THE RANGE OF THE LICHEN PARMELIA EURYSACA

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The North American lichen Parmelia eurysaca Hue has a much more extensive range than was previously suspected. Although it has been believed to be restricted to Mexico and adjacent Texas and Arizona (Hale, 1965), it actually ranges widely through the East to the mid-Atlantic states and north to Iowa (Fig. 1).

Parmelia eurysaca has almost consistently been mistaken for P. perforata (Jacq.) Ach. In recent research on the P. perforata complex (Culberson and Culberson, 1973; W. L. Culberson, 1973), the 1,096 appropriate specimens in the herbaria of the Smithsonian Institution and of Duke University were analyzed for morphology and natural-product chemistry. As a result 80 specimens of P. eurysaca were recognized.

Parmelia eurysaca is a locally abundant epiphyte of nonconiferous trees in Mexico, from whence it was originally described (Nouv. Arch. Mus. Hist. Nat., Sér. 4, 1: 194. 1899). In the eastern United States the species is very rare, but it remains ecologically similar, an epiphyte of hardwoods. The species is conspicuous in having large marginally ciliate lobes lacking both soredia and isidia. Parmelia eurysaca resembles P. perforata in general habit and in producing large perforate apothecia (79% of the specimens examined were fertile), conspicuous pycnidia, and often a striking white or mottled zone in the naked margin of the lower cortex. It differs from the esorediate members of the P. perforata group (P. perforata, P. preperforata W. Culb., and P. rigida Lynge) in the production by most specimens of few to many narrow laciniae and in the secondary natural-product chemistry of the medulla. (Thallus chemistry of all specimens was assayed by thin-layer chromatography [C. F. Culberson, 1972].) Parmelia eurysaca
Fig. 1. The range of *Parmelia euryaca*.

consistently produces the β-orcinol depsidone salazinic acid. By contrast *P. perforata* consistently produces the β-orcinol depsidone norstictic acid and connorstictic acid, the latter a substance of unknown structure (but almost surely also a β-orcinol depsidone). *Parmelia preperforata* produces the β-orcinol depsidones stictic acid and constictic acid, and *P. rigida* produces the orcinol depsidone alectoronic acid. Consequently all specimens (including juveniles) of these morphologically similar species can be identified definitively by thallus chemistry.

When the monograph of *Parmelia* subgenus *Amphigymnia* was published (Hale, 1965), *P. euryaca* was known from a much smaller number of specimens, collections that also came from less than half the now known range. The many newly identified specimens show that the species has a considerably broader range of morphological variation than had been obvious earlier. The extensive intergradation of lacinial size and abundance, of maculation, and of the white mottling
of the lower cortex convince us that *P. permaculata* Hale, originally described from Mexico (Vera Cruz) and Alabama (Hale, 1971), is only an extreme in a continuum. *Parmelia permaculata* should consequently be considered a synonym of *P. euryssaca*.

Although *P. euryssaca* resembles the esorediate members of the *P. perforata* group, its ability to form abundant laciniae—a tendency especially pronounced in Mexican populations—indicates a more distant relationship. In fact it seems that in the large subgenus *Amphigymnia*, *P. euryssaca* has no very close relatives nor has it given rise to asexual esorediate morphs comparable to those seen in the *P. perforata* group. This lichen is one of the most widely distributed species indigenous to North America and one of the rarest foliose species in the eastern United States.

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**LITERATURE CITED**


**TAXONOMY OF PYTHIUM SYLVATICUM AND RELATED FUNGI**

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For the most part, *Pythium* spp. are known to mycologists only after they have been isolated from soil, roots, or water, and grown on media