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## A NEW OAK ON MOUNT TAMALPAIS

by Stephen K. Langer

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Mount Tamalpais and its vicinity, in southern Marin County, California, are the home of twelve taxa -- species and variants -- of the genus *Quercus*. There are few places in California where so many different types of *Quercus* can be found. Some of the taxa are common and widespread; others are more limited in range. The most widely found oaks are *Q. agrifolia*, which is the most common oak in the region; *Q. chrysolepis*, which is found mainly at higher elevations; and *Q. wislizenii* var. *frutescens*, common in areas of chaparral.

Other oaks found in the region, though somewhat limited in range, are *Q. kelloggii*, found mainly north of the mountain near Fairfax and some of the lakes; *Q. garryana*, found locally in some areas north of the mountain; *Q. lobata*, usually found in sheltered valleys north and northeast of the mountain; *Q. durata*, restricted to serpentine soils; *Q. berberidifolia*, found on scattered sites; and *Q. parvula* var. *shrevei*, which is locally common in cooler habitats, but mainly on the north slopes of Mount Tamalpais above an elevation of 500 meters. Several hybrids have been noted (Howell 1949, 1970), the most common of these being *Quercus* x *morehus* (*Q. wislizenii* x *Q. kelloggii*).

Howell (1949) did much study on the oaks in Marin county, especially around Mount Tamalpais. He apparently felt that the shrubby chaparral form of *Q. wislizenii* (var. *frutescens*) was worthy of specific rank, and suggested using the name *Q. parvula*. Evidently, then, he considered the names to be synonymous, as had most California botanists.

In 1985, I received a copy of an unpublished thesis, by Kevin C. Nixon, regarding *Q. parvula*. Nixon commented that finding pure *Q. parvula* var. *shrevei* on Mt. Tamalpais would be somewhat difficult because *Q. wislizenii frutescens* grows there and the two taxa are known to hybridize. This is true where the two oaks do meet. However, having done extensive field surveys on the mountain since 1987, I have found many sites with pure *Q. parvula* var. *shrevei*. Most of these sites are located on the north side of the mountain, where this entity seems to be common.

*Quercus parvula* var. *shrevei* (Table 1) is closely related to *Q. parvula* var. *parvula*. The latter is found in Santa Barbara County on Santa Cruz Island and a few mainland sites. *Quercus parvula* var. *parvula* is mainly a shrub growing to 2.5 meters tall. *Quercus parvula* var. *shrevei* becomes a tree up to 23 meters tall though it can be a large shrub near areas of chaparral. Both variants have dark-green leaves, lanceolate to oblong, usually with entire margins, but the mainland forms tend to have longer leaves.

On April 27, 1991, while mapping sites for *Q. parvula* var. *shrevei* on the north slope of Mount Tamalpais, Charles S. Rand and I came upon a population of tall shrubby oaks that looked different from any we had seen before. These were growing as an understory beneath larger trees. Their leaves got our attention. In shape and color they were similar to those of *Q. parvula* var. *shrevei*, but the margins were different, being conspicuously attenuo-dentate. Also, they seemed to be longer, averaging around

10 to 12 centimeters. The longest leaves were mainly on the lower limbs, where a few measured as long as 16 centimeters.

Since the original site was found, many other aggregations of this oak have been located, mainly on the north side of the mountain. There are also a number of sites on the south slope and on ridges south of the mountain. The majority of the sites were between 500 and 700 meters; a few plants were seen at an elevation as low as 100 meters.

The new oak normally grows as understory in shaded woodland. Its main associates are *Pseudotsuga menziesii*, *Torreya californica*, *Quercus parvula* var. *shrevei*, *Q. chrysolepis*, *Arbutus menziesii*, *Umbellularia californica*, and *Lithocarpus densiflorus*. On occasion it grows with *Q. agrifolia* or *Sequois sempervirens*. The most common shrub associate seems to be the shade-tolerant *Oemleria cerasiformis*; *Arctostaphylos glandulosa* and *Vaccinium ovatum* were seen on some sites. *Quercus wislizenii* var. *frutescens* is occasionally nearby, but because it is not tolerant of shade, it is seldom found mixed with the new oak.

The new oak populations, with very few exceptions, are growing in shade. This is unusual with oaks; most species require full light for best growth. Where the new oak grows in full light, it seems to struggle. Most of these new oaks are large shrubs, generally 3 to 5 meters tall.

At first, I believed the new oak might be a hybrid between *Q. parvula shrevei* and some other species. But after further study, and after professor John M. Tucker, of the University of California at Davis, assessed the populations with me in the field, this idea was dismissed. The new oak showed no distinctive character combination referable to possible hybrid parents. It was concluded, therefore, that the new oak must be a variant of *Q. parvula*.

***Quercus parvula* Green var. *tamalpaisensis* Langer var. nov.**

A *Quercus parvula* var. *parvula* et a *Q. p.* var. *shrevei* differt foliis plerumque grandioribus et margine conspicuo attenuo-dentatis. Magis fruticosa quam var. *shrevei*.

Common name: Tamalpais Oak

Holotype: DAV 124549 - S. K. Langer October 10, 1992: International Trail, about 0.5 mile northwest of Ridgecrest Boulevard, just southeast of junction with Northside Trail, north slope of Mount Tamalpais, Marin County, California, USA, elevation 610 meters.

Description: Erect shrub to 6(7) meters tall; one to many trunks; mature bark ridged to furrowed, grayish to reddish-gray brown; young twigs greenish-brown and puberulent, becoming brown and glabrous when mature; buds narrowly ovoid to fusiform, (4)6 - 9 (13) mm long, light brown to (infrequently) reddish-brown, tips of bud scales with silky pubescence; leaf blades (50)80 - 120 (160) mm long, elliptic (often narrowly so) to (rarely) obovate, leathery, glabrous at maturity, dark green above lighter beneath, margins attenuate-dentate, teeth commonly aristate; petioles (2)5 - 15 (19) mm long; staminate catkins 20 to 60 mm long; pistillate flowers in pairs or solitary, subsessile or on short peduncles; acorns maturing in two season, 15 to 30 mm long, oblong to barrel-shaped, with blunt tips, occasionally

tapering, reddish-brown to dark brown with age; cups reddish-brown, covering one third to three quarters of the fruit, scale tips (especially upper scales) acute, rarely obtuse. Blooming occurs March to April.

The new oak is found mainly on the north slope of Mount Tamalpais, with additional populations, on the south side, in Redwood Creek drainage, on the ridge east of Pan Toll campground, and on the ridge west of Mill Valley. North of the mountain, Professor Tucker has discovered a few populations along Kent Pump Road, north of Lake Alpine Dam; two populations on Pine Mountain Ridge; and one on Green Hill, which is part of San Geronimo Ridge. The last three are the northernmost so far known. The estimated number of individuals is 1500 to 2000. The taxon is considered rare because of its small range. With few exceptions, it is only on public land.

*Quercus parvula* var. *tamalpaisensis* differs from both the nominate variety and var. *shrevei* of *Quercus parvula* in foliage, size of acorn, and shape of scales of the acorn cup (see Table 1). The main difference is in the leaves. The leaf margins of the new oak are consistently attenuate-dentate whereas those of the two other varieties of *Quercus parvula* usually are smooth, and dentation, when present, is different. The shrubby form of *Quercus parvula* var. *shrevei* may have leaves with spiny margins, but the teeth are not so pronounced and are not attenuate. On the average, the leaves of the new oak are longer. The longest leaves are usually found on the lower parts of the plants, but long leaves have been seen on the upper branches. Acorn cups are another point of difference. The scales of the other two varieties of *Quercus parvula* have acute tips; the acorn scales of the new oak are not so acute, and their color is lighter. Acorns of the new oak are generally, slightly smaller. Winter buds are a little longer, being up to 13 mm.

Size, too, is a point of difference. The new oak is a tall shrub; its average height seems to be between 3 and 5 meters although there are specimens 6 meters tall south of Azalea Meadow, and one of 7 meters -- the tallest known -- on the northwest slope of Pine Mountain Ridge, about 0.8 mile south of the northeast-trending arm of Ken Lake. *Quercus parvula* var. *parvula*, on the one hand, seldom grows taller than 2.5 meters in some areas. On Mount Tamalpais, however, it seldom exceeds 10 meters, 4 to 7 meters being average.

*Quercus parvula* var. *tamalpaisensis* often has suckers growing at the base of older plants that are damaged or dying. I have seen sucker-shoots that are 3 meters tall. One such occurrence was in full light. The upper limbs of a number of plants at the latter location seem to be struggling to retain their leaves. At the base of these plants are healthy looking suckers with full foliage. These are protected from the direct sunlight.

Of all the native oaks in California, *Q. parvula* var. *tamalpaisensis* may be the most shade-tolerant. The healthier specimens are generally in partial shade to full shade. Plants in full sun are often noticeably defoliated. Even though both the mainland and the island versions of the other varieties of *Quercus parvula* are tolerant of shade, growing occasionally as understories, they need full light for best growth -- under which condition they normally retain their leaves. Larger trees of *Q. parvula* var. *shrevei* are usually found in full sun.

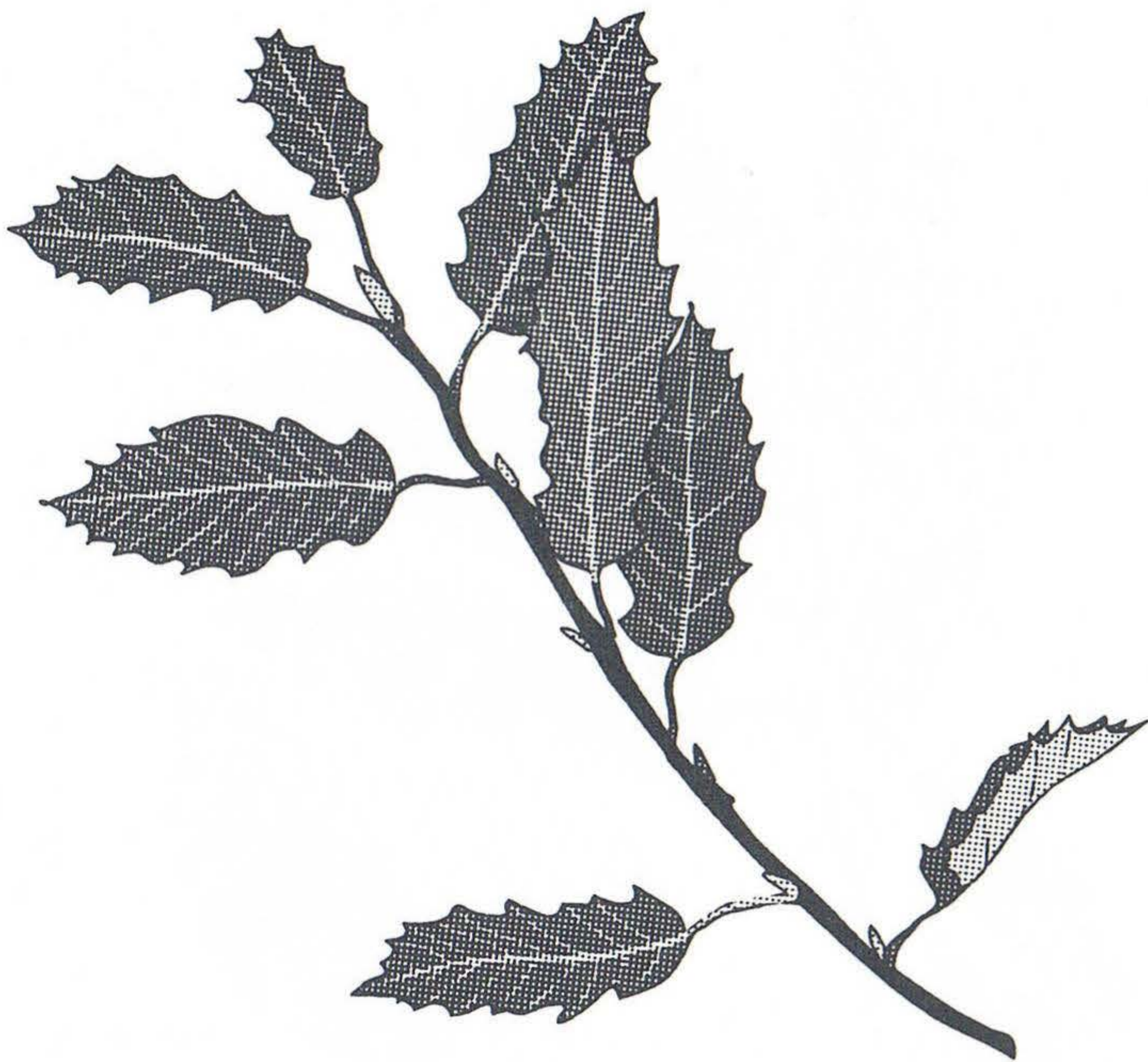
TABLE 1

A COMPARISON OF THE VARIETIES OF *QUERCUS PARVULA* GREENE

	<i>Q. p. parvula</i>	<i>Q. p. shrevei</i>	<i>Q. p. tamalpaisensis</i>
<b>Height</b>	Shrub to 2.5 m	Shrub, but mostly a tree to 20 m	Shrub to 6 m
<b>Foliage</b>	50 to 100 mm long, 25 to 40 mm wide, smooth margins; ovate to lanceolate with a pointed tip.	50 to 120 mm long, 20 to 50 mm wide. Smiliar to <i>Q. p. p.</i> Leaves on shrub form may have teeth on the margins	50 to 160 mm long, 20 to 60 mm wide; leaf margins with attenuate-dentate teeth
<b>Petioles</b>	2 to 15 mm long	2 to 25 mm long	5 to 15 mm long
<b>Winter buds</b>	Dark brown	Light to dark brown	Light to dark reddish-brown
<b>Twigs</b>	Glabrous; greenish-brown and fluted	Glabrous; greenish or brown	Similar to <i>Q. p. schrevei</i>
<b>Trunk</b>	Many	One to many	One to many
<b>Bark</b>	Gray, smooth to light furrowed	Gray to reddish-brown, smooth to ridged and furrowed	Gray to reddish-gray brown, occasionally ridged and furrowed
<b>Acorn shape</b>	Blunt tips; 18 to 35 mm long	Blunt tips, 20 to 40 mm long, 15 to 25 mm wide; barrel-shaped to semi-barrel-shaped	Semi-blunt tips, occasionally tapering; 15 to 35 mm long, 10 to 20 mm wide
<b>Acorn Color</b>	Reddish to semi-dark brown	Redwood to mixed evergreen	Light to dark reddish-brown
<b>Cups</b>	Dark brown, with accute silky-pubescent scales with silvery sheen; 20 mm deep	Deep brown with acute scales with silvery sheen; 22 mm deep, sometimes covering half the fruit	Light to dark reddish-brown; scales semi-acute with silvery sheen; 13 to 20 mm deep, covering up to 3/4 of the fruit
<b>Habitat</b>	Island chaparral to closed-cone-pine woodland	Redwood to mixed evergreen	Mixed evergreen, usually with Douglas-fir
<b>Sunlight Situation</b>	Shade to full sun	Shade to full sun. Best trees receive full light	Shade to full sun, but seems to be intolerant to the latter
<b>Elevation</b>	Near sea level	50 to 1100 m	100 to 750 m



*Quercus parvula* var. *sbrevei*



*Quercus parvula var. tamalpaisensis*

Perhaps in part because of its shaded habitat, the new oak seems not to produce large crops of acorns.

It is evident that this new oak is not merely a "shade form" of *Q. parvula var. shrevei*. I have observed many populations of var. *shrevei* from Monterey County to Marin County, but have found plants of the new variety only in the latter. Its distinctive leaf characters and possibly its production of basal shoots differentiate it from both var. *parvula* and var. *shrevei*, warranting recognition of it as a distinct variety.

So far, *Quercus parvula var. tamalpaisensis* has been found only in the Mount Tamalpais region even though more distant ridges probably could support it.

*Acknowledgments*

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