*. In the early summer of 1990 one of the authors, M. Boydak, made the first of several trips to Gölköy and immediately noticed several distinct differences between the Gölköy palms, *P. theophrasti* and *P. dactylifera*. Samples were sent to the Royal Botanic Garden, Edinburgh (December 1990) and Royal Botanic Gardens, Kew (July 1993). In April 1994 both authors visited the Gölköy population and the two native stands of *P. theophrasti* in Datça and Kumluca-Karaöz in Finike Bay and collected further herbarium material.

*Phoenix theophrasti* was described by Greuter in 1967, from the famous grove at Vai in Crete. It is now known from nine coastal localities on that island (Turland et al. 1993), where it can be found growing along moist valley floors, stream banks, by springs, on coastal rocks and cliffs, in all cases by the sea, from 0–230 m altitude. Greuter (1967) noted that the “Cretan Date Palm” had been known since Classical times, when it was recorded in the writings of Theophrastus. Further records were made of the palm by travellers to the region in later times (e.g. Leake 1835, Kirchner 1875). Many considered it to be an escaped cultivar of the Date Palm, *P. dactylifera* L. (Langeron 1927). However, Greuter (1967) considered the Cretan palm to be a distinct species, and he named it *P. theophrasti* in honor of the Greek botanist-philosopher.

Greuter’s formal taxonomic description of *P. theophrasti* did not end the confusion between this species and the cultivated Date Palm. The two species certainly can appear similar, especially when *P. dactylifera* has been left untended, and when there are no flowers or fruit present. This confusion probably accounts for reports of *P. theophrasti* on other Aegean Islands, such as Kalimnos, Nisiros and Simi. These palms are likely to be *P. dactylifera*.

*P. theophrasti* is distinguished from *P. dactylifera* by its upright fruit clusters, and small inedible fruits (Greuter 1967, Anon. 1983). Turland et al. (1993) note *P. theophrasti* to have leaves which are smaller, shorter and sharper than those of *P. dactylifera*. The *Phoenix* populations of Datça and Kumluca-Karaöz match the description of *P. theophrasti* of Crete, and so they are included under that name. Certain morphological characteristics of the Gölköy palm make it less



1. A map to show the locality of the palm grove at Gök köy, near Bodrum, Turkey.

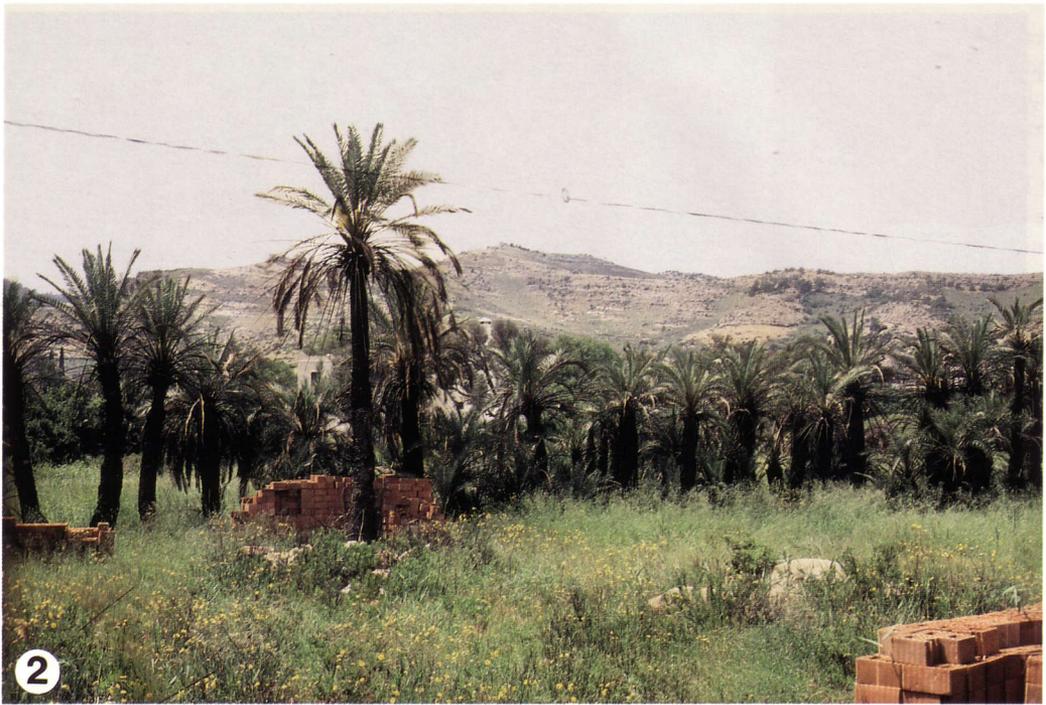
easy to name than the other Turkish palm populations. This new population of *Phoenix* is found growing on boggy ground on the boundaries of the fast-growing village of Gök köy, between patches of *Pinus brutia* Ten. and the sea. Several palms are now included within the gardens of newly-built houses. The main stand of palms covers an area of approximately one hectare bordering the village. However, palms can be found in smaller outlying groups or individual clumps over an area roughly six times this size, from the village across the flat land to the sea (700–800 m away).

On first seeing the population, so close to the village, one cannot help but ask if it is natural, as opposed to being the remnants of a cultivated palm

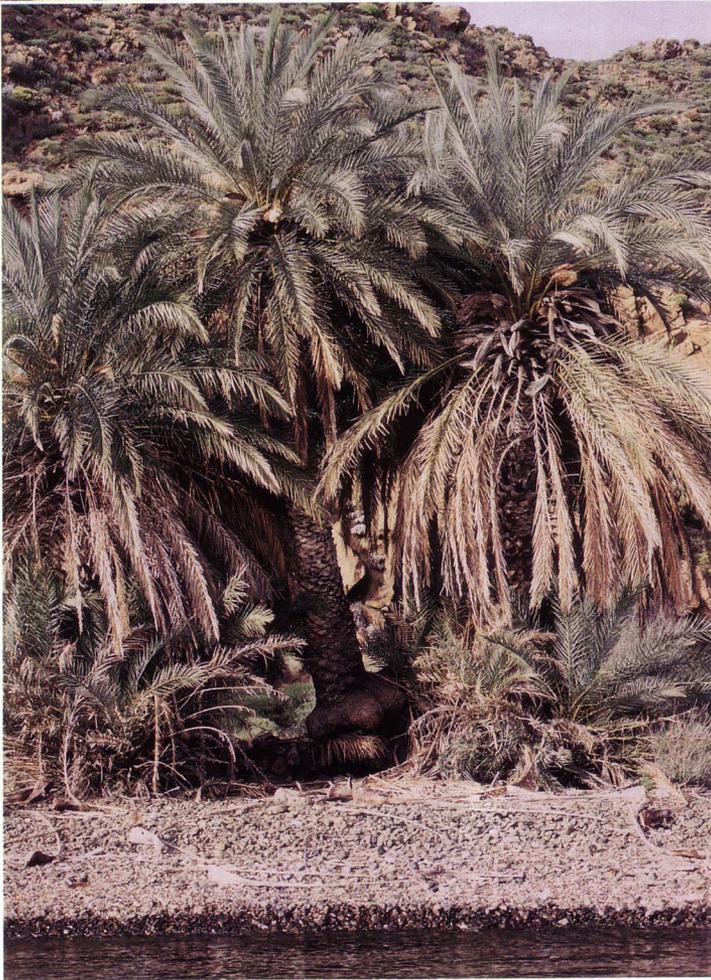
grove. There are reasons to believe that it could be native. Firstly, the palms yield small fruit that are slightly sweet, but scarcely fleshy, and it seems very unlikely that they were planted as a fruit crop. Alternatively, it might have been the leaf or leaf-base fiber that was the desired crop, but no local records support this. Secondly, the population is well established and is regenerating successfully by both suckers and seedlings.

### The Identity of the Gök köy Palm

The Gök köy palm differs from *P. theophrasti* in terms of its fruiting stalk length, fruit size and seed shape. Gök köy fruit stalks are 0.6–2 m long,



2. A view of the Gököy *Phoenix* palm population growing amongst piles of bricks: evidence of the expanding tourist village close by. 3. A cluster of scorched palm trunks at Gököy. The suckers at the trunk base are an indication that the palms are recovering well from the fire of 1993.



4. *P. theophrasti* growing along remote beaches and in rocky gullies of the Datça peninsula, Turkey. 5. *P. theophrasti* in full staminate flower, Datça peninsula, Turkey.

whereas those of *P. theophrasti* rarely exceed 0.3 m, and they hold fruit that is marginally larger. Although the Gök köy palms grow on a fertile plain site, their height, at 4–8 m, is generally shorter than that of *P. theophrasti* of Datça and Kumluca-Karaöz where some palms up to 17 m can be seen. The scanty flesh of the fruits of the Gök köy palm have a slightly sweet taste, reminiscent of the cultivated date. It seems then that there are differences between the Gök köy palm and *P. theophrasti*, the issue to be determined now relates to how we should interpret and acknowledge these differences. Do they indicate that the Gök köy palm is a new species, or a variety of *P. theophrasti* or *P. dactylifera*, or is there some other explanation?

The characterization of the various species of *Phoenix* is difficult at the best of times, due to the distinct lack of obvious differentiating characters, and the ready hybridization with each other. Throughout the natural range of *Phoenix* and its range of cultivation, intermediates between the species can be found. It is often a difficult, and perhaps impossible, task to discover their parentage. It cannot be ruled out that hybridization has played a role in the origin of the Gök köy palm. If it is of hybrid stock, then what are the possible parents? *P. theophrasti* is a sure contender for one parent, since it shares the characters of a clustering habit and upright fruit clusters with the Gök köy palm. The sweetness of the Gök köy fruits could point to *P. dactylifera*, which has been cultivated in the Aegean region for many years, as the second parent.

A preliminary anatomical study of the leaflets of the two Turkish populations of *P. theophrasti*, the Gök köy palm and samples of non-Turkish *P. dactylifera* have provided some useful and interesting results. All three palms are grouped together by the presence of large bundles of non-vascular fibers in the mesophyll layer of the leaflets. Very small groups of fibers are occasionally found in the leaf mesophyll of other species in the genus, but they are never so abundant or in large bundles. Anatomical data clearly indicates a close relationship between *P. dactylifera*, *P. theophrasti* and the Gök köy palm, though further sampling is required before the exact nature of their relationships can be understood.

At present therefore, there is no answer to the Gök köy problem, but further study of the morphology, anatomy and DNA of *P. dactylifera*, *P. theophrasti* and the Gök köy palm is included within

a three year study of the whole genus by S. Barrow at the Royal Botanic Gardens, Kew. It is hoped that the study of the chloroplast DNA will help to provide answers to the many questions about relationships within the genus. However, even if differences are discovered between the DNA of the three Turkish *Phoenix* populations, there is still the problem of how to interpret them. It is important that they are interpreted against the background of variation in *Phoenix* as a whole. New species or varieties of *Phoenix* cannot be described without reference to the rest of the genus, and therefore the Gök köy grove cannot be formally named until all *Phoenix* species have been studied to the same level. For example, *P. reclinata* in Africa shows wide morphological variation and yet is currently held under a single name on account of its pointed male flowers. If the Gök köy grove is described as a new variety, and the DNA variation between the various forms of *P. reclinata* is found to be as great or greater than that between the Gök köy grove and *P. theophrasti*, there would be strong grounds supporting the description of several new varieties of African *Phoenix*. Now we are entering the shaky ground of determining the concept of a species in *Phoenix*, a subject perhaps best left for another day!

Whatever decisions are made about the history, nature and name of the Gök köy *Phoenix*, there is no doubt that the population is of great importance as a natural palm grove in Turkey, and therefore it is imperative that positive action is taken to ensure its conservation.

### Conservation of the Gök köy Grove

There is considerable local interest, and a certain amount of pride, in the Gök köy palms, but unfortunately this may not be enough to protect them against the two major threats of water drainage and fire. Tourism has become an important source of income for the local people, and there is growing pressure to expand the village with new summer housing and tourist facilities (Fig. 2). The Gök köy palm grove occurs within a nature conservation area and therefore any activities that might alter the natural balance of the ecosystem are forbidden. Despite this, plans are afoot to drain the bog area, in which the palms grow to accommodate the inevitable golf course. A drainage trench surrounding the whole area is now in place. Before its construction, the boggy ground was completely flooded for several months each year.

Since the construction of the drainage trench certain parts of the palm grove are inundated with water for only 2–3 months annually. The water-relations of *Phoenix* are little understood, but it is clear that many of the species require an environment that is either permanently or seasonally flooded, and therefore the drying out of the bog could be disastrous for the Gököy grove.

Gököy, meaning "lake village," is named after the lake that borders the palm grove and village. Thankfully, several abundant springs feed the lake, and therefore it should be impossible for the drainage ditch to dry out the bog completely. However, the sinking of the water-table will have an adverse impact on the local ecosystem and this, in turn, could affect the well-being of the palm grove.

As to the other threat, in June 1993, Turkish T.V. reported that a fire, purpose-lit to clear land for development, got out of control and spread to a part of the Gököy palm grove (Fig. 3). Initially, it was suggested that many palms had been destroyed, and certainly many blackened stumps can be found amongst the surviving palms. Fortunately, our recent observations show the grove to have recovered well, and perhaps even to have benefited, from the fire. All palms in the main stand have charred, scorched trunks, but most show a healthy abundance of suckers sprouting at the base. Many of the palms were flowering during our visit, and throughout the grove, seedlings can be found, evidence of successful fertilization of the female flowers over the last few years. *Phoenix* is obviously living up to its name-sake: rising from the fire!

If fire was the only threat facing the palms, then the grove might be considered relatively safe. However, the combined threats of fire and drainage of the bog convey an increasingly vulnerable conservation status upon the grove, since there is little real control over the rate of expansion and development of the village. Certain outlying parts of the *P. theophrasti* population at Finike Bay (Kumluca-Karaöz) is similarly threatened by the growing tourist village nearby, though fortunately the bulk of this population, growing on top of steep, calcareous cliffs, and down their sides to the sea, occurs in areas unsuitable for housing development. The various stands of the species in the Datça Peninsula are, at present, also safe due to their occurrence in either steep, rocky gullies, or along remote, uninhabited beaches.

It is our opinion that conservation action must be focused soon upon the Gököy *Phoenix* grove,

not only because it represents one of only three native palm stands in Turkey, but also because the identity of the palm is not yet clear. Therefore, in 1993 M. Boydak applied to local and city governors requesting effective protection measures for the Gököy grove, including a ban on the water drainage scheme and expansion of the village into the palm population. Unfortunately, the necessary measures have not yet been implemented, but the attempt to realize positive action to ensure the conservation of the Gököy grove continues.

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