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Orthotrichum spjutii (Orthotrichaceae) a new species from the northern Sierra of California

by

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With 1 figure

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Abstract: *Orthotrichum spjutii* is here described as new. It differs from other species of the genus by its glaucous coloration, strongly revolute leaf margins, costa covered by laminal cells in the upper half of the leaf, emergent oblong capsules, and peristome reduced to a few cells. This species belongs to the Section Rupestria, seemingly most closely related to *O. rupestre* and *O. pylaisii*.

Introduction

The genus *Orthotrichum,* with 35 North American species, is the second largest genus of true mosses on the continent. Sixteen of these species are endemic, with most of these endemics assigned to the Sections Diaphanum (5) and Rupestria (4) (Frahm & Vitt 1992). The relatively high number of endemic species suggests recent specialization to a number of distinctive, xerophytic habitats. The narrowly endemic species known from western North America include *O. bolanderi, O. praemorsum, O. holzingeri,* and *O. hallii.* Most of these species occur on xerophytic rock surfaces and tree trunks (Vitt 1973). We now report a high montane species known only from continuously misted rocks near a waterfall.

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Description

Orthotrichum spjutii n. sp.

Plantae usque ad 3.5 cm altae, glaucae. Folia ovato-lanceolata vel ovato-ligulata, marginibus revolutis; cellulae superioris papillatae; cellulae basilares elongato-rectangulatae. Flores gonoiautoici. Capsulae oblongae, emergentes, siccae leveter et parce sulcatae; peristominum simplex, obsoletum. Calyptrae pilosae. Sporae 8-11 μm.

Plants in compact tufts or cushions, to 3.5 cm high, sordid-green to olive-green, often with a glaucous cast. Stems erect to erect-ascending, occasionally branched from beneath perichaetia. Leaves erect-spreading to spreading when moist, loosely erect-appressed to erect-curved when dry, 2.0-4.0 mm long, about 2.5-3.5:1 length: width, broadly lanceolate, ovate-lanceolate, or ovate-ligulate, bluntly acute to obtuse, margins strongly revolute from just below apex to near base, papillose-crenulate; costa ending a few cells below the apex, abaxial surface covered with isodiametric laminal cells in distal half of leaf, in transverse section 4 cells thick, with 7-8 cells along abaxial perimeter; upper cells 10-15 μm wide, irregularly rounded to isodiametric, with obvious corner thickenings, strongly papillose, the papillae forked and densely arranged; medial cells to 16 μm wide, isodiametric to shortly rectangular, less strongly papillose; basal cells long-rectangular to elongate, pellucid, smooth, lateral walls somewhat irregularly thickened, shorter, narrower, and somewhat papillose along the margins. Marginal cells somewhat enlarged and extending along the stem as a narrow decurrency. Medial axillary hairs with one or two brown, basal cells, not offset from leaf insertion, to 8 cells and 250 μm long, with those laterally inserted much shorter than medial ones. Rhizoids very sparsely produced at base of plant, to 20 μm in diameter at insertion, smooth, red-brown, sparingly branched. Perichaetial leaves similar to vegetative ones. Perigonia large, conspicuous, in leaf axils or on short lateral branches. Goniautoicous. Setae 1.0-1.5 mm long, pale, erect, straight, gradually expanded to a long wrinkled neck. Capsules emergent, often-rather shortly so; urns 1.5-2.0 mm long, 1.5-2:1 length; width, oblong to shortly-cylindric, pale-brown to yellow-brown, erect, nearly smooth to lightly 8-ribbed, especially in distal 1/2, sometimes becoming deeply 8-ribbed and constricted with a flaring mouth when old and dry, exothecial cells at capsule mouth rounded, smaller than those lower medial exothecial cells which are to 25 μm wide, quadrate to irregularly rectangular, with rounded lumens and thick walls, lightly differentiated on ribs, stomates superficial, mainly in middle of urn. Opercula flat-conic, short-rostrate. Annuli of 1-2 rows of small cells. Peristome superficially absent, of more or less 16, very short, blunt, papillose teeth 1-3 cells high. Calyptrae ovoid-campanulate, mitrate, plicate, hairy, the hairs with spiculose papillae throughout. Spores 8-11 μm, finely papillose. Fig. 1.

Holotype: U.S.A. California: Tuolumne Co., on moist, diffusely lit outcrop in spray of waterfall at outlet of valley of Koenig Lake, east slope of the Sierra Nevada, east of Sonora Pass along Hwy 108, Toiyabe National Forest, elev.: ca. 2600 m, Janatova & Norris 76536 (ALTA); Isotypes (Norris, NY, MO); Paratype: U.S.A. California: Tuolomne Co., on very moist, diffusely lit rocks in spray of falls in glacial cirque and outlet valley with scattered *Pinus albicaulis* at Koenig Lake near

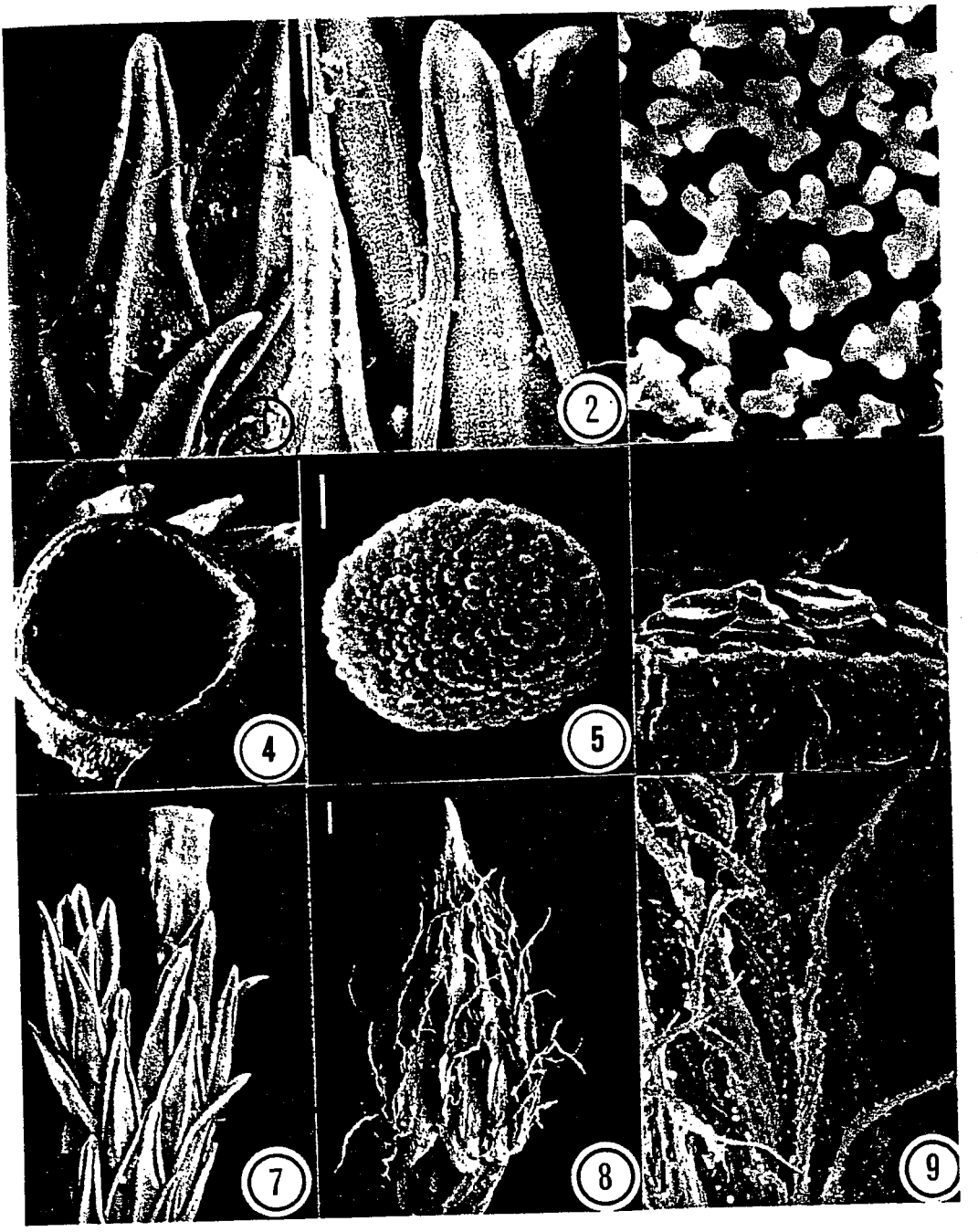

Fig. 1. *Orthotrichum spjutii* n. sp.. 1. Leaf set. 2. Revolte leaf margins. 3. Papillose upper leaf cells. 4. Urn mouth. 5. Spore. 6. Peristome. 7. Plant. 8. Calyptra. 9. Papillose calyptra hairs. [Scale bars: 1, 2, 4, 7, 8 = 200 μm; 3,5 = 2 μm; 6 = 10 μm; 9 = 40 μm.]

Leavitt Lake on east slopes of Sierra Nevada east of Sonora Pass along Hwy. 108, elev. 2600 m, Norris 57207 (Norris).

Named after Richard Spjut who suggested the visit to Koenig LAke and accompanied Norris at the time of the first collection.

Discussion

Orthotrichum spjutii belongs in the Section Rupestria, and is most closely related to *Orthotrichum rupestre* and *O. pylaisii*. It shares with these two species and others of the Section Rupestria rather large, coarse plants, superficial stomates, and nodose, elongate basal leaf cells. Distinctive features of *O. spjutii* include the following: 1) glaucous coloration owing to large multifid upper leaf cell papillae, 2) strongly revolute leaf margins, 3) enlarged, hyaline cells at the leaf insertions, 4) emergent, oblong capsules, 5) peristome reduced to 1-2 cells and seemingly absent, and 6) small spores. The leaf cells are much more strongly papillose than in most other species, and resemble those found in *O. alpestre,* another species with glaucous coloration. The leaf margins are as strongly revolute as those in *O. rivulare,* a species also found on seasonally to perennially wet rock surfaces. Enlarged cells at the leaf insertion are rarely found in the genus and, in North America, such a feature is present only in *O. holzingeri*. The capsules resemble those in *O. rupestre,* where they vary from immersed to emergent and smooth to moderately 8-ribbed however, in *O. spjutii,* the capsules are generally shortly emergent. *Orthotrichum rupestre* always has 16 well-developed exostome teeth. These may be broken off when old, and superficially resemble the situation in *O. spjutii* where the peristome is never developed past the existence of low teeth 1-3 cells high. The small spores (8-11 μm of *O. spjutii* are distinct from all other species of the Section Rupestria, a group with spores rarely smaller than 13 μm.

Literature cited

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