Folia suppetentia maxima 140 mm. longa, 35 mm. lata.


Ad Taipe Formosae borealis cultum. (T. Makino anno 1896).


Ad Pachilan prope Taipe. (T. Makino.) Specimina sterilia.


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**Notes on Some Melampsorœ of Japan. II.***

By

**N. Hiratsuka.**

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**IV. Pucciniastrum Agrimoniae** (DC.)

*Plate II. (Fig. 1–6.)*

Uredospores.—Sori pustuliform, scattered in groups, hypophyllous, orange-yellow, pseudoperidia hemispherical, thin willed, with insignificant ostiole at the top; spores roundish, elliptical or somewhat elongated, 15–24 μ long, 12–16 μ broad, finely echinulate, contents orange color. (Fig. 1.)

Teleutospores.—Sori hypophyllous, dark-brown, diffused, forming irregular patches; spores intercellular, spherical, oblong or wedge shaped, 18–30 μ long, 15–30 μ broad, divided into two or four daughter spores by vertical septum; membrane chestnut-brown, Contents colorless. (Fig. 2–6.)


Sapporo, Prov. Ishikari (Miyabe, Y. Takahashi, Hiratsuka); Hakodate, Prov. Oshima (Y. Takahashi, Hiratsuka); Rishiri, Prov. Kitami (Miyabe); Monbetsu, Prov. Iburi (Miyabe); Saruru, Prov. Hitaka (Y. Tokubuchi); Hirosaki, Prov. Rikoku (Hiratsuka); Togatta, Prov. Iwaki (Miyabe); Iwade, Prov. Rikuchiu (Y. Takahashi); Hachiöji, Prov. Musashi (Miyabe).

* The plate will appear in the next number.
Remarks.—This species which is also common in Europe and North America, was described as *Uredo Agrimonie (DC.*) by Schröeter,\(^1\) its teleutospore stage being unknown for a long time.

In 1890 Dietel\(^2\) found the teleutospores of this species on the specimens of *Agrimonia pilosa* Collected in Siberia and also on those of *Agrimonia Eupatoria* Collected in Iowa (North America). According to him, the teleutospores are formed in the epidermal cells on the under surface of the leaf: that is, they are intracellular. He considered it to belong to the genus *Thecopsora* and applied the name of *Thecopsora Agrimonie (DC.) Dietel*.

In our country also, the uredo stage of this fungus is commonly met with wherever the host plant is found. Fortunately, I have found its teleutospores, during my study, in the spring of 1896, in the old specimens collected by Prof. Miyabe and myself near Sapporo; and also in those collected later in the vicinity of Hirosaki.

In our specimens, the teleutospores are formed under the epidermal layer on the under surface of the leaf, and never in the cell cavities as was stated by Dietel. The mode of the formation of the teleutospores according to my observation is as follows:—

The hyphae traversing between the mesophyll-cells of the leaf, make a vigorous growth between the epidermis and the underlying parenchyma cells. The tips of the hyphal branches gradually swell up (Fig. 2), and develop into the unicellular mother teleutospores, which by successive cell divisions by longitudinal septa, many smaller daughter spores are formed. (Fig. 3, 4.). Their size and shape vary according to the condition of nutrition and the space allowed for them. (Fig. 5, 6.).

Other morphological characters of the teleutospores agree well with those described by Dietel. From the place of the formation of the teleutospores, it is evident, that the fungus under consideration must be placed under the genus *Pucciniastrom*. In regard to the uredo-stage of the fungus, our specimens agree well with the descriptions by both Schröeter and Dietel. As Dietel especially remarked in his paper already alluded to, the uredospores are formed singly upon the basidia and never in chains as in the *Caeoma.*

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2) P. Dietel, “Beschreibung der Teleutosporenform von Uredo Agrimonie (DC.),” Hedwigia Bd. 29, 1890, p. 152.

* I was informed by Prof. Miyabe, when my note was ready for press, that Dietel (in “Uredineae brasilienses a cl. E. Ule lecta” in Hedwigia Bd. XXXVI, 1897, p. 33) enumerated the present species under the name of *Pucciniastrom Agrimonie (DC.*) without any remarks.
V. Pucciniastrum Styracinum sp. nov.

(Fig. 7–13.)

Uredospores.—Sori hypophyllous, small, round, scattered, orange-yellow pseudoperidia hemispherical, persistent, with ostiole at the top; spores roundish, ovate or oblong, 19–26 μ long, 14–15 μ broad, usually 22 × 15 μ, echinulate, contents orange color. (Fig. 7–9.)

Teleutospores.—Sori mostly hypophyllous, yellowish-brown; spores intercellular, roundish or oblong, 20–30 μ long, 11–17 μ broad, divided in various ways into many smaller daughter cells; contents light yellowish orange, membrane colorless. (Fig. 10–13.)


Remarks.—The leaves attacked by this fungus show on their upper surface light-yellow discoloration, but later when the teleutospores are formed, they become dark-brown to black. On the under surface just opposite to these discolored spots, small uredosori with orange colored uredospores are developed. (Fig. 7–8.)

Among the uredosori there may be found a small number of clavate paraphyses-like sterile cells, mixed with the uredospores; and rarely some of these cells have orange-yellow contents characteristic to the uredospores. (Fig. 9.)

As to the morphological characters of the uredo, they are analogous to those of Pucciniastrum Tiliae, Miyabe already alluded to in the previous paper.3)

The teleutospores are formed on both surfaces of the leaf; on the under surface, they are formed intercellulary in groups just under the epidermis separating it from the underlying parenchyma cells. (Fig. 10.) While on the upper surface, on the contrary, mostly single mother teleutospore is formed between the palisade cells pressing them aside to both sides causing there-by dark-brown discoloration of the cells; the epidermis remains in the normal position fixed to the palisade cells. (Fig. 11.) The teleutospores are variable in size and shape, being divided into many daughter cells either by longitudinal or horizontal septa. (Fig. 12.) The germination of the teleutospores has not yet been observed.

VI. Pucciniastrum Miyabeannum** sp. nov.

Uredospores.—Sori hypophyllous, minute, scattered, pseudoperidia hemispherical, persistent, ostiole minute with no projections, spores round, ovate or oblong, echinulate, 18–24 μ long, 12–15 μ broad, commonly 18 × 12 μ, often as large as 24 × 15 μ, Contents orange-yellow.

Teleutospores.—Sori mostly hypophyllous, insignificant, formed under the epidermis; spores oblong or ovate, 15–24 μ long, 15–20 μ broad, divided into many smaller daughter spores, mostly by longitudinal septum; contents orange color, membrane colorless.

Hab. On Viburnum furcatum Bl. ( Viburnum ). September to October.

Botanic Garden, Sapporo (Hiratsuka, Miyabe, G. Yamada); Moiwasan, near Sapporo (G. Yamada).

Remarks.—This species is not so common as those species already mentioned.

Uredospores are formed on the under surface of the leaf, covered by a hemispherical, somewhat depressed pseudoperidia which are much smaller than those of Pucciniastrum Styracinum sp. nov. The ostiole is inconspicuous with no projections; paraphyses are absent; but rarely a few sterile cells which morphologically may correspond to the paraphyses may be found.

Teleutospores are formed intercellularly under the epidermis on the under surface of the leaf; but rarely they are also formed singly between the upper palisade cells, as has already been remarked in the case of P. Styracinum. (Fig. 11.) Sometimes the teleutospores are formed among the uredosori as in the case of P. Tiliae.

Other morphological characters of the species are quite similar to P. Tiliae and P. Styracinum already described and it is unnecessary to repeat them here.

Hirosaki, Prov. Rikuoku,
March 1898

EXPLANATION OF FIGURES IN PLATE II.

IV. Pucciniastrum Agrimoniae (DC.) Dietel.

Fig. 1, uredospores; Fig. 2, vertical section of the leaf showing the development of the teleutospores, epidermis ep., stomata sto., teleutospores

** Dedicated to my most honoured teacher, Prof. Dr. K. Miyabe of Sapporo Agricultural College, Japan.
tels., parenchyma cells pa., hyphae Hy.; Fig. 3, and Fig. 4, the same more advanced in its development; Fig. 5, teleutospores; Fig. 6, optical section of teleutospores.

**V. Pucciniastrum Styracinum sp. nov.**

Fig. 7, Vertical median section of uredosorus showing pseudoperidium pe., ostiole mo., paraphyses pa., uredospores sp., epidermis of the host ep., parenchyma cells par.; Fig. 8, uredospores; Fig. 9, section of uredosorus showing a part of the hymenium with paraphyses-like cells pa., and teleutospore-like cells containing colored contents pa'; Fig. 10, vertical section of the teleulosorus on the under surface of the leaf, epidermis ep., teleutospores tels., parenchyma cells par.; Fig. 11, the same on the upper surface, palisade cells pa.; Fig. 12, teleutospores; Fig. 13, optical section of teleutospores.

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**List of Plants collected in Mt. Togakushi and its Vicinities.**

By


(Continued from p. 25.)

**Compositae.**