

broadly lanceolate, while those of *C. album*, L. are rhomboid. Both species drop the larger leaves early, many of them even before blooming. It is to this fact that I attribute the cause of our authorities regarding them as one species; when the leaves have fallen, so that but few of the smaller ones are left among the flowers, they are not so readily distinguished.

- (e) These distinctions are constant, the two forms do not show a disposition to shade into one another. Among thousands of plants observed during the last ten summers, there never has been any doubt as to which species a given specimen belonged.
- (f) *C. viride*, L., is a hardier plant, and a later immigrant into the Wabash valley; while it is annually increasing in abundance, its congener is gradually becoming less common.
- (g) In regard to the mealiness, I have observed little constant distinction; probably *C. album*, L. is more mealy, especially among the flowers. The flowers are also a little larger in this species.—DR. J. SCHNECK.

New Species of Fungi, by Chas. H. Peck.—*PUCCINIA MIRABILISSIMA*.—Spots small and dot-like or larger and subrotund, black or blackish-brown above; sori hypophyllous, few, small, pale reddish-brown; *stylospores* subglobose obovate or pyriform, obtuse, very minutely rough, .0009–.0013 of an inch long, .0008–.0009 of an inch broad, pedicel colorless, easily separating from the spore when mature; *teleutospores* intermingled in the same sorus with the *stylospores*, elliptical, obtuse, constricted at the septum, minutely rough, .0012–.0013 of an inch long, .0009–.001 of an inch broad, pedicel very long, colorless.

Living or languishing leaves of *Berberis repens*. City Creek Canon, Utah, July, M. E. Jones.

In this singular *Puccinia* both kinds of spores are intermingled in the same sorus, but the *Uredo* or *stylospores* are much more numerous than the others. They appear to be joined to their pedicels by an articulation, and when mature they easily separate from these like *Trichobasis* spores, although in general appearance they closely resemble the spores of many species of *Uromyces*. The pedicels of the *Puccinia* or *teleutospores* are usually two or three times as long as the spores. There are from one to six sori on a spot.

PUCCINIA JONESII.—Spots pallid, indefinite; *hymeniferous fungus* with peridia short, crowded, wide-mouthed, crenulate on the margin, the spores subglobose, orange yellow, .0008–.001 of an inch broad, *teleutosporous fungus* with sori mostly hypophyllous, rarely a few epiphyllous, scattered, at first covered by the epidermis, at length exposed, subpulverulent, black, the spores elliptical or oblong-elliptical, obtuse, substriate, minutely rough, scarcely constricted at the septum, .0012–.0016 of an inch long, .0008–.0009 of an inch broad, the pedicel very short.

Living leaves of *Ferula multifida* and *Peucedanum simplex*. Utah, May and June.

This species is respectfully dedicated to its discoverer, Prof. M. E. Jones. He remarks concerning the form on *Ferula multifida*, that the *Puccinia* always attacks the plant later than the *Æcidium* and that the fungus soon kills the leaf. I find no good characters by which to separate the form on *Peucedanum simplex* from the one on *Ferula multifida*. In both cases the *Æcidium* and the *Puccinia* occur on the same plant and even on the same leaf. I have therefore united the two as conditions of one species.

Puccinia Arnicalis.—Spots pallid or none; sori amphigenous, clustered, crowded or confluent, reddish-brown; *stylospores* subglobose, minutely rough, .0008–.0012 of an inch broad, reddish-brown, containing one or two nuclei; *teleutospores* intermingled with the *stylospores*, obovate or elliptical, obtuse, scarcely constricted, minutely rough, .0012–.0018 of an inch long, .0008–.00095 of an inch broad, concolorous, the pedicel very short, colorless.

Living leaves of *Arnica cordifolia*. Colorado. T. S. Brandegee. Communicated by E. S. Rau.

The fungus was found on plants growing at an altitude of 10,000 feet. The *Puccinia* spores are intermingled in the same sorus with the *Uredo* spores and are of the same color with them. The latter have no pedicels when mature. The sori occur chiefly on or near the midrib.

Puccinia Troximontis.—Spots pale or obsolete; sori amphigenous, scattered, reddish-brown or blackish-brown; *stylospores* subglobose, minutely rough, .0008–.0012 of an inch broad, reddish brown; *teleutospores* subelliptical, obtuse, scarcely constricted, minutely rough, .0011–.0014 of an inch long, .0008–.0009 of an inch broad, blackish-brown, the pedicel short and colorless.

Living leaves of *Troximon cuspidatum*. Utah. May. Jones.

This species is closely related to the preceding one, but differs from it in its scattered sori and in having the *teleutospores* in distinct and darker colored sori.

Puccinia Acrophila.—Spots brown, sometimes tinged with purple; sori scattered or crowded, reddish-brown; spores obovate or elliptical, obtuse, constricted at the septum, rough or verruculose, .0011–.0013 of an inch long, .0008 of an inch broad, the pedicel short and colorless.

Living stems and leaves of *Synthyris pinnatifida* Utah. Jones.

The fungus was found on plants growing at an altitude of 12,000 feet. The sori most frequently occur at or near the tips of the leaf segments, which suggests the specific name.

Puccinia Mertensiae.—Spots none; sori amphigenous, reddish-brown, scattered or in clusters; spores elliptical, slightly constricted at the septum, obtuse, rough or verruculose, .0011–.0014 of an inch long, .0008–.0009 of an inch broad, the pedicel short and colorless.

Living leaves of *Mertensia Sibirica*, Colorado. Brandegee, Utah, July, Jones.

The fungus occurs on plants growing at an altitude of 11,000 feet. It is closely related to the preceding species and possibly future ob-

servations may justify their union. The spores in the present species are a little broader and more distinctly warted or roughened than in the preceeding one.

PUCCINIA PLUMBARIA.—Spots brown and indefinite, sometimes none; sori mostly hypophyllous, sometimes amphigenous, orbicular oblong or irregular, scattered or crowded, sometimes confluent, prominent, at first covered by the epidermis and then of a peculiar lead-color, blackish when exposed; spores obovate or elliptical, obtuse, slightly constricted at the septum, minutely rough, .0012-.0016 of an inch long, .0008-.001 of an inch broad, the pedicel very short, colorless.

Living leaves and stems of *Collomia gracilis* and *Phlox longifolia*. June and August. Utah. Jones.

The form on Phlox has the sori more scattered and on both sides of the leaf, otherwise I find no satisfactory mark of distinction, and believing the two to be forms of one species I have united them. The dark sori, while covered by the thin epidermis, have a peculiar leaden tint which suggests the specific name.

PUCCINIA CALOCHORTI.—Spots blackish or none; *hymeniferous fungus* with the peridia crowded, short, clustered, the spores subglobose or angular, yellow or orange, about .0008 of an inch broad; *teleutosporous fungus* with sori scattered or crowded, oval or oblong, black, the spores subelliptical, obtuse, slightly constricted at the septum, rough, .0014-.0016 of an inch long, about .001 of an inch broad, the pedicel short.

Living leaves of *Calochortus Nuttallii*. Utah. June. Jones.

The species is related to *P. Lojkiana*, but our fungus has the spores smaller, more obtuse and not so coarsely warted. Both the *Æcidium* and the *Puccinia* occur on the same leaf.

Isoetes lacustris.—The following note is so interesting that we reproduce it from *Nature* (April 7) and would ask our collectors to make note of any similar behavior on the part of this species in our own country:

In a paper read before the Academy of Sciences of Paris (Jan. 10, 1881.) M. E. Mer calls attention to the peculiar conditions under which different forms of this fresh-water plant seem to originate in the Lake of Longemer. The basin of this lake was once occupied by a glacier, and now presents several different sorts of bottom. The soil to a depth of two to three metres is composed in part of a gravel formed of rock *debris* united by an iron cement, in part of ancient moraines, or where near the surface these will be mixed with the remains of plants and form a pretty tenacious mud. In all these situations *Isoetes* is to be found, but the plants differ most remarkably both as to their form, their structure, and their mode of reproduction as they are found in the different habitats. Taking the leaf development as a guide, four varieties are easily discerned:—(1) *humilis*, growing sparsely in the gravel and sterile shallows, the leaves are not only few in number, but always of diminutive dimensions; sporangia generally wanting or represented by a small cellular mass which rarely ever

forms a propagule, and then these with puny leaves; (2) *stricta*, found on the borders of the lake or in the old alluvial, therefore in less sterile quarters than the preceding; leaves more numerous, stout, but still of small size; (3) *intermedia*, growing on ground formed of a mixture of mud and clay, either on the borders of the lake or at a depth of from one to two metres; leaves quite intermediate in character between the previous variety and the next; (4) *elatior*, growing on the clayey depths, with long leaves. The first form is always found isolated, and as to its asexual reproduction there is nothing more to be said; but the other three, according as they are subject to more or less heat, present each three varieties characterized by the mode of reproduction. 1. *Sporifera*, isolated individuals, mostly furnished with well-developed sporangia, stem large, roots numerous, leaves large. 2. *Gemmifera*, few fertile sporangia, but most of the leaves are furnished with propagula, and these well furnished with leaves, generally dextral, stem fairly developed. 3. *Sterilis*, individuals growing in compact masses, stems and roots slender, leaves not numerous, long and narrow, fertile sporangia very rare, and more often undeveloped masses of cells or abortive propagula. It would seem as if these facts had a practical interest to the collector, who may find in them a guide as to where to look for fertile specimens.

Bebb's Herbarium Salicum.—We are in receipt of the first fasciculus of Mr. M. S. Bebb's *Herb. Salicum*. Any one who has ever seen Mr. Bebb's specimens knows just how perfect and complete this bundle is. In his work towards a monograph of North American Willows, Mr. Bebb has shown rare judgment and still rarer patience. How else could he have undertaken to let a little light through that dark maze of forms which meets the eye of every botanist who has dared to look at willows? Nowhere do lines between species run so indistinctly, in fact it can hardly be said that there are such lines. Now Mr. Bebb proposes to help us just where we so much need help, and every botanist should make it a point to contribute notes and specimens that this monograph may be as exhaustive as possible. Accompanying the very complete specimens of this fasciculus are full descriptions and very many drawings of leaves and capsules, the latter enlarged to a uniform scale of twelve diameters.

We can note but a few of the many things that catch a botanist's eye in looking through the bundle. One of the most satisfactory results is the settling of Muhlenberg's *S. myricoides*. Botanists have been inclined to give it specific rank, or to make it a variety of *S. cordata*, but Mr. Bebb shows conclusively that it is a hybrid from *S. cordata* and *S. sericea*.

Another very interesting hybrid is that from *S. petiolaris* and *S. candida*, species so dissimilar that a cross was hardly to be expected. In case it should become the custom to give distinct names to such hybrids, Mr. Bebb desires to call this beautiful willow *S. Clarkei*.

A new species is proposed under the name *S. glaucophylla* and there seems to be no reason why it should not stand. Mr. Bebb has



1881. "New Species of Fungi." *Botanical gazette* 6(6), 226–229.
<https://doi.org/10.1086/325482>.

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DOI: <https://doi.org/10.1086/325482>

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