

BULLETIN
OF THE
TORREY BOTANICAL CLUB

JULY, 1922

New species of Uredineae—XIV*

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In the tenth article in this series of new species an error was made in the determination of the host for *Uromyces fuscatus* (Bull. Torrey Club 45: 142. 1918), which should be *Rumex paucifolius* Nutt., and not "*Polygonum alpinum* All." as printed. It was due to the persistent efforts of Mr. A. O. Garrett, who first thought the host of the collection which he made was *Pentstemon* (see Fungi Utahenses 244), that the facts in the case were finally established. In July, 1920, Mr. Garrett visited the Utah locality at Gogorza, where he first collected the rust in June, 1915, and secured a flowering stalk of the host, showing it to be *Rumex paucifolius*. Upon my presenting the situation to Professor Aven Nelson, he looked up the field notes and the herbarium specimens collected in Idaho at the same place and time as the type of *U. fuscatus* and came to the conclusion that the host of this collection also was *R. paucifolius*. Only these two localities for the species are known up to the present time.

The correction of these errors was complicated by a similar uncertainty and error in the host names for *Puccinia Polygoni-alpini* Cruch. & Mayor (*Dicaeoma Polygoni-alpini* Arth. N. Am. Flora 7: 385. 1920), for which only two collections were known at that time, a third one having been added from Greenville, California, since the printing of the Flora. *Rumex paucifolius*, host of the *Uromyces*, can not be told from *Polygonum alpinum*, host of the *Puccinia*, when the fruiting parts are absent, hence the difficulties that have arisen.

* Contribution from the Botanical Department of Purdue University Agricultural Experiment Station.

[The BULLETIN for June (49: 163-188. pl. 9) was issued July 8, 1922]

In the twelfth article of this series, under *Puccinia offuscata* (Bull. Torrey Club 47: 469. 1920), the name *Uredo Zorniae* Dietel (Hedwigia 38: 257. 1899) should have been given as a synonym. This name was applied to Ule's 2296 from Brazil. Although pycnia have not been seen yet there is circumstantial evidence to indicate that no aecia are produced, and therefore the species is probably a *Bullaria*, and should be called *B. Zorniae* (Dietel) comb. nov. It is a species of the New World, to which the name *Puccinia Zorniae* McAlpine does not apply.

In the same article, under *Pucciniastrum americanum* (Bull. Torrey Club 47: 468. 1920), *Rubus occidentalis* was erroneously given as a host for this species. The error was called to my attention by Dr. J. J. Davis of the University of Wisconsin, and was confirmed by subsequent examination under the microscope. The type of *P. arcticum americanum* Farl. is on *Rubus neglectus* Peck, collected at Bussey, near Cambridge, Massachusetts. This collection is first mentioned in the original article by Farlow (Rhodora 10: 16. 1908) as on *R. occidentalis* near Cambridge, but later in the article is referred to as on *R. neglectus*, Bussey, October, 1875. The correction in the name of the host is credited to M. L. Fernald. I have been able to ascertain these facts through the assistance of Dr. R. Thaxter, who has carefully examined the original material in the Farlow Herbarium.

Melampsoropsis roanensis sp. nov.

II. Uredinia hypophyllous, in crowded groups of 2-8 on somewhat discolored spots, roundish or ovoid, 0.3-0.8 mm. long, prominent, early dehiscent by a central or lateral slit, leaving a border or a cap-like covering of epidermis, pulverulent; peridium delicate, uniform in thickness; urediniospores catenulate, ellipsoid, 20-26 by 32-40 μ ; wall colorless, 1.5-2.5 μ thick, closely and finely verrucose on one side grading to coarsely verrucose on opposite side with somewhat deciduous cylindric tubercles, 2 μ long.

Telia hypophyllous, in irregular and often confluent groups on reddish spots, roundish or ovoid, 0.5-1 mm. across, elevated, prominent, waxy, orange-red, tardily naked; teliospores cuboid, 16-20 μ broad, almost or quite as long, in a series 65-100 μ long; wall colorless, thin, 1 μ , smooth; contents orange-red.

On *Rhododendron catawbiense* Michx. (Ericaceae), summit of Roan Mountain, Carter County, Tennessee, altitude 6400 feet, July, 1887, II, R. Thaxter.

On *Rhododendron punctatum* Andr., LeConte Mountain, Sevier County, Tennessee, altitude 6600 feet, June 8, 1921,

ii, III, *H. F. Bain*, communicated by John A. Stevenson 5812 (type).

The urediniospores of this interesting species are much larger and more prominently verrucose than those of the common form in Europe, *M. (Chrysomyxa) Rhododendri*. This is the first rust on *Rhododendron* seen from the eastern United States, although the European species has been ascribed to this country by a number of authors. Duggar says (*Fungous Diseases* 432. 1909), "In the United States this fungus is particularly common in the mountains of the east, and southward as far as the southern limits of the Appalachians." The statement does not apply to any true rust on *Rhododendron*. Roan Mountain and LeConte Mountain are about 100 miles apart. The rust was reported abundant on the summit of LeConte Mountain. Mycologists who visit the summits of these mountains and those nearby should be on the lookout for the aecia, which may be expected to occur on species of *Picea*.

***Cronartium stalactiforme* Arthur & Kern, comb. nov.**

Peridermium stalactiforme Arth. & Kern, Bull. Torrey Club 33: 419. 1906.

This *Cronartium* belongs to a group of three species which have been much confused, both in nomenclature and in structural characters. All three species have uredinia and telia on *Castilleja* and related genera of scrophulariaceous hosts, which are difficult to distinguish except by means of cultures. The aecia of the three species, however, occurring on pine trunks and branches, can be identified with considerable certainty, even by their gross appearance. The aecia of *C. stalactiforme* are confined to the bark and do not produce woody galls. They often extend over considerable areas, and cause little or no swelling. The individual aecia are low and flattened, with a circumscissile dehiscence.

Cronartium filamentosum (Peck) Hedgc. (*Peridermium filamentosum* Peck, 1882) is similar to *C. stalactiforme* in the effect upon the host, but the individual aecia are more elongated, often becoming cylindric, and have noticeable filaments extending from top to bottom through the individual aecia. There are only rudiments of such filaments in *C. stalactiforme*.

Cronartium coleosporioides (Diet. & Holw.) Arth. (*Peridermium Harknessii* Moore, 1876) differs from the two preceding species by producing a woody gall, often of considerable size and

abruptly rising from the healthy tissue. The individual aecia are low and coalesce into a more or less continuous mass, and are entirely without internal filaments.

There has been much confusion regarding the application of the name *Peridermium Harknessii*, owing in the first place to the obscure way in which it was first published*, and in the second place to the later inclusion of the Pacific Coast forms of the very similar *P. Cerebrum*, whose uredinia and telia occur on leaves of oak.

The name was announced at a meeting of the San Francisco Microscopical Society in July, 1876, by J. P. Moore, who exhibited specimens and explained the nature of the fungus, and who read a letter from H. W. Harkness describing the species in an informal but accurate manner. The collection to which the name was applied was made by Harkness and Moore on May 26, 1876, at Colfax, California, which is in Placer county,

* Our attention was directed to the early history of this name by Mr. E. Bethel in a letter dated January 22, 1922. Through the assistance of Mr. W. M. Hepburn, of the Purdue University Library, and Professor W. C. Blasdale, of the University of California, the following facts have been established.

In the minute book of the San Francisco Microscopical Society this record occurs: "July 20, 1876. Mr. J. P. Moore read a paper written by Dr. H. W. Harkness on a new variety of fungus infesting *Pinus ponderosa* near Colfax, and he proposed the name *Peridermium Harknessii*, which was adopted." There is also in the archives of the society a newspaper clipping giving a more extended account of the matter as presented to the society. This clipping, Professor Blasdale has ascertained, came from the issue of the *Daily Alta California* of San Francisco, of Saturday, July 22, 1876, volume 28. It consists of the Harkness paper in full, and a paragraph stating how Moore proposed the name.

The society did not issue any printed account of its proceedings during this period of its existence, but occasionally, as the subject matter warranted, the secretary transmitted a more or less formal minute to the *London Monthly Microscopical Journal*. In the issue of that journal for September 1, 1876, an account of the meeting of July 20 is given in the same words used in the newspaper clipping, with three additional paragraphs.

What is referred to as a paper by Dr. Harkness is in the form of a letter to the secretary of the society. It begins with the sentence: "I have today forwarded for the Society's Cabinet a specimen of *Peridermium*," etc. This type material was destroyed in the great San Francisco fire, being bulky and in a box separate from other type collections, as Mr. Bethel writes, who has consulted the herbarium of the society both before and since the fire, and as stated by Meinecke (*Phytopathology* 10: 281. 1920), who also calls attention to the duplicate specimen at the New York Botanical Garden.

about fifty miles west of Lake Tahoe. Harkness says the fungus "appears both on the limbs and trunks of young trees of the variety *Pinus ponderosa*, generally forming a complete circle around the trees, its sporidia appearing as a zone of bright orange yellow. The spores first germinate beneath the cuticle, which it destroys. Owing to the irritation of this presence an abnormal thickening of the cambium is produced, which in turn gives place to an excessive growth of woody fibre. This process being repeated from time to time a large bulbous expansion is soon formed, so that as often occurs a stem of but an inch in diameter is enlarged to that of four or five. Above this bulb the further development of the stem is retarded, or arrested altogether, its place being supplied by a dense tuft of minute branches." Among other matters it is also stated that "in the vicinity of Colfax the fungus appears to be limited to an area of but a few acres in extent. Within that area, however, it is destroying the young growth."

The quotation is taken from the report by the secretary of the San Francisco society sent to the Monthly Microscopical Journal of London, and printed on page 164 in volume 16, bearing the date of September 1, 1876. This periodical was maintained by the Royal Microscopical Society.

The name, host and locality are cited in Harkness & Moore's Pacific Coast Fungi in 1880, still without confusion with any other form. But when Harkness published technical descriptions of "New species of Californian fungi" in the Bulletin of the California Academy of Science in 1884, other forms and hosts were incorporated, and from this time on the application of the name has been various.

The chief source of confusion has been in failing to recognize the Pacific Coast form of *Peridermium Cerebrum* Peck, which occurs along the coast of California, and is especially abundant at Monterey on *Pinus radiata* (*P. insignis*). The present writers feel especially culpable for this confusion, for they placed *P. Harknessii* under *P. Cerebrum* as a synonym in their paper on North American species of *Peridermium* on pine (Mycologia 6: 133. 1914), and have been followed by Meinecke, in his paper on *Peridermium Harknessii* and *Cronartium Quercuum* (Phytopathology 6: 225-240. 1916), and by others.

The present knowledge of the *Castilleja* rusts indicates that the correct application of the names should be as follows:

Cronartium filamentosum (Peck) Hedgc. (*Peridermium filamentosum* Peck, 1882);

Cronartium coleosporioides (Diet. & Holw.) Arth. (*Uredo coleosporioides* Diet. & Holw. 1893);

Cronartium stalactiforme Arth. & Kern (*Peridermium stalactiforme* Arth. & Kern, 1906).

Should it be deemed advisable to combine these three species as subspecies, races, or forms, the name to be employed for the aggregate species, using the oldest specific name, would be *Cronartium Harknessii* (Moore) Meinecke, *Phytopathology* 10: 282. 1920.

DIABOLE gen. nov.

Cycle of development includes only subcuticular telia, with a possibility of pycnia.

Telia somewhat indefinite in extent, without paraphyses. Teliospores free, usually paired on a common pedicel, one-celled, more or less adhering laterally; wall colored, usually verrucose, at least above; pore one, in upper part of cell.

Diabole cubensis comb. nov.

Uromycladium (?) *cubense* Arth. *Mem. Torrey Club* 17: 119. 1918.

The species occurs in Cuba on *Mimosa pigra* L. (*M. asperata* L.) and was at first assigned with many misgivings to the genus *Uromycladium*. That connection has become more and more uncertain, and it is now believed to constitute a new and very distinctive genus.

Puccinia Plucheae (Sydow) comb. nov.

Uredo Plucheae Sydow, *Ann. Myc.* 1: 333. 1903.

Uredo biocellata Arth. *Bull. Torrey Club* 33: 517. 1906.

Puccinia biocellata Vestergr. *Micr. Rar. Sel.* 1267. 1908.

The teliospores of this rust have been collected on two hosts, *Pluchea fastigiata* Griseb. and *P. Quitoc* DC., in Argentina, and issued in Vestergrén's exsiccati, Nos. 1267 and 1368. The rust occurs on a number of species of *Pluchea* in Florida, Guatemala and the West Indies, but no teliospores have yet been found in North America.

Uredo nominata sp. nov.

II. Uredinia amphigenous, grouped upon discolored areas, 5-10 mm. across, oblong or linear, 0.4-5 mm. long, somewhat

tardily naked, pulverulent, light-brown, ruptured epidermis evident; urediniospores ellipsoid or obovoid, 18-23 by 23-32 μ ; wall light cinnamon-brown, 1.5-2 μ thick, moderately echinulate, the pores 3 or 4, approximately equatorial.

On *Sisyrinchium Bermudianum* L. (*Iridaceae*), St. Davids, Bermuda, February 26—March 9, 1908, *Stewardson Brown 611*. A number of rusts have been described on *Sisyrinchium*, both from North and South America, but representatives of them are rare and scanty in herbaria. Judging from descriptions and the small amount of material available this form should be considered distinct.

***Uredo cumula* sp. nov.**

II. Uredinia amphigenous, somewhat aggregate or scattered, round, applanate, small, 0.1-0.4 mm. across, soon naked, pulverulent, cinnamon-brown, conspicuous, ruptured epidermis noticeable; urediniospores broadly ellipsoid or obovate, small, 18-20 by 22-25 μ ; wall pale cinnamon-brown, thin, 1 μ or less, finely echinulate, the pores 2, equatorial, indistinct.

On *Buchnera elongata* Sw. (*Scrophulariaceae*), Herradura, Cuba, March 24, 1921, *John R. Johnston 2530*. The species is notable for its small delicate spores, although when massed on the surface of the plant they are of ordinary conspicuousness. The generic name of the host is sometimes written *Buechnera*.

***Uredo curvata* sp. nov.**

II. Uredinia hypophyllous, loosely grouped on slightly discolored areas 3-5 mm. across, round, small, 0.1-0.3 mm. in diameter, soon naked, pulverulent, dark chestnut-brown, ruptured epidermis inconspicuous; paraphyses numerous, peripheral, incurved, hyphoid or somewhat clavate, slender, about 7 by 30 μ , the wall thin, less than 1 μ , slightly thicker above, 1-2 μ , colorless below, light chestnut-brown above, sometimes one- or two-septate; urediniospores obovate, 14-16 by 26-32 μ , very strongly curved; wall chestnut-brown, uniformly thin, 1 μ , with one indistinct pore on the concave side below the equator, evenly echinulate-verrucose.

On *Inga vera* Willd. (*Mimosaceae*), San Diego de los Baños, Cuba, March 26, 1921, *John R. Johnston 2540*. The species is remarkable for its very much curved spores with one pore on the indented side, being in this respect similar to the uredinia of *Puccinia invaginata* Arth., which occurs in Cuba on the rhamnaceous genus *Gouania*.

***Aecidium Yuccae* sp. nov.**

O. Pycnia amphigenous, in small and crowded groups, inconspicuous, honey-yellow, subepidermal, small, globoid,



Arthur, Joseph Charles. 1922. "New species of Uredineae. XIV." *Bulletin of the Torrey Botanical Club* 49, 189–196.

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