

Teloschistes Norman
(LECANORALES: TELOSCHISTACEAE)

After various authors

Rev. 5/94

Thallus fruticose or almost foliose, shrubby; lobes flattened, dorsiventral and sparingly branched to \pm rounded in section and \pm richly branched; upper surface \pm entirely bright yellow-orange to red-orange, sometimes paler or grayish below, or surfaces entirely gray-green to ash-green in some species; soralia sometimes present; isidia, maculae and pseudocyphellae absent; corticate on all surfaces; cortex of longitudinal, periclinal, agglutinate hyphae; usually without rhizines but often with marginal fibrils or cilia; attached to substrate by a basal sheath (rhizoidal hyphae according to Rogers). Medulla of \pm parallel, vertically aligned, loosely interwoven hyphae.

Apothecia terminal, marginal or laminal, sessile or stalked; disk round, concave to flat, yellow or orange; thalloid margin persistent, sometimes ciliate; disc yellow to orange; epihymenium granular, yellow, K+ crimson, containing algae (according to Rogers); hypothecium hyaline or pale; hymenium hyaline; paraphyses septate, \pm unbranched, apices \pm capitate; asci elongate-clavate, *Teloschistes*-type, of several layers but unitunicate, I+ blue; apically thickened with a broad internal beak, inner part of apex and external cap I+ blue; spores 8, oblong-ellipsoid, polaribilocular, or sometimes 3-septate, thick-walled, hyaline.

Pycnidia globose, round, deep orange-red, immersed, usually multilocular; conidiogenous cells parenchymatous; fulcrum endobasidial; pycnosporos bacilliform, straight, 2.5-3.5 x 0.5-0.8 μ m, simple, colorless. Thallus or at least discs with anthraquinones (parietin, teloschistin, emodin, fallcinal, parietinic acid, xanthorin, erythroglaucin). Salazinic acid reported from one species. Photobiont *Trebouxia*. On bark or rock, especially in warmer, subhumid and humid areas.

1. On gravelly and sandy soils in exposed places along old beach lines, arctic. *T. arcticus*

1. On bark or rock, southern. 2

2. Growing in crevices on calcareous rock, mostly in the Great Basin. *T. contortuplicatus*

2. Usually growing on bark or wood (only occasionally on rock), coastal. 3

3. Parietin (or other anthraquinone pigments) present only in the apothecia; thallus greenish, grayish, or brownish, K-. 4

3. Parietin present in thallus as well as apothecia; thallus usually distinctly orange and K+ purple on at least one side. 5

4. Thallus (especially upper side) rather densely covered with shaggy hairs (which may disappear in older thallus parts), ashy gray to brownish. Thallus without usnic acid. T. californicus Sipman

4. Thallus smooth or sorediose, sometimes with a few very short cilia or fibrillae, but not obviously hairy. Thallus containing usnic acid. [T. solediantha Riefner & Bowler ined.]

5. Thallus with wide, compressed branches, up to 3 mm across; often with ciliate tips and cilia on the apothecial margin. T. chrysophthalmus (L.) Th. Fr.

5. Thallus with slender, terete branches or but slightly compressed ones; without cilia. 6

6. Thallus 3-5 cm or more long, with few to mostly numerous sorediate patches; apothecia rare. T. flavicans (Swartz) Norman

6. Thallus 1.5-2.5 cm long, smooth, non sorediate; apothecia abundant. T. exilis (Michaux) Vainio

ADD:

T. sublychneus (?--not in Egan; I'm not sure where I got this name)

T. arcticus Zahlbr.

Thallus 1-2 cm tall, the branches flattened toward the base, cylindrical towards the tips; tips nodulose, with a few very short hyaline fibrillae; branching dichotomous to fastigiate-flattened; surface reddish orange; outer cortex discontinuous, of loose, irregular, \pm radiating leptodermatous hyphae 5-7 μ m diam.; inner cortex ca. 25 μ m thick, continuous, of \pm pachodermatous, vertical hyphae incrusting yellow with parietin; medulla of loose, anastomosing pachydermatous hyphae 5-7 μ m diam., the lumen 1-2 μ m, \pm radiate, and with the algae in scattered glomerules, the center \pm fistulose. Apothecia unknown.

T. californicus Sipman

Thallus (especially upper side) rather densely covered with shaggy hairs (which may disappear in older thallus parts), ashy gray to brownish. Thallus without usnic acid. Thallus fruticose, 1-2(-3) cm long, rather stiff, composed of one or more blades attached by a permanent basal holdfast, erect and spreading or pendulous, divided from the base into many mostly linear, compressed, channeled, much divided, undulate, \pm entangled branches; upper side flat or slightly convex, underside concolorous with upper side, but ecorticate, often venose or longitudinally striate-reticulate, sometimes hairy on the striae, towards the tip \pm covered with a thin, greenish layer of medium-sized soredia. Lobes 0.2-2 mm wide, at the tips often with minute dactyloid or coralloid-branched, ca. 0.1 mm wide, terete lacinulae. Hairs straight, ca. 1 mm long, at base c. 15 μ m wide, composed of bundled hyphae, mostly unbranched or with short perpendicular branchlets; lobe axils usually wide and rounded; wider lobes often perforated. Lobes ca. 100-200 μ m thick, composed of three very irregular layers; upper layer 10-25 μ m thick, prosoplectenchymatic, composed of \pm longitudinally running hyphae; algal layer ca. 75 μ m thick, much interrupted, with algae in scattered groups; ventral layer prosoplectenchymatous, composed of \pm longitudinally running hyphae, in depressions covered by scarce and thin patches of arachnoid tissue. Without soredia.

Apothecia infrequent, laminal on upper side of older parts of thallus, 0.5-1 mm across (to 2.5 mm according to ?), when young strongly constricted at base and with prominent margin and concave disc, later becoming flattened with wider base and less prominent margin; disc yellowish red or orange, the margin thin, concolorous with thallus, \pm hairy (ciliate?); hypothecium hyaline; hymenium 40 μ m tall, hyaline; epithecium yellowish granular, granules K+ dark reddish, dissolving and producing fine crystals; spores 8, polarbiolocular, oblong-ellipsoid, 11-15 x 4.5-6 μ m; septum occupying ca 1/3 of the length.

Pycnidia immersed in orange warts, ca. 0.1 mm diam., on upper surface of lobes; pycnosporangia ca. 3 x 1 μ m, elongate with rounded ends, slightly narrower towards one end.

On twigs of trees and shrubs, in coastal desert with abundant fog, southern California and Baja California.

T. chrysophthalmus (L.) Th. Fr.

Thallus with wide, compressed branches, up to 3 mm across; often with ciliate tips and cilia on the apothecial margin. Lobes \pm branched. Thallus golden yellow, orange-yellow, to pale orange (especially towards tips) or gray, foliose to fruticose, tufted, often forming loose cushions, (0.5-)1.5-2(-2.5) cm high, (0.5-)1-2(-4) cm diam., usually formed from single plants; branches at first stellate-radiate, 0.5 mm wide, becoming erect, branched, to 2.5(-4) mm wide, rigid, flattened, dorsiventral; upper surface plane to slightly convex, a matt to slightly shiny, smooth or weakly longitudinally ridged or wrinkled, not tomentose; mostly covered with numerous yellow (or grayish to dark), spinous marginal fibrils; lower surface lighter in color than the upper, grayish to white or rarely in part yellow, smooth, often wrinkled or longitudinally veined, sometimes with a few short rhizines. Quite variable.

Apothecia very common, mostly marginal or terminal on small laciniae, pedicellate, (1-)2-5(-7) mm wide; disk orange-red, darker than thallus (orange or orange-yellow according to ?), slightly concave to nearly plane, becoming convex with age; margin thin or somewhat thickened, slightly elevated, mostly covered with numerous (up to 150) orange-yellow, sometimes grayish or dark fibrils or spinules 0.5(-2?) mm long, rarely few or lacking; thalline margin yellow to grayish, smooth or slightly granular, sometimes with a few fibrils; asci clavate, partly somewhat ventricose, 45-55 x 15-18 μ m; spores bilocular, broadly ellipsoid, 10-16 x 6.5-8.5 μ m.

On oak in valley and foothill woodland and coastal scrub, from 500 to 2000 ft elevation, rare in California (slightly more common on the Channel Islands).

T. hypoleucus [T. hypoglaucus??] has a whitish, reticulate lower surface and quadrilocular spores.

T. contortuplicatus (Ach.) Clauz. & Rond.

Thalli to 0.5-1 cm high, often depressed, forming small, very irregularly shrubby, densely branched masses. Main stems leafy, flat to somewhat convex, ca. 1-2 mm wide, the underside \pm distinctly differentiated into strands, quickly and mostly very irregularly divided into fine branches, which are mostly densely crowded and to 0.2-0.5 mm wide; upper surface of all parts are densely impregnated with dust particles, giving a whitish appearance, but a few branches show a tinge of orange color. Branches end with groups of irregularly globose, isidia-like structures, which are irregularly beset with conical, again granular-incrusted "spines". Spermatogonia develop on the wider branches or also on the ends of the branches, under an orangish tissue; spermatia 2.5-3 x 0.7 μ m. In cold steppe areas, especially east of the Continental Divide and in southern Idaho; also in Nevada (etc.--see Rosentreter & McCune article).

T. exilis (Michaux) Vainio

Thallus 1.5-2.5 cm long, ca. 2-3 cm diam., suberect to somewhat loosely adpressed, loosely attached, dichotomously branched. Main branches entangled, 0.5-1 mm broad, terete to somewhat flattened, smooth, not pubescent, sometimes striate to subverrucose, non sorediate; orange-yellow or grayish (however, material from the Channel Islands is fairly reddish orange); lateral lobes not nodulose. Corticate on both sides (no distinct underside), finely spinulose at the tips, provided with numerous lateral fibrils which are 0.5-1 mm diam., yellow to orange-red, sometimes branched. Main branches occasionally abbreviated, thallus becoming somewhat pulvinate.

Apothecia frequent, laminal or marginal, sessile, 1-2 mm diam., when lateral sometimes provided with a small thalline branch like a spur. Disc plane to slightly convex, orange-red, darker than the thallus; margin thin, entire, without fibrils; thalline margin gray to yellowish, sometimes slightly granular. Asci oblong to subclavate, 52-75 x 14-20 μ m; spores bilocular, broadly ellipsoid, (10-)12-17 x 6-10 μ m.

Rare on mainland of California, but (if correctly identified) very common on the Channel Islands and Baja California.

T. flavicans (Swartz) Norman

Thallus 2-7(-10) cm long, with few to mostly numerous sorediate patches. Thallus pale yellow, yellow-orange to orange, or orange-red, suberect to adpressed and spreading, rarely pulvinate, loosely adnate to tufted, 2-4 cm broad, richly, \pm dichotomously, branched; nodes 1-5 mm apart; main branches rigid, entangled, 0.5-1 mm wide (< 0.5 mm according to ?), terete to somewhat flattened and broadened at the angles, sometimes slightly canaliculate, orange-red to gray, smooth or \pm pubescent (minutely tomentose), without fissures, sometimes striate, very rarely subverrucose, corticate on both sides (no distinct underside); secondary branches terete, especially towards the tips spinulate, with scattered yellowish to black-tipped fibrils 0.5-1 mm long, sometimes curved or branched; soralia orbicular to lengthened, yellow to whitish, rather diffuse; isidia absent; lateral lobes not nodulose. Polymorphic; a number of infraspecific taxa have been described (see Hillmann for key).

Apothecia rare, more common in tropical districts, laminal or marginal, sessile, 1-4(-6) mm diam. Disc plane to concave, old stages slightly convex, orange-red to dark brownish red, darker than thallus; margin entire to somewhat granular, sometimes scarcely fibrillose; thalline margin gray to yellowish, sometimes slightly granular. Asci oblong to clavate, 60-74 x 14-18 μ m. Spores bilocular, oblong to ellipsoid, 12-18(-20) x 7-12 μ m.

On conifers and other trees in coastal scrub near sea level, rare in southern California. Widespread in Mexico.

[T. sorediantha Riefner & Bowler ined.]

Thallus smooth or sorediose, sometimes with a few very short cilia or fibrillae, but not obviously hairy. Thallus containing usnic acid. Parietin (orange pigment) present only in the apothecia; thallus green-grayish, K-. Thallus fruticose, matlike, branching diffuse and irregular. Cortex rigid, clear to green-grayish, with the white medulla exposed through abrasions. Cortex not villous, though the plant resembles some morphologies of T. californicus. Large branches flattened and compressed, varying greatly and unevenly in width along a blade, with a gnarled, often lacunose appearance. Fine soredia present on the external cortex the length of the branches, arising from pseudocyphellae, abrasions or ruptures in the cortex or elliptic soralia; occasional netlike reticulations present in the blades. Apothecia subterminal; disc orange, flat or recurving, to ca. 2-4 mm diam.; spores oblong-ellipsoid, polarbilocular, 13-14 x 6 um. Pycnidia small, orange, occasional. On bark, Channel Islands of S. California.

ADD:

T. costatus f. macrosporus Hillm.
Mexico

T. hypoglaucus (Nyl.) Zahlbr.
Mexico: Puebla

T. nodulifera (Nyl.) Hillm.
Somewhat similar to T. exilis, but with lateral lobes digitately branched and nodulose. Baja California (identification needs checking).

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